REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD ANAESTHESIOLOGY

Course Code 201

(2016-17 Academic year onwards)

2016

2. COURSE CONTENTS

2.1 Title of course:

M.D. Anaesthesiology

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.

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- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Year wise training schedule:-

<u>First year</u>

- Basic sciences related to Anaesthesiology
- Basic knowledge of Anaesthesia & resuscitation
- Setting up of operation theatre & critical care unit
- Basics of computer, Internet, biostatistics, research methodology
- Ethical principles, Communication skills
- Medico legal aspects
- Research methodology
- Choosing thesis topic, submission of synopsis, collection of literature, conduct of pilot study
- Basic skills in CPCR, simple anaesthetic procedures, perioperative care & ICU
- management
- Assist senior anaesthesiologist in major & complicated procedures
- Active participation of topic presentations & departmental academic activities.

<u>Second year</u>

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- Thorough knowledge of scientific basis of Anaesthesia, critical care, resuscitation & pain management.
- Knowledge about allied specialties and its implications in anaesthesia.
- Setting up of operation theatre, monitors & ventilators
- Anesthetising common cases independently
- Identifying problems which require help of senior personnel
- Detecting & managing perioperative problems
- Case presentations, seminars & journal presentations
- Attending CME/conference & presentation of scientific paper
- Thesis work, periodic reviews with interaction with guide. Preparation of Manuscripts
- Speciality training of 2 weeks each in Cardiology, Pulmonology
- 1 month training in Pain & Palliative Medicine
- 1 Month training in Cardiac Anaesthesia

Third year

- Well versed with knowledge of anaesthesiology & allied specialities
- Knowledge regarding recent advances in the subject
- Independent decision making regarding plan of anaesthesia & critical care management
- Competent in basic pain therapy & palliative care
- Help senior faculties in complicated procedures & resuscitation
- Leadership role in critical care & resuscitation team
- Good teaching & communication skills
- Skill in specialized procedures
- Complete thesis work

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As in 2.10

The concept of healthcare counselling shall be incorporated in the relevant areas.

2.7 Total number of hours

As mentioned in clause 2.10.

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2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

Learning Activity

Every student shall actively participate in all the clinical, academic & teaching activities in the department. Periodic appraisal of both theory & clinical skills are to be done every 6 months by the senior faculty for which at least 50% marks are needed for appearing the final examination. Also the candidate should have at least 80% attendance in the clinical & academic activities of each year for appearing the examination.

The following teaching activities are recommended:-

- Topic presentations
- Subject seminars
- Multidisciplinary symposiums
- Journal clubs
- Case presentations
- Problem oriented case discussions
- Morbidity & mortality & Clinicopathology correlation meetings
- Critical Evaluation of complications
- Inter departmental discussions
- Teaching skill development
- Research oriented training
- CME programmes & conferences (at least one participation / presentation by the candidate)
- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.
- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in

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consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

▪ The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

▪ Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

• The record books shall be checked and assessed by the faculty members imparting the training, monthly.

• During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

• The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

• Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
• All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

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1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.

2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.

3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Dissertation should be submitted six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course.

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Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

2.10 Content of each subject in each year

SYLLABUS

This is intended to guide only, and is not comprehensive. Newer developments in the specialty will be included from time to time.

- History of Anaesthesiology
- Basic sciences related to Anaesthesiology (Anatomy, Physiology, Pharmacology, Microbiology, Pathology, and Genetics)
- Medicine applied to Anaesthesiology
- Physics related to Anaesthesiology
- Biostatistics, research methodology
- Evidence based Medicine in Anaesthesiology
- Computer basics, internet
- Medical Record keeping & audit
- Uptake and distribution of Anaesthetic gases
- Equipments used in anaesthesia
- Medical gas plant & pipeline system
- Drugs & Gases used in Anaesthesia
- Medico legal aspects of Anaesthesia
- Pre Anaesthetic evaluation, preparation & Perioperative care
- General Anaesthesia including Endotracheal Anaesthesia
- Regional Anaesthesia
- Local Anaesthesia & Nerve blocks
- Intravenous Anaesthesia
- Outpatient Anaesthesia
- Obstetric analgesia
- Accidents, complications & sequlae of Anaesthesia
- Anaesthesia outside operation room
- Acid Base balance
- Fluid & Electrolyte balance
- Blood & blood products

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- Airway management & resuscitation
- Cardiopulmonary resuscitation
- Critical care management
- Trauma management
- Oxygen & respiratory therapy
- Sterilization & care of operation theatre & equipments
- Safety of operation theatre environment
- Acute & chronic pain therapy
- Palliative care
- Disaster management
- Communication & Teaching skills
- Updating of recent advances in Anaesthesiology
- Anaesthetic management of Organ Transplantation
- Scope of Modern Anaesthetic practice
- Teaching Anaesthesia
- Sub specialty Anaesthetic management
- Ancilliary problems and responsibilities

Skills to be acquired

- Basic Graduate skills:
- Insertion of IV lines
- Insertion of Nasogastric tube
- Monitoring vital signs
- Anaesthesia Skills:
- Basic airway management
- Difficuly airway management
- Orotracheal / Nasotracheal intubation
- Airway equipments
- Local anaesthesia
- Regional Anaesthesia
- Neuraxial blockade
- Intravenous Regional Anaesthesia
- Total intravenous Anaesthesia
- Monitored Anaesthesia Care
- General Anaesthesia
- Perioperative monitoring
- Critical Care procedures:
- Airway Management (Cricothyrotomy, tracheostomy)
- Fibreoptic bronchoscopy
- Arterial cannulation

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- Central venous cannulation
- Pulmonary artery catheterisatiion
- Sampling & interpretation of ABG
- Fluid & Electrolyte management
- Ventilatory care
- Intercostal drainage
- Intensive Care Therapy
- Ultrasound and echo in ICU
- Emergency room procedures:
- Management of airway obstruction
- Cardiopulmonary resuscitation (BLS & ACLS)
- Management of cardiac failure
- Management of respiratory failure
- Management of shock
- Pain Therapy:
- Common modalities of acute & chronic pain therapy
- Perioperative pain management
- Labour analgesia
- TENS
- PCA
- Common nerve blocks
- Neurolytic & nerve ablation procedures
- Psychological aspects of pain therapy
- Palliative care

2.11 No: of hours per subject

As given under 2.10.

2.12 Practical training given

As given under clause 2.10.

2.13 Records

Relevant records are to be maintained.

2.14 Dissertation: As per dissertation Regulations of KUHS

RESEARCH

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Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Speciality training of 2 weeks each in Cardiology, Pulmonology, 1 month in Pain & Palliative medicine. 1 Month training in Cardiac Anaesthesia

2.16 Project work to be done if any

As stipulated by the Head of Department from time to time.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Present in clause 2.19.

2.19 Reference books

- Anatomy for Anaesthetists (Ellis)
- Drugs & Anaesthesia (Wood)
- Physics for the Anaesthetist (Muschin & Mcintosh)
- Miller's Anaesthesia
- A practice of Anaesthesia (Wylie-Churchill-Davidson)

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- Clinical Anaesthesia (Barash, Cullen, Stoelting)
- Anaesthesia & Co-existing diseases (Stoelting)
- Clinical Anaesthesiology (Morgan)
- Understanding Anaesthesia equipments (Dorsch & Dorsch)
- Kaplan's Cardiac Anaestheia
- Thoracic Anaesthesia (Kaplan)
- Obstetric Anaesthesia (Chestnut)
- Pediatric Anaesthesia (Gregory)
- Neurosurgical Anaesthesia (Hunter)
- Benumof's Airway management
- Textbook of Pain (Cusine)
- Anaesthesia & Intensive care (Yeatis)
- Acute Pain (Raymond Sinatra)
- Medicine for Anaesthetists (Vickers)
- Monitoring in Anaesthesia & critical care medicine (Casey D Blitt)
- Management of Trauma ((Wilson & Walt)
- Textbook of Critical care (Fink)

2.20 Journals

- Indian journal of Anaesthesia
- Anaesthesia Analgesia
- British journal of anaesthesia
- Recent advances in Anaesthesiology
- Canadian journal of anaesthesia
- Acta Anaesthesia Scandinavia
- Indian journal of palliative care
- Indian journal of Critical care
- Anaesthesia & intensive care medicine
- Journal of Anaesthesiology Clinical pharmacology

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short

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review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATION

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination).**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the

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Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

- Theory 400 marks (4 Papers 4X100)
- Clinical / Practical 300 marks
- Oral 100 marks

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Practicals: Total 300 marks distributed between one long case (150 marks) & two short cases (100 marks) and one virtual case (50 marks).

Oral: 100 marks for oral examination (80 marks for oral & 20 marks for Log book).

Sl. No.	Subject	Theory	Theory Group	Practical		Practical Group	Total
		University		University	Viva		

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		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

Theory consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

- Paper I – History, Basic Sciences & Equipments
- Paper II – Clinical Anaesthesia in Relation to Basic Specialities
- Paper III – Clinical Anaesthesia in Relation to Subspecialities
- Paper IV – Recent Advances, Intensive Care & Pain Medicine

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg. No. :……**

MD Degree Examinations in Anaesthesiology

Paper I – History, Basic Sciences & Equipments

Time: 3 hrs **Max marks: 100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: (20)

1. Describe the Anatomy of Neuro-Muscular junction. Discuss the physiology of neuromuscular transmission.

What are the types of neuromuscular blockade.

Classify neuromuscular blocking drugs.

How will you monitor neuromuscular transmission peri operatively.

(4+4+4+4+4 =20)

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Short essays: (10x8=80)

2. Flow meter assembly
3. Internal jugular vein cannulation
4. End tidal CO2 monitoring
5. Physiological changes during pregnancy
6.Depth of Anaesthesia
7. Tests of coagulation
8. Renal function tests
9. Magnesium

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QP Code: **Reg. No. :……**

MD Degree Examinations in Anaesthesiology

Paper II – Clinical Anaesthesia in Relation to Basic Specialities

Time: 3 hrs **Max marks: 100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: (20)

1. A 60 year old man with Type 2 Diabetes Mellitus 5 years and Coronary artery disease 1 year is posted for open cholecystectomy. Discuss the preoperative evaluation of the patient. How will you optimize the patient pre-operatively? What is your plan of anaesthetic technique? Discuss the anesthetic management and post-operative care.

(5+5+5+5=20)

Short essays: (10x8=80)

2. Post operative nausea and vomiting
3. Hypothermia
4. Anaesthetic concerns of geriatric patients
5. Peri operative glycemic control
6. Desflurane
7. Supraglottic airway devices
8. Ankle block
9. Pulmonary oedema

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QP Code: **Reg. No. :……**

MD Degree Examinations in Anaesthesiology

Paper III – Clinical Anaesthesia in Relation to Subspecialities

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: (20)

1. A 30 year old patient with acoustic neuroma is posted for posterior fossa surgery.

Discuss the Pre-operative evaluation and preparation. How will you position the patient for the surgery. Describe the intra-operative complications and their management.

(5+5+10=20)

Short essays: (10x8=80)

2. Noradrenaline
3. Complications and treatment of trans-urethral resection of prostate.
4. Cardioplegia
5. Anaesthesia for rigid bronchoscopy for a 4 year old child with Foreign body Bronchus.

Synthetic functions of liver

7. Paediatric epidural anaesthesia.
8. Renal replacement therapy.
9. Brain death.

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QP Code: **Reg. No. :……**

MD Degree Examinations in Anaesthesiology

Paper IV – Recent Advances, Intensive Care & Pain Medicine

Time: 3 hrs **Max marks:100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

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Essays: (20)

1. A 50 year old patient with Carcinoma head of pancreas is admitted with severe pain.

What are the methods to provide pain relief for this patient. Describe the technique of coeliac plexus block. Enumerate the complications of the procedure.

(7+7+6 =20)

Short essays: (10x8=80)

2. Infection control in ICU.
3. Labor analgesia – recent advances.
4. Deep vein thrombosis-Prophylaxis and management
5. Dexmeditomidine
6. Multicasualty triaging.
7. Environmental hazards in Operation theatres
8. Enteral nutrition in ICU Patients.
9. PEEP

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

Clinical / Practical and Oral

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

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3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

100 marks for oral examination (80 marks for oral & 20 marks for Log book).

4. INTERNSHIP

Not applicable for P.G. Medical degree courses

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerned Institution

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD ANATOMY

Course Code 202

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. ANATOMY

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

I. <u>Outline of the course contents</u>

<u>Theory</u>

1. History of Anatomy
2. General Anatomy
3. Elements of Anatomy
4. Gross Human Anatomy including Cross Sectional Anatomy and Applied Anatomy.
5. Principles of Microscopy and Histological techniques.
6. General and Systemic Histology.
7. General and Systemic Embryology including Growth, Development and Teratology, assisted reproductive methods.

8. Neuroanatomy.
9. Surface Anatomy.
10. Radiological Anatomy including Principles of newer techniques and Interpretation of CT scan, Sonography and MRI.
11. Human genetics.
12. Evolution.
13. Principles of Physical Anthropology.
14. Museum techniques, Embalming techniques including Medicolegal aspects, and knowledge of Anatomy Act.
15. Medical ethics.
16. Recent Advances in Anatomy.

Practical Schedule

1. During the course – the PG students should dissect the entire human cadaver.
2. They should embalm 5 bodies and maintain the record of embalming work done.
3. They should prepare and mount at least 5 museum specimens during their course.
4. In Histology section

- Collection of tissues, fixing, block making, section cutting; use of different types of microtomes and preparation of general and systemic slides.
- Heamatoxylin& Eosin-

  (i) Preparation of stains.
  (ii) Staining techniques.
  (iii) Preparation of Microscopic sections using 3(Heamatoxylin& Eosin) and 3 special stains.

- Knowledge of special staining techniques like Silver Nitrate, PAS staining, Osmium tetroxide, Van Gieson etc.
- Embryo (chick embryo) mounting and serial sections of embryo – should be taken, stained with Haematoxylin & Eosin.
- Knowledge of light microscope and electron microscope.
- Detailed microscopic study of all the tissues (General and Systemic Slides).

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.. The duration of course of Diploma holders

pursuing MD/MS in the same speciality shall be two years. The course should be successfully completed within double the duration of the stipulated period of the course.

2.6 Syllabus

Present in clause 2.10

The concept of healthcare counselling shall be incorporated in the relevant areas.

2.7 Total number of hours

Present in clause 2.10

2.8 Branches if any with definition

Not applicable

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Method of Training

- The Postgraduate students shall attend all the Undergraduate Theory and Practical Classes regularly.
- They shall take part in teaching undergraduate students in gross anatomy, histology tutorials, group discussions and seminars.
- Rotation postings of PG students shall be made during the II and III years of the course as follows.

1. General Surgery: 4 weeks
2. Orthopaedics: 2 weeks II year
3. Radiodiagnosis: 2 weeks
4. General Medicine: 2 weeks
5. Paediatrics: 2 weeks
6. Obstetrics and Gynaecology: 2 weeks III year
7. Genetics: 2 weeks

At the end of the posting, a certificate has to be obtained from the concerned heads of the departments for satisfactory learning.

<u>Seminars & Journal Review Meeting</u>

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work done in Histology and Gross Anatomy with an emphasis on Cross sectional Anatomy has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

SYLLABUS FOR THEORY

A Postgraduate should have fairly a good knowledge of all the topics given in the 'Outline of the course contents' above. Therefore, formulating a strict syllabus for the theory and practical examination of medical Postgraduate degree course does not necessarily arise. However, the topics detailed below may be taken as a guide while preparing for the examination.

1. GENERAL ANATOMY

Epithelium: Classification, Simple and Compound epithelium, Glandular and Sensory epithelium cell junction, Connective tissue cells and fibres.
Cartilage – Structure &Types
Bone: Types, Periosteum, cells and matrix. Ossification–Vascularization, regeneration
Vascular system, lymphatic system, integumentary system, nervous system.
Joints: General classification with emphasis to structure and types of synovial joint and movements.

2. GENERAL EMBRYOLOGY

Introduction, Oogenesis, Ovarian cycle, Male reproductive system, Spermatogenesis, Fertilization and implantation; Bilaminar and Trilaminar germ discs, Intraembryonic mesoderm,

Folding of the embryo, Formation of Placenta, Circulation of placenta, Foetal membrane, Twinning, Teratology, evolution. Recent advances

3. UPPER LIMB

Bones, Fascia, Venous and lymphatic drainage, Cutaneous innervation and myotomes (Motor innervation) of Upper limb; Surface anatomy and the structures in the Pectoral and scapular regions; Mammary gland with special emphasis to its lymphatic drainage; Blood vessels, nerves (Brachial plexus) and lymph nodes in the axilla and their clinical significance; Muscles, blood vessels and nerves of arm, forearm and hand; Cubital fossa, fascia and compartments of palm and their clinical significance; all joints of upper extremity.

4. LOWER LIMB

Bones, Fascia, Venous and lymphatic drainage and their clinical significance, Cutaneous innervation and myotomes (Motor innervation) of Lower limb; Special emphasis to Posture and Gait; Structures in the gluteal region and their clinical significance. Structures in all three compartments of thigh and leg; Poplitea fossa;. Muscles and neurovascular structures in the sole of foot; Arches of foot and their applied anatomy; All joints of lower extremity. Development of limbs musculature & Skeleton

5. THORAX

Skeleton, joints, neurovascular structures, muscles and movements of thoracic wall; thoracic apertures; Pleura, lungs and tracheobronchial tree and their surface marking and applied importance; Boundaries and contents of mediastinum and applied anatomy. Pericardium, Chambers and blood supply of heart and their applied importance. Surface marking of borders and valves of heart and their relation to the areas of auscultation. Development of Heart and its anomalies. Arch of aorta, SVC, IVC, thoracic part of oesophagus, thoracic duct and azygos system of veins; Development of major blood vessels from aortic arches and their associated anomalies. Development of respiratory system

6. GENETICS

Genetic basis of congenital disorders, Structure of chromosome, Tissue culture and karyotyping, Abnormalities of Chromosomes, Chromosomal aberrations, abnormalities of genes Genetic counseling, Pedigree and Modes of inheritance. Prenatal diagnosis

7. HEAD AND NECK

Scalp; Face and its development; Pituitary gland, Cranial meninges and the dural venous sinuses; Eyelid and lacrimal apparatus; Nerves and vasculature of orbit; Extraocular muscles of

Eyeball; Parasympathetic ganglia, Muscles of mastication, T.M. joint, Nasal cavity and Paranasal air sinuses. External, Middle and Internal ear. Cervical fascia, Pharynx, Larynx, Thyroid gland, its development and applied significance; Cranial nerves, sympathetic ganglia in the neck; Development of branchial arches, face, palate, tongue, eye.

8. BRAIN

Spinal cord – external features, blood supply and development. Medulla oblongata, Superficial & Deep blood supply of brain and their applied importance; Midbrain, Pons, Cerebellum; Ventricles of brain and subarachnoid cisterns; Sulci, Gyri and functional areas of the cerebrum. White matter of cerebrum – Internal capsule; Basal nuclei, Optic pathway, Thalamus; Development of brain and Functional columns. Ascending & descending tracts spinal cord and brain stem.

9. ABDOMEN AND PELVIS

Anterior abdominal wall – muscles, blood vessels and nerves. Incisions on the anterior abdominal wall, Rectus sheath and contents; Inguinal canal, Testis and spermatic cord; Peritoneum, its reflections and applied anatomy. Development of GIT – Rotation of midgut and its associated anomalies; Stomach, Duodenum, Colon, Pancreas, Spleen, Portal Vein, Liver & Gallbladder, Extrahepatic biliary apparatus; Diaphragm, its development and associated anomalies; Uterus, Ovary, Prostate; Rectum and Anal canal and their applied importance; Pelvic floor, Pelvic vessels, nerves and lymph nodes; Development of Urogenital system; Kidney, Suprarenal gland, Ureters, Urinary bladder; Development of external genitalia.

10. PERINEUM

Ischiorectal fossa, Perineal pouches, Perineal body, Pudendal canal, Pudendal Nerve.

11. Systemic Histology

12. Techniques in Histology, Museum & embalming techniques

SYLLABUS – PRACTICALS

(During the course, the PG students should dissect the entire human cadaver.)

1. **UPPER LIMB**

Introduction, Pectoral region and axilla, Cutaneous nerves and vessels The brachial plexus, The dissection of back, The free upper Limb, Lymph vessels and lymph nodes of upper limb, Cutaneous nerves of upper limb and deep fascia of upper limb; The shoulder - movements of the limb at the shoulder, the shoulder joint. The arm – anterior compartment, Posterior compartment of arm. The forearm and hand, Palmaraponeurosis, Superficial palmar arch, Flexor retinaculum, Flexor tendons, The arteries and nerves of the Flexor compartment of the fore arm , Muscles of the front of the forearm and hand , Fascial compartments of the palm, The extensor compartment of the forearm and hand, Extensor tendons of the finger. Joints of the upper limb – elbow joint, wrist joint, radio-ulnar joints, intercarpal, metacarpal and intermetacarpal joint.

2. LOWER LIMB

Sole of the foot, 1st and 2nd layer, 3rd and 4th layers, 5th and 6th layers, Front of thigh, Adductor canal, Medial side of thigh, Gluteal region Popliteal fossa, back of thigh, Hip joint, front of leg and dorsum of foot, Superficial dissection Anterior compartment of leg, Lateral and medial compartments of leg, Back of leg, Ankle, Tibio – fibular and other joints, revision.

3. THORAX

Introduction: Walls of thorax, Cavity of thorax Mediastinum, Root of lungs Autonomic nervous system The lungs, Anterior Mediastinum, Middle mediastinum Surface anatomy of the heart, Chamber of heart, Right atrium, Right ventricle, Left ventricle, Aorta, Superior mediastinum, Arch of aorta, Left atrium, Conducting system of heart, Thoracic part of aorta. Vagus, Oesophagus, Thoracic duct, Posterior intercostals vessels, Joints of thorax, Revision.

4. HEAD AND NECK

The superficial dissection of face, Cervical vertebrae, skull, the temple and the infratemporal region. Nerves and vessels of scalp; Superficial temporal region. The side of the neck, the anterior and posterior triangles of neck; the median region of the front of neck; subdivisions of anterior triangle.

The cranial cavity: Structures seen after removal of brain, Cranial fossae

Deep dissection of the neck: Thyroid & Parathyroid glands , trachea and oesophagus, Brachio-cephalic trunk, Subclavian artery, Branches of subclavian artery Brachio cephalic veins, Thoracic duct, Vertical neurovascular bundles of the neck, Neurovascular bundles of the neck, at the base of the neck and at the base of the skull. Nerves of the neck. Scalene muscles, Cervical fascia, Lymph nodes and lymph vessels of the head and neck, The prevertebral region.

Deeper dissection of the face: Nerves of the face Structures of the cheek and lips The eyelids, the lacrimal apparatus. The orbits, the structures in the orbit. The parotid region, the parotid gland. The temporal and infratemporal region Temporal fascia, Temporalis muscle. The superficial contents of the infratemporal fossa Temporomandibular joint, The deeper contents of the infratemporal fossa. The submandibular gland, Mylohyoid muscle, Hyoglossus, Stylohyoid ligament. The mouth and pharynx , The cavity of the nose, The larynx, The tongue The organs of hearing and equilibration The eye ball The contents of the vertebral canal, the joints of the neck.

Brain:

Introduction: The membranes of the brain- meninges Blood vessels of the brain The Cerebellum, The fourth ventricle, The midbrain, pons, medulla The cerebrum , the white matter of the cerebrum Ventricles of brain and the choroid fissure The thalami and the optic tracts The deep dissection of the hemisphere The deep nuclei of the telencephalon The nuclei and connections of the thalamus, Cerebral topography.

5. ABDOMEN

Anterior abdominal wall muscles, inguinal canal. Nerves and vessels of anterior abdominal wall Male external genital organs Dissection of the loin

Abdominal cavity

Shape, Boundaries, Divisions of peritoneal cavity Ligaments of liver, Spleen Oesophagus, Vagal trunk, stomach, Mesentery Superior mesenteric artery, Inferior mesenteric artery, Arterial anastomosis on GI tract, Structure of small intestine, Large intestine, Duodenum, Portal vein, Ducts of liver, Pancreas, Liver, Gall bladder, Cystic duct, Abdominal structures in contact with diaphragm, Autonomic nervous system, supra renal glands, The kidneys , Abdominal part of ureter The diaphragm, The posterior abdominal wall muscles The inferior venacava Lymph nodes of posterior abdominal wall the azygos and hemiazygos veins the muscles of posterior abdominal wall, The nerves of posterior abdominal wall The pelvic viscera, ovaries, uterine tubes Pelvic part of ureters Urinary bladder, Internal surface of urinary bladder Ductus deferens, Prostate, Male urethra Uterus, Rectum, Anal canal Vessels of lesser pelvis, Nerves of lesser pelvis, Obturator nerve, Autonomic nerves The muscles of lesser pelvis joints of pelvis

Perineum Ischiorectal fossa, Perineal pouches Perineal body, Pudendal canal

6. HISTOLOGY

Epithelium Connective tissue Cartilage- Hyaline, elastic, fibro cartilage Bone – C.S , L.S Muscles – skeletal , smooth, cardiac Nervous tissue – neuron, nerve fibre, sciatic and optic nerves, sympathetic spinal ganglia.
Blood vessel – Large and medium sized artery, large medium sized vein.
Lymphoid tissue – lymph node, spleen, thymus, palatine tonsil. Skin – thick, thin Mammary gland – active, inactive Placenta, umbilical cord Respiratory system – trachea, lungs Nervous system – spinal cord, cerebrum, cerebellum, cornea, retina Endocrine system – thyroid parathyroid, supra spinal, pituitary Excretory system – kidney, ureter, urinary bladder, Reproductive system Male: Testis, epididymis, vas deferens, prostate
Female: Ovary, uterus, - proliferative and secretory, Fallopian tube
Digestive system – Salivary glands- mucous, serous & mixed, pancreas, liver, gall bladder, tongue, oesophagus. Stomach – fundus, pylorus, duodenum, jejunum, ileum, large intestine, appendix. Chromosome spread, staining, histology techniques, embryology & neurology sections

2.11 No: of hours per subject

Present in 2.10

2.12 Practical training

Present in clause 2.10

2.13 Records

Present in clause 2.21.

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher as a guide. All Post Graduate students should should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Present in clause 2.10

2.16 Project work to be done if any

As stipulated by the Head of Department from time to time.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Gross Anatomy

- Susan Standring - Gray's, Anatomy - 39th Edition, Elsevier 2005.
- Richard L. Drake- Gray's Anatomy for Students – Churchill Livingstone, Elsevier – 2005
- G. J. Romanes -Cunningham's manual of Practical Anatomy – 3 volumes, Oxford Medical Publications
- Keith & Moore - Clinically Oriented Anatomy - 3rd Edition, 1992 Williams & Wilkins.
- Snell.S.Richard- Clinical Anatomy by Regions - 8th Edition, Lippincott Williams and Willkins, 2008.
- Gosling, Harris - Human Anatomy, 4th Edition, Mosby - 2002
- Kulkarni- Clinical Anatomy for Students, First edition, Jaypee Brothers - 2006

- Indirbir Singh - Textbook of Anatomy – 4th Edition, Jaypee Brothers – 2006
- McMinn R.M.H. Last's, Anatomy - 8th, Edition, ELBS, 1990.
- BasmajainV.John and SloneckerE.Charles, Grants Method of Anatomy, 11th Edition, Williams and Wilkins 1989.
- Hollinshed W. Henry, Anatomy for Surgeons - 411 Edition, Harper and Raw Publishers, 1985.
- DUPLESSIS and Gadecker Lee Mcgregor's, Synopsis of Surgical Anatomy –

12th Edition, K.M.Varghese Company, 1986.

- Grant Boileau. J.C., An Atlas of Anatomy - 5th Edition, Williams and Willkins -

1984.

- Graggs Hall E.C.B, Anatomy as a basis for Clinical Medicine - 2"d Edition. Williams and Williams, 1990.
- McMinn M. H. Robert, McMinn'sFunctional and Clinical Anatomy -1st Edition, Mosby Publications, 1995.
- A. K. Datta, TextBook of Anatomy Vol. I, II & III - 4th, Edition, 1997 Current Books International.
- Le Gross Clark, Tissues of the Body - 6thEdition, 1980 Oxford University Press.
- Vishram Singh- Clinical & Surgical Anatomy, 2nd Edition, Elsevier – 2007
- Surface and Radiological Anatomy – A. Halim and A.C.Das

Histology

- Cormac K. H.D avid, Ham's Text Book of Histology - 9th Edition, J.B.

Lippincott Company, 1987.

- Copenhaver M. Wilfred et.al, Bailey's text book of Histology, 17th, Edition, William and Wilkins, 1978.
- Difiore's. - Atlas of Human Histology with functional correlations - 11th Edition, Lippincott Williams & Wilkins. First Indian Reprint - 2008
- Janqueira.C.Luisetal, Basic Histology - 2nd Edition, Large Medical Publication,

1971.

- Drury R.A.B., Wallington E.A. Canton's, Histological Technique - 5th Edition, Oxford University, Preces, 1980.
- Cullings, Histological Technique - 3rd Edition, 1994 Butterworths.
- John D Bancroft, Manual of Histological Technique - Ist Edition, 1984 Churchil

Livingstrone.

- Michael H Ross, Histology - A Text & Atlas - 3rd Edition, 1985 Williams &

Wilkins.

- Bloom and Fawcett, Text Book of Histology. W.**B.Saunder's Company.**

Embryology

- Hamilton W.J. and Mossman H.W., Human Embryology - 4th Edition, Williams and Wilkins Company, 1972.
- Langman's Medical Embryology T W Sadur – 9th edition 2004, Lippincott,

- Willliams&Willkins.
  - Moore Persaud - Developing Human – Clinically Oriented Embryology –
- Elsevier –7th Edition, First Indian Reprint -2003
  - A.K.Datta, Essentials of Human Embryology – 2nd Edition, Current Books
- International, 1991.
  - Larsen, Human Embryology - 2nd Edition, 1997, Churchill Livingstone.
  - Inderbir Singh- Human Embryology – 8th Edition, 2007

- **<u>Neuroanatomy</u>**

  - Everett N.B., Functional Neuroanatomy, 6th Edition, Lee and Febigger, 1971.
  - Snell. S. Richard- Clinical Neuroanatomy for Medical Students, - 7th Edition, Lippincott Williams &Willkins -2009.
  - Chusid. G. Joseph, Correlative Neuroanatomy and Functional Neurology - 16th Edition, Lange Medical Publication, 1976.
  - A. K. Datta, Neuroanatomy, - 1stEdition, Current Books International, 1997.
  - Parent Andre, Carpenter's Neuroanatomy- 9th Edition, Williams and Wilkins, 1996.
  - Inderbir Singh - Neuroanatomy- 8th Edition, Jaypee Brothers Medical Publications - 2009.
  - Vishram Singh – Neuroanatomy- Elsevier – 2009

- **<u>Human Genetics / Medical Genetics</u>**

  - Robert F Mueller, Emery's Elements of Medical Genetics - 9th Edition, 1995, Churchill Livingstone.
  - Nora & Frazer, Medical Genetics Principles - 1974 Lee &Gebiger,
- Philadelphia.
  - Friedman, NMS Genetics - 2nd Edition, 1996.
  - Alfred G Kudson Jr., Genetics & Disease - McGraw Hill Book Company
- N.Y.,
  - Thomas D. Gelehrtar, Principles of Medical Genetics - 2nd Edition, 1990 Williams & Wilkins.

- J.M.Conner M A Ferguson Smith - Essentials of Medical Genetics - Blackwell Scientific publications.
- Bhatnagar, Kothari andLopo–Mehta- Essentials of Human Genetics

- **Comparative Anatomy**

  - Banks Histology and Comparative Organology - A Text & Atlas – Edition 1974.
  - Wolstenhome, Taste & Smell in Vertebrates - Edition 1970.
  - Embryogenesis in Mammals CIBA foundation - Edition 1976.
  - George C. Kent, Comparative Anatomy of the Vertebrtes- 3rdEdition, 1983 Mc. Graw Hill Book Company.
  - Romer, Vertbrate Body- 5thEdition, 1978, V.B. Saunders Company.

- **Physical Anthropology**

  - Harrison, Human Biology an introduction to Human Evolution and Growth - 2nd Edition, 1970.
  - Poirier, Fossil Man, 1973.

- **Embalming Techniques**

  - Jayavelu T., Embalming Techniques, Churchill Livingston.
  - Ansari M.C., Embalming.
  - Embalming - Ajmani 1" edition 1998, J.P. Publishers.

- **Museum Techniques**

  - Tompsett RH, Anatomical Techniques.
  - Edwards A Medical Museum Techniques, Oxford University Press.

2.19 Reference books

1. Compendium of recommendations of various committees on Health and Development (1943- 1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry.of Health and Family Welfare, Govt. of India, NirmanBhawan, New Delhi.
2. National Health Policy, Ministry. of Health & Family Welfare, NirmanBhawan, New Delhi, 1983.
3. Santosh Kumar -The elements of Research, writing and editing 1994, Dept. of Urology, JIPMER, Pondicherry.
4. Srinivasa DX et. al, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry.
5. Indian Council of Medical Research, "Policy Statement of Ethical considerations involved in Research on Human Subjects", 1982, I.C.M.R., New Delhi.
6. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
7. Francis C.M, Medical Ethics, J P Publications, 2nd. 2004.
8. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
9. International Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Eng; J Med 1991.
“Content of each subject in each year . Kirkwood B R, Essentials of Medical Statistics, 1st Ed., Oxford: Blackwell Scientific Publications 1988.
11. Mahajan B K. Methods in Bio statistics for medical students, 5th Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.
12. Raveendran, B. Gitanjali, A Practical approach to PG dissertation, New Delhi JP Publications, 1998.

2.20 Journals

1. Journal of Anatomical Society of India.
2. Journal of Anatomy.
3. ActaAnatomica.
4. American Journal of Anatomy.
5. American Journal of Physical Anthropology.
6. Journal of Morphology, Embryology
7. Anatomical Record
8. American Journal of Medical Genetics.
9. Annual Review of Genetics.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of "Content of each subject in each year 0 marks of viva).

3.EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 **Scheme of examination showing maximum marks and minimum marks**

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Theory 400 marks (4 Papers 4X100)

Theory examination: Consists of four papers, each 3hour duration with one structured long essay for 20 marks, and eight short essays carrying ten marks each.

- Paper I – Gross & Applied Anatomy including Surface &Recent advances in Anatomy
- Paper II – Embryology, Genetics, Radiological anatomy and newer imaging techniq
- Paper III –Histology, Anatomical techniques
- Paper IV – Neuro anatomy including embryology and histology of nervous system

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No:**

MD Degree Examinations in Anatomy

(Model Question Paper)

Paper I – Gross Anatomy including Surface &Radiological Anatomy and Newer imaging techniques

Time: 3 hrs Max marks:

• Answer all questions

• **Draw diagrams wherever necessary**

Essay: (20)

1**.** Describe the formation of Brachial plexus and effects of injury at different sites

Short Essays (8x"Content of each subject in each year =80)

2. Visceral space related to neck

3. Unhappy triad of knee joint

4. Lesser sac

5. Arterial supply of heart

6. Subphrenic spaces

7. Stem cell theorapy

8. Pelvic diaphragm

9. Fetal interventional surgeries

****

QP Code: **Reg.No:**

MD Degree Examinations in Anatomy

(Model Question Paper)

Paper II – Embryology, Genetics, Radiology and newer imaging techniques

Time: 3 hrs Max marks:

• **Answer all questions**

• **Draw diagrams wherever necessary**

Essay: (20)

1. Describe the rotation of gut and developmental anomalies in detail

Short Essays (8x"Content of each subject in each year =80)

2. Karyotyping

3. 64 slice CT

4. Twinning

5. Homoeo box genes

6. Intra embryonic mesoderm

7. PET Scanning

8. Development of face

9. Development of interventricular septum

****

QP Code: **Reg.No:**

MD Degree Examinations in Anatomy
(Model Question Paper)
Paper III – Histology, Anatamical techniques
Time: 3 hrs Max marks:

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: (20)

1. Describe the the microscopic Anatomy of resperative system

Short Essays (8x"Content of each subject in each year =80)

2. Microscopic Anatomy of Retina

3. Fixatives

4. Sledge Microtome

5. PAS Staining

6. Connective tissue fibers

7. Embalming for transportation

8. Microscopic Anatomy of Kidney

9. paraffin embedding

****

QP Code: **Reg.No:**

MD Degree Examinations in Anatomy

(Model Question Paper)

Paper IV – Neuro Anatomy including embryology and Histology of nervous system

Time: 3 hrs Max marks:

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: (20)

1. Describe the functional areas of cerebrum in detail

Short Essays (8x"Content of each subject in each year =80)

2. Laminar architecture of grey matter of spinal cord

3. Modern concepts of functional localisation of cerebellum

4. Spinothalamic tracts

5. Corpus striatum

6. Cerebral asymmetry

7. Ventral nucleus of thalamus

8. CPangle tumour

9. Nuroglia

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years' experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

Viva Voce: 100 marks (80 marks for oral & 20 marks for Log book)

4.INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerned Institution

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE

IN MEDICINE

MD BIOCHEMISTRY

Course Code 203

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Biochemistry

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

  At the end of the Post Graduate training in the discipline concerned the student shall be able to;
- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.

- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Present in clause "Content of each subject in each year " of the curriculum.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

Present in clause 2.10

The concept of healthcare counselling shall be incorporated in the relevant areas.

2.7 Total number of hours

Present in clause 2.10

2.8 Branches if any with definition

Not applicable

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of laboratory works assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.

2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.

3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Dissertation should be submitted six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the University.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of theory papers and practicals

THEORY

PAPER I [GENERAL BIOCHEMISTRY, ENZYMES & BIOSTATISTICS]	
1.1.	Cell structure – organelle, cytoskeleton and biomembranes – structure and function
1.2.	Methods of separation and analysis
2.1	Water, pH and buffers, Henderson Hasselbach equation, buffer system, colloids, laws of mass action, surface tension, osmosis, diffusion
2.2	Biochemical techniques: Chromatography, electrophoresis, fluorometry, ultracentrifugation, colorimetry, spectrophotometry, atomic absorption, spectrophotometry, mass spectrometry, nephelometry, turbidimetry, flame photometry,ISE, immunochemistry Radioactive isotopes – their application in clinical diagnosis and biomedical research, measurement of radioactivity, tracer techniques, autoradiography,radioimmunoassay (RIA)
3.1	Enzymes – Classification, mechanism of action, factors affecting enzyme activity
3.2	Inhibition and activation of enzyme activity, regulation of enzyme activity, isoenzymes, clinical enzymology – diagnostic and therapeutic applications
4.1	Chemistry of amino acids and proteins – classification of amino acids, physical and chemical properties of amino acids.
4.2	Structural organization of proteins. Study of protein structure
4.3	Structure – Function – relationship of proteins
4.4	Special proteins – Plasma proteins, immunoglobulin (techniques of detection,

	separation and quantitation)
4.5	Contractile proteins, structural proteins (collagen, elastin, keratin) and functional proteins
4.6	Glycoprotein – Types, functions and formation
4.7	Hemoglobin: Structure of hemoglobin, different types of Hb – Transport of oxygen, CO2- buffering action, Hb variants – hemoglobinopathies and thalassemias, myoglobin
5.1	Chemistry of carbohydrates – classification and biological importance, chemistry and functions of monosaccharides, disaccharides, and polysaccharides including glycosaminoglycans
5.2	Chemistry of lipids – classification and biological importance, chemistry and functions of triglycerides, phospholipids, glycolipids, fatty acids, cholesterol, lipoproteins and prostaglandins
5.3	Purines and pyrimidines – their derivatives – nucleosides, nucleotides, nucleic acids
6.1	Biostatistics: Basic principles of research methodology – Formulation of research hypothesis, study designing, sampling, data analysis and reporting with essential knowledge of statistical analysis.
6.2	Population distributions: Populations and samples-Frequency distributions
6.3	Basic distribution statistics: Measures of central tendencies, measures of variation, confidence intervals and measures of accuracy and precision
6.4	Parametric comparisons of populations : Null hypothesis and statistical significance, two hypothesis, comparison of random variation (precision)-the F test, comparison of means (accuracy or bias)-the t test, ANOVA (one way analysis of variance), testing a sample for outliers using the gap test
6.5	Reference intervals and clinical decision limits: Reference population, reference individuals, reference sample group, reference values, reference distribution, reference limits, reference intervals, Protocol for obtaining reference values and establishing health associated reference intervals, selection of reference intervals, pre analytical and analytical variables
6.6	Analysis of reference values: Statistical methods, confidence intervals, treatment of outlying observations, partitioning of reference values, transference, presentation of reference intervals, intra individual reference intervals, ROC curve (receiver operating characteristic curve
PAPER II [MOLECULAR BIOLOGY, IMMUNOLOGY & CANCER]	
1.1	Structure and functions of nucleic acids, organization of DNA in cells
1.2.	Replication –steps (prokaryotic and eukaryotic), enzymes, fidelity, DNA repair, inhibitors
1.3.	Transcription – (prokaryotic and eukaryotic) different types of RNA polymerases, post transcriptional modifications, inhibitors
1.4	Translation – (prokaryotic and eukaryotic) Steps, factors involved, post translational modifications, inhibitors, protein folding and targeting ; Mutations
1.5	Regulation of gene expression,prokaryotic and eukaryotic Epigenetics

1.6	Cell cycle, cell to cell adhesion, recognition, signaling, growth factors and cytokines
1.7	Apoptosis, Role of mitochondria, mitochondrial DNA, Mitochondrial cytopathies
2.1	Genetic basis of cancer, Oncogenes and oncosuppressor genes, tumour markers
2.2	Techniques in molecular biology : Recombinant DNA technology, Southern blotting, RFLP, PCR, Genomic library, DNA finger printing, transgenics, gene knock out, stem cell biology, RNA interference, Gene targeting, DNA micro array, Gene therapy and vectors
2.3	Molecular methods in prenatal & new born screening, Markers of chromosomal aneuploidy in maternal serum (Quad screen) NAT for foetal DNA in maternal circulation
2.4	Immunology –Immunity-Antigen, Antibodies – Immunoglobulins, Antigen-Antibody reactions, complement system, Structure and functions of the Immune system, Immune Response, Immunodeficiency diseases, Hypersensitivity, Autoimmunity, Immunology of Transplantation and Malignancy, Immuno heamatology, Stem cell biology and applications
3.1	Basic principles of Bioinformatics
PAPER III [NUTRITION AND METABOLISM]	
1.1	Nutrition – Food composition – general nutritional requirements, energy requirements, biological value of proteins, Respiratory quotient, B.M.R., SDA, balanced diet, diet formulation in health and disease, mixed diet, nutritional supplements, food toxins, additives, parenteral nutrition
1.2	Digestion and absorption of different nutrients. Disorders of digestion and malabsorption syndromes, dietary fibers
1.3	Disorders of nutrition- PEM, obesity, dietary fibers, laboratory diagnosis of nutritional disorders and national nutritional programme
2.1	Vitamins – Classification, source active forms, metabolic role, deficiency manifestations, RDA and hypervitaminosis,antivitamins, assays
2.2	Minerals: Macro and micro minerals – Source, requirements, biochemical functions, deficiency and excess
3.1	Metabolism of carbohydrates, lipids, amino acids, TCA cycle and biological oxidation (Major and minor metabolic pathways – steps, significance, regulation and interrelationships etc)
3.2	Metabolism of purines and pyrimidines and disorders
3.3	Metabolic profile of different organs – Liver, skeletal muscle, cardiac muscle, brain, kidney, erythrocytes, adipose tissue, lens and retina
3.4	Metabolic interrelationships & metabolic alterations in starvation and obesity
3.5	Heme synthesis and break down, porphyrias and jaundice
4.1	Biochemistry of free radicals and antioxidants
4.2	Environmental toxicology, metabolism of xenobiotics
4.3	Muscular contraction, nerve conduction, coagulation of blood
5.1	Inborn errors of metabolism: Inborn errors of carbohydrates, lipids amino acids, protein nucleic acids, mineral metabolism

5.2	Abnormalities in tissue proteins – inherited and protein folding disorders, Prions
PAPER IV [CLINICAL BIOCHEMISTRY & ENDOCRINOLOGY]	
Clinical Biochemistry	
1.1	Regulation of glucose levels in body fluids-diabetes mellitus, metabolic alterations, complications and biochemical basis of management. Biochemical basis of complications in Diabetes mellitus and secondary degenerative changes associated with diabetes mellitus
1.2	Fluid , Electrolyte and Acid base balance and disorders
1.3	Glycogen Storage diseases, galactosemia, reducing substances in urine and aids to laboratory diagnosis of these disorders
1.4	Ketosis, atherosclerosis, fatty liver, lysosomal storage disorders, dyslipidemias and their lab diagnosis
1.5	Aminoacidurias, Organic acidurias and their laboratory diagnosis
1.6	Disorders of hemopoietic system, Ferro kinetic studies, Hemoglobinopathies, immunoglobinopathies, porphyrias and their lab diagnosis, Coagulation studies
1.7	Gastric and pancreatic function tests, Malabsorption syndromes and their lab diagnosis
1.8	Renal function tests, Acute renal failure and Chronic Kidney disease azotemia uremia
1.9	CSF in health and disease
1.10	LFT, jaundice, alcoholic liver disease and NASH (non alcoholic liver disease)
1.11	Clinical enzymology
2.1	Lab diagnosis of cardiac dysfunction
2.2	Principles of peritoneal and hemodialysis
2.3	Lab diagnosis of diseases of lungs and musculoskeletal system
2.4	Lab diagnosis of diseases of CNS
2.5	Lab diagnosis of AIDS and cancers and other immunological disorders
2.6	Life style diseases, Metabolic syndrome and laboratory evaluation
2.7	Laboratory evaluation methods of pregnancy related problems and infertility, Fetoplacental function tests
3.1	Metabolic bone disease and gammopathies - lab diagnosis
3.2	Composition and analysis of calculi – salivary, renal and biliary system
3.4	Automation in clinical chemistry
3.5	Quality control programmes – external and internal QCs and QC methods
3.6	Point of care testing (POCT)
Endocrinology	
4.1	Classification and general mechanism of action of hormones.
4.2	Biogenesis, secretion, control, transport and mode of action of followinghypothalamic peptides, adenohypophyseal and neurohypophyseal hormones, thyroid parathyroid hormones, calcitonin, pancreatic hormones, adenocortical and medullary hormones, gonadal hormones, gastrointestinal hormones, opioid peptides, endorphins, parathormones

4.3	Biochemistry of ovulation, conception, reproduction and contraception, endocrinological changes of pregnancy
4.4	Endocrine interrelationship and their involvement in metabolic regulation
4.5	Assessment of endocrine function and laboratory diagnosis of different endocrinopathies
4.6	Neuromodulators and their mechanism of action, physiological significance

Practical

S. No	Name of practical
1	Standardization & estimation of common analyses in blood like Urea,Glucose, Bilirubin, Uric acid, Serum proteins, ALT, AST, LDH
2	Lipid profile – TC,TAG, HDL, LDL
3	Renal function tests
4	LFT
5	Estimation of electrolytes, blood gas analysis and pH
6	Biochemical analysis of body fluids (urine, CSF, plural, peritoneal fluids, saliva etc)
7	Analysis of calculi (renal and biliary)
8	GTT
9	Urine analysis – qualitative and quantitative to include urine, protein analysis – Total proteins, ACR, Microalbuminuria
10	Estimation of Ca & P
11	Estimation of glycosylated Hb
12	Estimation of troponin, myoglobin, micro albumin
13	Estimation of Lp (a), apo A, apo B, hs CRP
14	Chromatography
15	Electrophoresis
16	Rheumatoid factor, Complement factor, Free light chains
17	Isolation of DNA from clinical samples
18	Amplification of DNA by PCR – Optional
19	Blotting techniques – Optional
20	Exercise based on quality control procedures

CLINICAL & PARA CLINICAL POSTING (8 am – 1pm, after noon in parent department)

CLINICAL	Medicine, Pediatrics, Nephrology, Cardiology and Infertility clinic 15 days each & Endocrinology/ Diabetology one month
PARA CLINICAL	Microbiology, Pathology &Blood bank. (1wk each)
CLINICAL LABORATORY	A minimum of 6 months posting should be given to all the clinical labs functioning under the Department of Biochemistry

	Posting may be given in recognized research Institutes involved in biochemical and genetics related research (for e.g. SCTIMST, Rajiv Gandhi Institute of Biotechnology, RCC etc.) for a period of 15 days each. – **Optional**, not mandatory

2.11 No: of hours per subject

Year	Topics for lecture classes
1st year	General biochemistry,Enzymes,Metabolism,Biostatistics
2nd year	Nutrition,Clinical chemistry,Endocrinology
3rd year	Molecular biology and Advanced techniques

2.12 Practical training

Year	Practical works
1st year	1.Qualitative experiments :Urine analysis – Routine urine analysis and special tests and screening for metabolic disoders. 2.Routine clinical chemistry investigations based on Colourmetry , ELISA,ISE /Flame photpmetry along with Standardization and Quality control procedures 3.Special Laboratory works : Electrophoresis,Chromatography,Screening tests
2nd year	1.Laboratory works related to thesis 2.Special investigations 3.Laboratory works related to patients and Quality control procedures
3rd year	1.Special investigations 2.Laboratory works related to patients and Quality control procedures

2.13 Records

Present in clause 2.21

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Present in clause 2. 10.

2.16 Project work to be done if any

As stipulated by the Head of Department from time to time.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

As stipulated by the Head of Department.

2.19 Reference books

1. Harper's Biochemistry
2. Biochemistry - Lehninger
3. Biochemistry – Lubert Stryer
4. Tietz text book of Clinical Chemistry and Molecular Diagnosis – Burtis
5. Clinical Chemistry – Kaplan
6. The Metabolic and Molecular basis of Inherited disease – Scriver
7. Clinical Chemistry – Principles, procedures, correlations – Bishop
8. Varley's Practical Clinical Biochemistry
9. Clinical Chemistry – William J Marshall
10. Clinical Biochemistry – Metabolic and Clinical aspects – Marshall

11. Emery's Elements of Medical Genetics - Peter Turnpenny

12. Fundamentals of Molecular Diagnostics – Bruns

13. Human Genetics – Gangane

14. Medical Biochemistry – Bhagavan

15. Master Medicine:Medical Biochemistry – A core Text with assessment – Brownie

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2.20 Journals

As stipulated by the Head of Department.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATIONS

3.1 Eligibility to appear for exams [including Supplementary]

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination).**

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule, i.e. Approximate months of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuations.

- ***Clinical / Practical and Oral***

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

Practical Examination Pattern **Total Marks: 300**

	Type of Practical	Marks
1	Clinical case based laboratory investigations & Evaluation	100
2	Standardization Experiment	75
3	Short case requiring a separation technique (either electrophoresis or chromatography)	50
4	Exercises based on Quality Control Procedures	25
5	Microteaching	50

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40										
2	Paper II	100	40										
3	Paper III	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
4	Paper IV	100	40										

3.4 Papers in each year

☆

Not applicable

3.5 Details of theory exams

Theory examination: 4 papers, each 3 hours duration with two structured long essay carrying 15 marks and 14 short essays carrying 5 marks each.

Paper I – GENERAL BIOCHEMISTRY, ENZYMES & BIOSTATISTICS

Paper II – MOLECULAR BIOLOGY, IMMUNOLOGY & CANCER

Paper III – NUTRITION AND METABOLISM

Paper IV – CLINICAL BIOCHEMISTRY & ENDOCRINOLOGY

3.6 Model question paper for each subject with question paper pattern

MD Degree Examination in Biochemistry

(Model Question Paper)

Paper I – GENERAL BIOCHEMISTRY, ENZYMES & BIOSTATISTICS

Time: 3 hrs ; Max marks:100

- ***Answer all questions*** - ***Draw diagrams wherever necessary***

Essays: **(1+3+3+8=15)**

1. A 2 year old male child admitted with c/o coughing up thick mucus, shortness of breath, passing bulky oily foul smelling stool and failure to gain weight. Mother noticed salty taste when kissing the baby. Past history of recurrent sinusitis & bronchitis +. Clinical examination and X-ray chest are suggestive of thick walled bronchiectasis. Sweat chloride showed elevated levels (>60 mmol/L).

What is your diagnosis? Explain the defect of this disorder. Classify membrane proteins based on their function. List four disorders due to membrane protein mutations and mention their respective abnormalities.

2. Define glycoproteins and enumerate their ten functions with one example. Give a brief account of diseases due to abnormal synthesis of glycoproteins. Enumerate methods used to study glycoproteins. **(1+5+4+5=15)**

Give short account of **(14 x5 = 70)**

3. Types and biological functions of glycosaminoglycans
4. ROC curve
5. Isoenzymes
6. Drugs act by enzyme inhibition
7.Ubiquitin –proteasome pathway of protein degradation

8. Detection and elimination of outliers
9. Lecithin
10. Illustrate structure of Collagen
11. Elucidate acid base catalysis with an example
12. Importance of random sampling in clinical research
13. Henderson Hasselbach equation
14.Selenocysteine
15.Size Exclusion chromatography
16.Tandem mass spectrometry

****

MD Degree Examination in Biochemistry

(Model Question Paper)

Paper II – MOLECULAR BIOLOGY, IMMUNOLOGY & CANCER

Time: 3 hrs ; Max marks:100

- *Answer all questions* - *Draw diagrams wherever necessary*

Essays:

1. Describe the classification of immunoglobulins and their functions. How does antibody diversity generated? Add a note on isotype switching. **(5+5+5=15)**

2. A 7year boy presented with a skin tumor on the forehead and history of developing blisters on exposure to sunlight. On examination, areas of hyper pigmentation and skin atrophy were present. HPE of excision biopsy of tumor showed squamous cell carcinoma. Repair rate of UV – light induced thymine dimer, was found to be very slow, in culture of fibroblasts drawn from patient's skin, in a research laboratory.
- What is your provisional diagnosis and what is its mode of inheritance
- What are the different DNA damaging agents and the respective DNA lesions and DNA repair mechanisms? - Add a note on DNA double strand break repair **(1+1+3+3+3+4=15)**

Give short account of **(14 x5 = 70)**

3. What are the mechanisms involved in carcinogensis by oncogenic viruses
4. Apoptosis
5. Mechanism of autoimmunity and two examples for autoimmune disorders
6. Post transcriptional modifications of hnRNA
6. Regulation of rate of initiation phase of translation
7. Chromatin remodelling
8. Type II Hypersensitivity reaction
9. Main steps of therapeutic cloning for stem cell therapy
10. Illustrate activation and functions of complement system
11. Telomerase
12. Major types and mechanisms of organ transplant rejection
13. HLA typing

14.PCR
15.Elucidate causation of I- cell disease
16. Small nuclear RNAs (snRNAs)

MD Degree Examination in Biochemistry

(Model Question Paper)

Paper III – NUTRITION AND METABOLISM

Time: 3 hrs ; Max marks: 100

- *Answer all questions* - *Draw diagrams wherever necessary*

Essays:

1. Kumar , a 52 year old school teacher, admitted with Hemochromatosis. What are the signs and symptoms of hemochromatosis? What is the genetic basis and mode of inheritance of this disorder? What are the biochemical investigations required to support the diagnosis? Add a note on absorption, transport and storage of iron in the body.

(3+1+1+3+3+2+2=15)

2. Briefly describe the metabolic pathways related to glucose in the body. Describe glycolysis in erythrocytes. Add a note on the oxidation of pyruvate.. **(4+ 6 +5=15)**

Give short account of **(14 x5 = 70)**

3. Lipid peroxidation & antioxidants
4. Galactosemia
5. Degradation of heme
6. Laboratory evaluation of malabsorption syndrome
7. Biochemical basis of treatment of hyperuricemia
8. Liver – Adipose tissue axis
9. Cyt P_{450} enzymes in detoxification
10. Human malignant hyperthermia
11. Rickets
12. Albinism
13. Premature and LBW babies more susceptible to hypoglycemia
14. Progeria
15.Hyperammonemia leads to brain dysfunction
16.Digitalis used to treat heart failure

****

MD Degree Examination in Biochemistry
(Model Question Paper)
Paper IV – CLINICAL BIOCHEMISTRY & ENDOCRINOLOGY

Time: 3 hrs ; Max mark: 100

- *Answer all questions* - *Draw diagrams wherever necessary*

Essays:

1. What are hemoglobinopathies and list them. Describe structural alterations of HbS leading to clinical effects. Add a note on laboratory investigations to diagnose hemoglobinopathies. **(5+4+6=15)**

2. A person lying in a comatosed state in a park was brought to the casualty by some people unrelated to the patient. Papers from patient's pocket showed that he was a diabetic on oral antidiabetic treatment O/E : Comatosed, intense smell of alcohol + ; Plasma glucose 45 mg% (2.5mmol/L). What is your probable diagnosis? Explain the biochemical basis of developing hypoglycemia on excessive alcohol intake. Discuss the causes and evaluation of fasting hypoglycemia? **(1+6+3+5=15)**

Give short account of **(14 x5 = 70)**

3. An outline of laboratory diagnosis of aminoacidurias
4. Biochemistry of atherosclerosis
5. Depict insulin signaling pathways
7. Possible molecular mechanisms related to alcoholic fatty liver
8. Causes of ketosis
9. Levey-Jennings chart
10. Endocrine evaluation of male and female infertility
11. Neuromodulators
12. Role of Laboratory in monitoring patients with Diabetes mellitus
13. Lab diagnosis of HIV infection during window period
14. Principle of hemodialysis and components of a hemodialyzer
15. Differential diagnosis of Cushing's syndrome by laboratory
16. Laboratory diagnosis of SIADH

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical exams

.

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

VivaVoce : Total – 100 marks

Oral: 80 marks

Log Book: 20 marks

4.INTERNSHIP

Not applicable for P.G. Medical degree.

5.ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerend Institution

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE

IN MEDICINE

MD COMMUNITY MEDICINE

Course Code 204

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Community Medicine

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.

- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

First Year

6 month – Theory classes
Selection of thesis topic
Thesis registration
6 Months –Involvement in regular activities of the department including undergraduate teaching.

Second Year

6 Months: Postings- different clinical posting with district and state health administration.
6 Months: Thesis preparation.
During this period, they will attend journal clubs, seminars and undertake undergraduate teaching
Study tour-1 Month. All India study tour to national institution of health, reference laboratories, Port health and industrial health administration *depending upon the discretion of HOD of Community Medicine*.

Third Year

6 Month: Thesis submission

During this period, they will attend journal clubs, seminars.
Involvement in regular activities of the department including undergraduate teaching.
Thesis should be submitted 6 months ahead of Final Examination.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As given under 2.10
The concept of healthcare counselling shall be incorporated in the relevant areas.

2.7 Total number of hours

For P.G. courses 365 days per year are working.

2.8 Branches if any with definition

As given under 2.10

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

  - The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners

to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.

3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the University.

Submission of dissertation

The dissertation shall be submitted to the Registrar (Evaluation) of the University six months prior to the final examination or as notified in the calendar of events. **Approval of the**

dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

2.10 Content of each subject in each year

SYLLABUS

1. Theory

1. Historical background of public health.
2. Concepts of health and disease
3. Principles of Epidemiology and epidemiological methods; history and development, physiology and relevance in health, techniques, research strategies, identification of research question, planning and conduct of epidemiologic studies of different kinds, uses, in depth theoretical knowledge of factors which influence the selection and interpretation of data such as bias, randomization confounding,blinding etc. Epidemiologic surveillance and epidemic preparedness, investigation and management of an outbreak.
4. Disease screening, immunology, tools and techniques of diagnosis
5. Epidemiology of communicable and new techniques of diagnosis
6. Emerging and re emerging disease
7. Demography
8. Services for mother, children and family welfare: Measuring of maternal and child health, health problems of mothers and children. Challenges in improving maternal health in India, evolution of family, limitation, RCH, NRHM.
9. Geriatrics
10. Social sciences: Relevance of social sciences in Medicine, Psychosocial and cultural determinants of Health, Models of health behavior, Communication in health. Social security, social science research methods qualitative and quantitative, questionnaire design, FGDs, in depth interview; community participation, social marketing.
11. Principles and usage of genetics in public health.
12. Environment in relation to health.
13. Nutrition
14. Mental health.
15. Health planning and management including qualitative and quantitative techniques.
16. Hospital administration
17. Health education & Communication
18. Bio statistics; Elements of biostatistics, analysis and presentation of statistical data, central tendency, dispersion, probability theory, distributions, tests of significance correlation and regression, multivariate analysis, survival analysis, nonparametric tests ,analysis of qualitative data:- principles, method of usage and relevance in health, sources of vital statistics.
19. National programmes
20. Health care delivery system

21. International health and regulation
22. Occupation health
23. Entomology and Parasitology
24. Basics of health economics
25. Voluntary health agencies and NGOs
26. Public health chemistry
27. Public health laboratory services.
28. Urban health
29. Disaster management
30. Modern techniques of teaching & training
31. Bio terrorism
32. Waste management
33. Medical ethics
34. First Aid
35. Gender issue
36. Community rehabilitation
37. Public health technologies, Health information & management system, Use of geographic information system in health, Telemedicine

2. Practicals

1. Class room teaching consisting of lectures, seminars, symposia, workshops, journal clubs and assignments.
2. Field and laboratory posting in

   a. PHC– 2 months
   b. District health administration- 1 week
   c. Urban health administration – 1 week
   d. Obstetrics and gynecology including FP– 2 weeks
   e. Paediatrics – 2 weeks
   f. DHS-1 week
   g. General Medicine – 1 month
   h. Tuberculosis Centres -1 week
   i. Institute for GIS-1 week
   j. Dermatology – 1 week
   k. Microbiology practical – 1 week
   l. Govt analyst lab /similar – 1 week

3. Other field Activities: - as many of the following types of activities as possible.

   a. Epidemic investigation
   b. Natural disasters – Management

c. Health programme evaluation
d. Surveys
e. Training and orientation to national programme

4. Regular participation in teaching undergraduate as well as public
5. Formal training in computer applications.
6. Preparation of thesis
7. Practical sessions for entomology, epidemiology, Parasitology and biostatistics scheduling of the filed postings and other activities will be carried out in the following sequence.
   Maintain logbooks by PG students.
   Organise presentations during posting, Supervision and concurrent evaluation by staff members.

2.11 No: of hours per subject

Given under 2.10

2.12 Practical training

Given under 2.10

2.13 Records

Records are to be maintained wherever applicable.

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further

evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

As given under 2.10

2.16 Project work to be done if any

As given under 2.10

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Park's textbook of preventive and social medicine- K.Park.

2.19 Reference books

Text Books Recommended

A. Public Health

1. Principles of Public Health Administration- John I Hanlon
2. Theory and Practice of Public Health – Hobson
3. Oxford text book of public health
4. Preventive medicine for the doctor in his community – Leavel and Clark
5. Preventive medicine and Public Health Maxcy and Kenneth F Rosenau
6. A treatise on Hygiene and Public health
7. Mansons Tropical disease- Wilcocks & Mansion Bahr
8. Public health & its promises in future- Smile
9. Public Health in Medicine for Medical Professional - Burton & Smith

B. Epidemiology

1. Epidemiology – Clinical practice – Barker
2. Epidemiology – Principles and methods- Brain Mac Mahan

C. Nutrition

1. Human Nutrition and Dietetics – Garro James
2. Human Nutrition and diet – Swaminathan. M
3. Nutrition in Health and Disease – Lenna.F Cooper et al
4. Introductory Nutrition – Helen Andrews and guthre

D. Infectious Disease

1. Treatment and control of infectious diseases in Man – Pascal James Imperatd
2. Principles and practice of infectious disease - Mandell, Benet and Dolin
3. Microbiology and microbial infections – Topley and Wilson

E. Occupational Health

1. Hunters diseases of Occupations
2. Health in industry – Donold Hunter
3. Occupational Health practice – Schilling.

F. Statistics

1. Statistics in Medicine
2. Biostatistics – A foundation for analysis in Health sciences.

G. Sociology

1. Social Epidemiology edited by – Lisa F Berkman, Ichiro Kawachi
2. Text book of Sociology in Medicine – Renisan
3. Hand book of Medical Sociology – Graham S & L. Reeder
4. Essentials in Qualitative research – a note Book for the field – Willms D.G. & Johnson NA

2.20 Journals

In addition to the journals related to public health, the candidate should regularly gather updated information from WHO periodicals, monographs and serial publications.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3.EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination).**

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

1. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- ***Clinical / Practical and Oral***

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

- ***Number of candidates***

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

THEORY- FOUR PAPERS- 100 MARKS EACH

Paper	**Marks**	**Topic**
Paper I –	**100 Marks**	Public health administration, Public Health Laws, Social Aspects of Health and Disease Occupational Health
Paper 11	**100 Marks**	Epidemiology Including Bio statistics, Epidemiology of Communicable and Non communicable Disease, Microbiology including Entomology
Paper 111	**100 Marks**	Maternal And Child health and family Welfare- Chemistry and Physiology of Human Nutrition, Public health Chemistry, Environmental Sanitation.
Paper IV	**100 Marks**	Health planning and management and qualitative and quantitative techniques, International health, Biomedical Waste Management, Disaster Management, Essential Medicines and Counterfeit Medicines. Recent advances in Community Medicine, Health economics

PRACTICALS

First Day

Exercise	Numbers	Marks each	Total marks	Time
Long case	One	100	100	One Hour
Short case	One	50	50	Half an Hour
Spotters	Ten	4 each	40	Half an Hour
Public Health related Microbiology OSPE	Two stations Unobserved	10 each	20	Fifteen Minutes
Statistical Excercise	Two	15 each	30	Forty five Minutes
Epidemiological Exercise	Two	15 each	30	Forty five Minutes

Second Day

Exercise	Numbers	Marks Each	Total Marks	Time
Pedagogy	One	30	30	Half hour
Viva Voce			80	
Log book			20	

Practical- (100 + 50+ 40+20+30+30+30=300)

Viva voce + Log book (80+20)=100

Total – Practical + Viva Voce + Log book= 400

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40										

☆

2	Paper II	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

4 papers, each 3 hours duration with one structured long essay carrying 20 marks and eight short essays carrying 10 marks each.

Paper	**Marks**	**Topic**
Paper I –	**100 Marks**	Public health administration, Public Health Laws, Social Aspects of Health and Disease Occupational Health
Paper 11	**100 Marks**	Epidemiology Including Bio statistics, Epidemiology of Communicable and Non communicable Disease, Microbiology including Entomology
Paper 111	**100 Marks**	Maternal And Child health and family Welfare- Chemistry and Physiology of Human Nutrition, Public health Chemistry, Environmental Sanitation.
Paper IV	**100 Marks**	Health planning and management and qualitative and quantitative techniques, International health, Biomedical Waste Management, Disaster Management, Essential Medicines and Counterfeit Medicines. Recent advances in Community Medicine, Health economics

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No.:……**

MD Degree Examinations in Community Medicine

(Model Question Paper)

Paper I – Public health administration, Public Health Laws, Social Aspects of Health and Disease Occupational Health

Time: 3 hrs Max marks:100

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essay: (20)

1. Discus the three health care delivery system in India. Suggest measures to improve its efficiency and effectiveness

Short essays: (8X10=80)

2. Social stratification and disease.
3. Pneumoconiosis
4. Health for all by 200AD.
5. Community based rehabilitation.
6. Indian factories act.
7. Primary health care
8. Ergonomics
9. Pre natal sex determination.

QP Code: **Reg.No.:……**

MD Degree Examinations in Community Medicine

(Model Question Paper)

Paper II – Epidemiology Including Bio statistics, Epidemiology of Communicable and Non communicable Disease, Microbiology including Entomology

Time: 3 hrs Max marks:100

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essay: (20)

1. Discuss the revised national tuberculosis control programme implemented in India and offer your comments.

Short essays: (8X10=80)

2. Major epidemiological types of malaria in India.
3. Common source outbreaks
4. Incidence and prevalence
5. Guinea worm eradication programme
6. Vectors in recombinant technology
7. Fertility vaccines
8. Ebola infections
9. Zoonosis

****

QP Code: **Reg.No.:……**

MD Degree Examinations in Community Medicine

(Model Question Paper)

Paper III – Maternal And Child health and family Welfare- Chemistry and Physiology of Human Nutrition, Public health Chemistry, Environmental Sanitation.

Time: 3 hrs Max marks:100

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essay: (20)

1. What are the objectives and strategies of the reproductive and child health programme implemented in our country and offer your comments.

Short essays: (8X10=80)

2. Child survival index
3. Demographical gap
4. Growth charts.
5. Radiation hazards
6. Nutritional anaemia
7. Sanitation barrier
8. Botulism
9. Flurosis

****

QP Code: **Reg.No.:……**

MD Degree Examinations in Community Medicine

(Model Question Paper)

Paper IV – Health planning and management and qualitative and quantitative techniques, International health, Biomedical Waste Management, Disaster Management, Essential Medicines and Counterfeit Medicines. Recent advances in Community Medicine, Health economics

Time: 3 hrs Max marks:100

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essay: (20)

1. Discuss the strategies for implementation of ROME programme. Mention its relevance in medical practice.

Short essays: (8X10=80)

2. Mass media approach
3. Indicators of mental health
4. Medico social works
5. Quackery in medical practice
6. Child guidance clinic
7. Appropriate technology

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8. Family medicine
9. Application of group morale

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

PRACTICALS

First Day

Exercise	Numbers	Marks each	Total marks	Time
Long case	One	100	100	One Hour
Short case	One	50	50	Half an Hour
Spotters	Ten	4 each	40	Half an Hour
Public Health related Microbiology OSPE	Two stations Unobserved	10 each	20	Fifteen Minutes
Statistical Excercise	Two	15 each	30	Forty five Minutes
Epidemiological Exercise	Two	15 each	30	Forty five Minutes

Second Day

Exercise	Numbers	Marks Each	Total Marks	Time
Pedagogy	One	30	30	Half hour
Viva Voce			80	
Log book			20	

Practical- (100 + 50+ 40+20+30+30+30=300)

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners needed (Internal & External) and their qualifications
Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva:
Viva voce + Log book (80+20)=100

4.INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc.

To be formulated by the curriculum committee of the concerend Institution

REGULATIONS 2016

Syllabus

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD DERMATOLOGY VENEROLOGY AND LEOPROSY

Course Code 205

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Dermatology Venereology and Leprosy

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Present in clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

Main subjects to be covered

1. Dermatology
2. Venereology
3. Leprosy
4. Dermatopathology
5. Dermatosurgery
6. Aesthetic dermatology
7. Research methodology
8. Communication skills
9. Bioethics

The concept of health care counseling shall be incorporated in all relevant areas.

2.7 Total number of hours

Present in clause 2.10

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

  - The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Teaching methods for Dermatosurgery

- Teaching methods would include seminars and journal club.
- Practical demonstration of techniques by a faculty member of a representative case would be part of their Minor OT posting, dermatosurgery clinic. They would also be required to assist during the procedures.
- They would be permitted to performs procedures under supervision.

Teaching Methods for Dermatopathology

- Teaching methods would include seminars and journal club
- Dermatopathology discussion in CPC .

Aesthetic dermatology

- Seminar/group discussion/ topic presentation.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.

2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.

3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a thesis individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for thesis: Synopsis including pilot study (if conducted) has to be submitted to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

3. The candidates shall report the progress of the thesis work to the concerned guide periodically and obtain clearance for the continuation of the thesis work.

4. Final completed thesis has to be submitted to the University at least six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of thesis topic by the University after it is scrutinized by the Institutional Research Committee and Institutional ethics committee (Review board) of the concerned institution. The synopsis shall be submitted to University within the first 6 months from the commencement of the course or as notified by the university.

Submission of dissertation

The thesis shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the thesis by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

SYLLABUS

DERMATOLOGY

Foundations of Dermatology

1. *History of Dermatology*
2. *Embryology of skin*
3. *Structure and functions of the skin*
4. *Histopathology of the skin : General principles*
5. *Diagnosis of skin disease*

6. *Epidemiology of skin disease*
7. *Basics of research methodology*
8. *Health economics and skin disease*
9. *Genetics and the skin*
10. *Inflammation, Immunology, and allergy*
11. *Photobiology*
12. *Cutaneous response to Injury and wound healing*
13. *Psychological and social impact of Long term Dermatological conditions*
14. *Adverse immunological Reactions to Drugs*
15. *Topical drug delivery*
16. *Clinical Pharmacology*

Management

1. *Principles of Holistic Management of skin disease*
2. *Principles of Measurement and Assessment in Dermatology*
3. *Principles of Evidence based Dermatology*
4. *Principles of Topical therapy*
5. *Principles of Systemic therapy*
6. *Principles of skin surgery*
7. *Principles of Phototherapy*
8. *Principles of Photodynamic therapy*

9. *Principles of Cutaneous laser therapy*

10. *Principles of Radiotherapy*

Infections and infestations

1. *Viral infections*

2. *Bacterial infections*

3. *Mycobacterial infections*

4. *Leprosy*

5. *Syphilis and congenital syphilis*

6. *Other Sexually Transmitted Bacterial Diseases'*

7. *HIV and the skin*

8. *Fungal infections*

9. *Parasitic diseases*

10. *Arthropod borne diseases*

Inflammatory Dermatoses

1. *Psoriasis and related disorders*

2. *Pityriasis rubra pilaris*

3. *Lichen planus and lichenoid disorders*

4. *Graft versus host disease*

5. *Eczematous disorders*

6. *Seborrheic dermatitis*

7. *Atopic eczema*
8. *Urticaria*
9. *Recurrent Angio-oedema without weals*
10. *Urticarial vasculitis*
11. *Autoinflammatory Diseases presenting in the skin*
12. *Mastocytosis*
13. *Reactive Inflammatory Erythemas*
14. *Adamantiades – Behcet Disease*
15. *Neutrophilic Dermatoses*
16. *Immunobullous diseases*
17. *Lupus erythematosus*
18. *Antiphospholipid syndrome*
19. *Dermatomyositis*
20. *Mixed connective tissue Disease*
21. *Dermatological Manifestations of Rheumatoid Disease*
22. *Systemic sclerosis*
23. *Morphea and Allied Scarring and Sclerosing inflammatory Dermatoses*

Metabolic and nutritional disorders affecting the skin

1. *Cutaneous Amyloidoses*
2. *Cutaneous Mucinoses*

3. *Cutaneous Porphyrias*

4. *Calcification of the skin and Subcutaneous Tissue*

5. *Xanthomas and Abnormalities of Lipid Metabolism and Storage*

6. *Nutritional disorders affecting the skin*

7. *Skin disorders in Diabetes Mellitus*

Genetic disorders involving the skin

1. *Inherited Disorders of Cornification*

2. *Inherited Acantholytic Disorders*

3. *Ectodermal Dysplasias*

4. *Inherited hair disorders*

5. *Genetic defects of nails and nail growth*

6. *Genetic disorders of pigmentation*

7. *Genetic blistering diseases*

8. *Genetic disorders of Collagen, Elastin and Dermal matrix*

9. *Disorders affecting Cutaneous Vasculature*

10. *Genetic disorders of Adipose Tissue*

11. *Congenital Naevi , and other development abnormalities*

12. *Chromosomal disorders*

13. *Poikilderma syndromes*

14. *DNA Repair disorders with Cutaneous features*

15. *Syndromes with Premature ageing*

16. *Hamartoneoplastic syndromes*

17. *Inherited metabolic diseases*

18. *Inherited immunodeficiency*

Psychological , sensory and neurological disorders and the skin

1. *Pruritus , Prurigo and Lichen simplex*

2. *Mucocutaneous pain syndromes*

3. *Neurological conditions affecting the skin*

4. *Psychodermatology and psychocutaneous disease*

Skin disorders associated with specific cutaneous structure

1. *Acquired disorders of epidermal keratinisation*

2. *Acquired pigmentary disorders*

3. *Acquired disorders of Hair*

4. *Acne*

5. *Rosacea*

6. *Hidradenitis Suppurativa*

7. *Other acquired disorders of the Pilosebaceous unit*

8. *Disorders of sweat glands*

9. *Acquired disorders of the nails and Nail Unit*

10. *Acquired disorders of Dermal connective Tissue*

11. *Granulomatous disorders of the skin*

12. *Sarcoidosis*

13. *Panniculitis*

14. *Other acquired disorders of Subcutaneous fat*

Vascular disorders involving the skin

1. *Purpura*

2. *Cutaneous vasculitis*

3. *Dermatoses resulting from disorders of the veins and arteries*

4. *Ulceration resulting from disorders of the veins and arteries*

5. *Disorders of the lymphatic vessels*

6. *Flushing and blushing*

Skin disorders associated with specific sites, sex and age

1. *Dermatoses of the scalp*

2. *Dermatoses of the External Ear*

3. *Dermatoses of the Eye, Eyelids and eyebrows*

4. *Dermatoses of the oral cavity and lips*

5. *Dermatoses of the Male Genetalia*

6. *Dermatoses of the Female Genetalia*

7. *Dermatoses of Perineal and Perianal skin*

8. *Cutaneous complications of Stomas and Fistule*

9. *Dermatoses of Pregnancy*

10. *Dermatoses of the Neonate*

11. *Dermatoses and Haemangiomas of Infancy*

Skin disorders caused by external agents

1. *Benign Cutaneous Adverse Reactions to drugs*

2. *Severe Cutaneous adverse reactions to drugs*

3. *Cutaneous side effects of Chemotherapy and Radiotherapy*

4. *Dermatoses induced by Illicit drugs*

5. *Dermatological manifestations of Metal poisioning*

6. *Mechanical Injury to the skin*

7. *Pressure Injury and pressure ulcers*

8. *Cutaneous reactions to cold and heat*

9. *Burns and heat injury*

10. *Cutaneous photosensitivity diseases*

11. *Allergic contact dermatitis*

12. *Irritant contact dermatitis*

13. *Occupational dermatology*

14. *Stings and bites*

Neoplastic, proliferative and infiltrative disorders affecting the skin

1. *Benign Melanocyte Proliferations and Melanocytic Naevi*

2. *Benign Keratinocyte Acanthomas and Proliferations*

3. *Cutaneous Cysts*

4. *Lymphocytic infiltrates*

5. *Cutaneous histiocytoses*

6. *Soft – tissue Tumours and Tumour – like conditions*

7. *Tumours of skin Appendages*

8. *Kaposi sarcoma*

9. *Cutaneous Lymphomas*

10. *Basal cell carcinoma*

11. *Squamous cell carcinoma and its Precursors*

12. *Melanoma*

13. *Dermoscopy of Melanoma and Naevi*

14. *Merkel cell Carcinoma*

15. *Skin cancer in the Immunocompromised patient*

Systemic disease and the skin

Cutaneous Markers of Internal malignancy

1. *The Skin and Disorders of the Haematopoietic and Immune systems*

2. *The Skin and Endocrine disorders*

3. *The skin and Disorders of the Heart*

4. *The skin and Disorders of the Respiratory system*

5. *The skin and disorders of the Digestive system*

6. *The skin and disorders of the Kidney and Urinary Tract*

7. *The skin and disorders of the Musculoskeletal system*

Aesthetic dermatology

1. *Skin Ageing*

2. *Cosmeceuticals*

3. *Soft Tissue Augumentation*

4. *Aesthetic Uses of Botulinum Toxins*

5. *Chemical peels*

6. *Lasers and energy – based devices*

Leprosy

1. *Approach to the patient with leprosy*
2. *Epidemiological Aspects*
3. *Structure, biochemistry, microbiology of Mycobacteriumleprae*
4. *Animal models*
5. *Pathogenesis*
6. *Classification*
7. *Immunology and molecular biological aspects*
8. *Histopathology and diagnosis including laboratory aids*
9. *Clinical features*
10. *Reactions*
11. *Systemic involvement (Ocular, bone, mucosa, testes and endocrine etc.)*

12. *Pregnancy and leprosy*
13. *HIV infection and leprosy*
14. *Therapeutic aspects including newer drugs.*
15. *Immunotherapy*
16. *Disabilities, deformities and Rehabilitation*
17. *Prevention, education and counseling*
18. *National Leprosy Control and Elimination Programme*

Venereology

1. *Clinical approach to the patient of sexually transmitted disease.*
2. *Anatomy of Male & Female Genitalia.*
3. *Epidemiological aspects of STIs*
4. *Viral STI including HIV, Herpes, HPV,Molluscum Contagiosum, EBV, etc*
5. *Bacterial STIs; Syphilis, Gonorrhoea, Chancroid, Donovanosis.*
6. *Chlamydial infections; Lymphogranuloma Venereum, Urethritis, Cervicitis,*
7. *Nongonococcal urogenital infections, Nonspecific Vaginitis.*
8. *Fungal Infections; Candidiasis.*
9. *Protozoa ; Trichomoniasis.*
10. *Ectoparasite : Scabies, Pediculosis. Infestation*
11. *Syndromic Management of STIs*
12. *STIs in Reproductive & Pediatric*
13. *STIs & HIV.*
14. *Prevention, Counselling & Education of different STIs including HIV.*
15. *National Control Programmes of STIs & HIV.*
16. *Medicolegal, Social Aspects of STIs including Psychological & Behavioural abnormalities in STI patients.*

Dermatosurgery

Teaching methods for Dermatosurgery

- Teaching methods would include at least 10 theory lectures in the form of seminars and journal club.
- Practical demonstration of techniques by a faculty member of a representative case of each disease would be part of their Minor OT posting, dermatosurgery clinic. They would also be required to assist during the procedures.
- Theory – The subject is included in paper IV of the theory examination and at least one short note would be from the dematosurgical procedures.
- Practical – They would be subjected to questions on various dermatosurgical procedures and instruments related to these procedures during their viva voce examination.

Teaching Methods for Dermatopathology

- 10 theory lectures in form of seminar, journal club
- Dermatopathology discussion every week. There should be questions on Dermatopathology in findings

Aesthetic dermatology

- Seminar, group discussion, topic presentation. There should be questions on Aesthetic dermatology in Paper IV.

Research methodology

- Introduction to research methodology. There should be questions on Aesthetic dermatology in Paper I.

2.11 No: of hours per subject

Present in clause “Content of each subject in each year “ of the curriculum.

2.12 Practical training

POSTINGS

The first year junior residents shall be posted indoor for 6 months exclusively. For the remaining 30 months the students will rotate through outdoor, side laboratory, minor OT, speciality clinics, i.e. leprosy, STD, psoriasis, pigmentation, allergy and dermatosurgery.

- Dermatology Ward - 6 months
- General Skin OPD - 16 months
- Minor OT& Side Laboratory - 4 months
- Phototherapy - 3 months
- STI Clinic - 3 months
- Aesthetic clinic - 2 months
- Speciality Posting - 2 months

The above schedule is a provisional one and is subject to modifications as per the discretion of the head of department to ensure sufficient exposure to various facets of training and the departmental and institutional objectives. The postings will be spread over the entire period. During postings 2nd and 3rd year residents or senior residents will give cover to first year residents and have active involvement in the diagnosis, investigations and treatment of the admitted patients.

Teaching Programme

1. Teaching ward rounds
2. Clinical case conference
3. Seminars
4. Journal club
5. Case presentation and discussion In Dermatology ,Leprosy, STI
6. Dermatopathology discussion weekly
7. Structured group discussion

2.13 Records :

Present in clause 2.21

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any:

Present in clause 2.10

2.16 Project work to be done if any:

Not applicable

2.17 Any other requirements [CME, Paper Publishing etc.] :

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Present in clause 2.19

2.19 Reference books

1. Fitzpatrick's Dermatology in general medicine - 8th edition
2. Rook's Text book of Dermatology - 9th edition
3. Dermatology – 3rd edition- Jean L bolognia, Joseph L Jorizzo , Julie V Schaffer
4. IADVL text book of Dermatology 3rd edition
5. Sexually transmitted diseases (King K.Holmes) 2nd edition
6. Venereal diseases (Ambrose King, Claude Nicol, Philip Rodin 4th edition
7. Hand book of Leprosy (Jopling)
8. Leprosy (Robert C Hastings)

2.20 Journals:

Either hard copy/soft copy

1. Journal of American Academy of Dermatology
2. British Journal of Dermatology
3. Indian journal of Dermatology, Venereology&Leprology
4. Indian Journal of Leprosy
5. JAMA Dermatology
6. Paediatric Dermatology
7. Indian Journal of Pediatric Dermatology
8. International journal of Trichology
9. Leprosy review

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must also be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website

(www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3.EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination).**

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases .

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to the subject. Case selection for examination should be comprehensive and include different systems important for the subject.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

M.D. DERMATOLOGY AND VENEREOLOGY

- Theory - 400 marks
- Clinical / Practical - 300 marks
- Oral - 100 marks

Theory: 4 papers , each 3 hours duration with one structured long essay carrying 20 marks and eight short essays carrying 10 marks each.

Practicals :- Total 300 marks

1 long case - 100 marks

2 short cases - 100 marks

10 spotters - 100 marks

Viva : Total 100 marks

Histopathology -20 marks

Instruments -10 marks

Drugs - 10 marks

Viva - 40 marks

Log book - 20 marks

Sl. No.	Subject	Theory		Theory Group		Practical					Practical Group		Total	
		University				University		Viva		Logbook				
		Max	Min	Max	Min	Max	Min	Max	Min		Max	Min	Max	Min
1	Paper I	100	40	400	200	300		80		20	400	200	800	400
2	Paper II	100	40											
3	Paper III	100	40											
4	Paper IV	100	40											

3.4 Papers in each year :

Not applicable

3.5 Details of theory exams

4 papers, each 3 hours duration with one structured long essay carrying 20 marks and eight short essays carrying 10 marks each.

Paper I – Basic Science as Applied to Dermatology and Recent Advances

Paper II – Dermatology and Therpeutics

Paper III – Dermatology in Relation to Systemic Diseases

Paper IV – Venerology and Leprosy

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3.6 Model question paper for each subject with question paper pattern

QP Code: Reg. No:

MD Degree Examinations in DVL (Dermatology, Venerology & Leprosy)

(Model Question Paper)

Paper I – Basic Science as Applied to Dermatology and Recent Advances

Time: 3 hrs Max marks: 100

• ***Answer all questions***

• ***Draw diagrams wherever necessary***

Essays: (20)

1. Describe the ultrastructure of Basement membrane zone. Enumerate the immunobullous diseases associated with disorders of the components the zone

Short essays: (8x10=80)

2. Keratinization
3. Lipid storage disorders
4. Albinism
5. Idiosyncrasy
6. Zinc deficiency
7. Schwann cell
8. Temperature regulation
9. Human genome project

****

QP Code: Reg. No:

MD Degree Examinations in DVL (Dermatology, Venerology & Leprosy)

(Model Question Paper)

Paper II – Dermatology and Therpeutics

Time: 3 hrs Max marks: 100

• ***Answer all questions***

• ***Draw diagrams wherever necessary***

Essays: (20)

1. Enumerate the different types of psoriatric arthropathy. Dicuss the role of biologics in the treatment of psoriasis

Short essays: (8x10=80)

2. Xanthoma disseminatum
3. Drug hypersensitivity syndrome
4. Cryosurgery
5. Topical sunscreens
6. Sporotrichosis

☆

7. Trichodynia
8. Cutaneous leishmaniasis
9. Patch testing

****

QP Code: **Reg. No:**

MD Degree Examinations in DVL (Dermatology, Venerology & Leprosy)
(Model Question Paper)
Paper III – Dermatology in Relation to Systemic Diseases
Time: 3 hrs Max marks: 100
• ***Answer all questions***
• ***Draw diagrams wherever necessary***

Essays: (20)

1. Enumerate the ARA criteria for Systemic Lupus Erythematosus. Discuss the sensitivity and specificity of these criteria in the diagnosis of SLE

Short essays: (8x10=80)

2. Acanthosis nigricans
3. Mononeuritis multiplex
4. Lupus band
5. Cutaneous manifestations of uremia
6. Gianotti-Crosti syndrome
7. Primary HIV infection
8. Heliotrope erythema
9. Diabetic dermopathy

****

QP Code: **Reg. No:**

MD Degree Examinations in DVL (Dermatology, Venerology & Leprosy)
(Model Question Paper)
Paper IV – Venerology and Leprosy
Time: 3 hrs Max marks: 100
• ***Answer all questions***
• ***Draw diagrams wherever necessary***

Essays: (20)

1. Classify antiretroviral drugs. Discuss the adverse effects of these drugs

Short essays: (8x10=80)

2. Leprosy vaccines
3. Histoid leprosy
4. Dapsone resistance
5. Bone involvement in leprosy
6. Relapse in leprosy
7. Circinate balanitis
8. Kaposi's sarcoma
9. Syphilis in cognito

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practical exams

Practicals :- Total 300 marks

1 long case	- 100 marks
2 short cases	- 100 marks
10 spotters	- 100 marks

Oral : Total 100 marks

Histopathology	-20 marks
Instruments	-10 marks
Drugs	- 10 marks
Viva	- 40 marks
Log book	- 20 marks

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

Total 100 marks

Histopathology	-20 marks
Instruments	-10 marks
Drugs	- 10 marks
Viva	- 40 marks
Log book	- 20 marks

4.INTERNSHIP

Not applicable for P.G. Medical degree courses.

5.ANNEXURES

5.1_Check Lists for Monitoring: Log Book, Seminar Assessment etc.to be formulated by the curriculum committee of the concerend Institution

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE

IN MEDICINE

MD GENERAL MEDICINE

Course Code: 206

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. General Medicine

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and/or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.

- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.

- Who shall be aware of the contemporary advance and developments in the discipline concerned.

- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.

- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals/students/trainee.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive measure/strategies.

- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As given in clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.Thecourse should be successfully completed within double the duration of the stipulated period of the course.

2.6 Syllabus

As given in clause 2.10

The concept of Health Care counselling shall be incorporated in all relevent areas.

2.7 Total number of hours

As given in clause 2.10 .

2.8 Branches if any with definition

Specialties of medicine as given in clause 2.10.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percentof the training period, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmenta lseminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head ofthe department.

Thesis

During the course of study every candidate has to prepare a Thesis– individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for Thesis work is:

1. Preparation work for thesis Synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for Thesis and writing the Thesis
3. The candidates shall report the progress of the Thesis work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the thesis six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of Thesis topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the university.

Submission of Thesis

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

EVALUATION OF RESIDENTS: -

Evaluation of residents for their knowledge and acquisition of attitudes, skills and competencies is a continuous process throughout their 3-year period of training. Evaluation of certain attributes such as interpersonal relationships, professional responsibility, sensitivity to patient's need for comfort, ethical behavior etc. is closely observed by the teaching faculty during the day-to-day clinical work of the resident. At the end of each clinical posting in each of the medicine units and the sub specialties mentioned above, the residents are assessed in a format by the faculty staff of the concerned unit/department.

2.10 Content of each subject in each year

Diseases in General Medicine:-Uptodate knowldge of internal medicine practiced in India and elsewhere
Hematology:

I. Red cell disorders:

Approach to a patient with anemia, nutritional, iron deficiency, aplastic,megaloblastic, haemolytic anemia, (special emphasis on thalassemia &sickle cell anemia), hereditary spherocytosis, and anemia of chronic disease, autoimmune hemolytic anemia, paroxysmal nocturnal hemoglobinuina, myelodysplastic syndromes, iron overload, and sideroblastic anaemias.

II. White cell disorders:

Eosinophilia, febrile neutropenia, approach to a patient with splenomegaly & lymphadenopathy, lymphomas, multiple myeloma & related plasma cell disorders, leukemias, hairy cell leukemia.

III. Bleeding & coagulation disorders:

Approach and investigations in patients with bleeding disorders,hemophilia, von willebrand's disease, immune thrombocytopenic purpura, vascular purpuras, henoch schonlein purpura, thrombotic thrombocytopenic purpura, disseminated intravascular coagulation, anticoagulant and anti-platelet therapy.

IV. Miscellaneous:

Approach to a patient with thrombosis, blood groups, transfusion related diseases, blood transfusion reactions, blood component therapy,hematological manifestations of systemic diseases, drug induced hematological disorders, hypersplenism, chemotherapy, bone marrow transplantation, thrombophilias, platelet function disorders, estimation of hemoglobin/ total and differential white cell count/ erythrocyte sedimentation rate, preparation and staining of blood smears.

Endocrine:

I. Disorders of glucose metabolism:

Glucose metabolism, physiology of insulin & glucagon secretion, glucose tolerance test, diabetes mellitus, insulin preparations, hypoglycemia, glycosuria of causes other than diabetes mellitus, glucagon secreting tumors.

II. Thyroid gland & its disorders:

Iodine metabolism, anatomy & physiology of thyroid gland, thyroid function tests, goiter, hypothyroidism and hyperthyroidism, myxoedema, cretinism, thyroid carcinoma, other rare syndromes of thyroid dysfunction.

III. Disorders of anterior pituitary:

Anatomy & physiology of various hormones & their regulation, acromegaly, gigantism, Sheehan's syndrome.

IV. Disorders of posterior pituitary:

Anatomy and physiology, diabetes insipidus, syndrome of inappropriate anti-diuretic hormone (SIADH) secretion, obesity.

V. Disorders of adrenal cortex

Regulation of secretion of glucocorticoids, mineralocorticoids & adrenal sex hormones, adrenal insufficiency, Cushing's syndrome, pheochromocytoma.

VI. Miscellaneous

Dwarfism, Frohlich's syndrome, Lawrence Moon Biedel syndrome, anorexia nervosa & bulimia, Hypothalmus in health & disease, Conn's disease, gynaecomastia, non-puerperal galactorrhoea, multiple endocrine neoplasia syndromes, hirsutism, adreno-genital syndromes, disorders of sexual differentiation.

Cardio–Vascular System

ECG & it's interpretation, diagnosis of arrhythmias & their management, ischaemic heart disease, hypertension, rheumatic fever & rheumatic heart disease, congenital heart diseases, heart failure, pericardial diseases, peripheral vascular diseases, deep vein thrombosis, cardiomyopathies, principles of echocardiography & abnormalities in common disorders, pacemakers, nuclear medicine in cardio-vascular disorders, tumors of the heart, aneurysm & dissection of the aorta, thoracic outlet syndrome, cardiac catheterisation, cardiac interventions.

Respiratory System

Approach to a patient of respiratory system involvement, pulmonary function tests, arterial blood gases, bronchoscopy, imaging studies, pulmonary angiography, therapeutic interventions: pulmonary artery embolisation/ video assisted thoracic surgery/ thoracotomy/ mediastinoscopy, diseases of the upper airway including avian influenza, bronchial asthma, occupational lung diseases, pneumoconioses, organic dusts & environmental carcinogens, pneumonia, bronchiectasis, obstructive airways diseases, interstitial lung diseases, diseases of the pleura: effusion/ pneumothorax/ empyema/ haemothorax, air pollution, respiratory failure, adult respiratory distress syndrome, severe acute respiratory syndrome (SARS), mechanical ventilation, mediastinal diseases, infections including tuberculosis, tumors, primary and

metastatic carcinomas, hypersensitivity pneumonitis, eosinophilic pneumonias, pulmonary hypertension, sleep apnea, pulmonary thromboembolism, lung transplant.

Nervous System

Investigations: lumbar puncture/ cerebrospinal fluid examination/ electroencephalography/ evoked potentials/ nerve conduction studies/ electromyography/ imaging studies/ angiography, migraine, seizures/ epilepsy, cerebrovascular diseases, sub-arachnoid haemorrhage, dementia, extra pyramidal disorders, Parkinson's disease, motor neurone disease, disorders of cranial nerves, meniers syndrome, benign positional vertigo, diseases of the spinal cord, cranio-vertebral anomalies, tumors of the nervous system, demyelinating diseases, meningitis, infections of nervous system, nutritional and metabolic disorders, central pontine myelinolysis, Wernicke's encephalopathy, alcoholic cerebral degeneration, pellagra, subacute combined degeneration, polyneuropathies, acute and chronic inflammatory demyelinating polyneuropathies, diabetic neuropathies, mononeuritis multiplex, mononeuropathy, leprosy, neuromuscular junction disorders including myasthenia gravis, myopathies (hereditary/ endocrine/ metabolic/ thyroid diseases/ parathyroid diseases/ diabetes mellitis), periodic paralysis, approach to a patient paralysis, dizziness & vertigo, diplopia, syncope and transient loss of consciousness, involuntary movements, delerium, ataxia, parasthesias & sensory loss, unconsciousness, bowel & bladder abnormalities, progressive supranuclear palsy, dystonia, spinocerebeller ataxia, drug induced movement disorders, inherited ataxia, traumatic injuries, subdural & epidural hematoma, radiation & chemotherapy in treatment of nervous system tumours, subdural empyema, progressive multifocal leucoencephalopathy, subacute sclerosing pan encephalitis, progressive rubella, panencephalitis, kuru, molecular treatment
of neurological disorders, disorders of the autonomic nervous system, details of traumatic injuries to skull & spine, hereditary & metabolic disorders of late onset, mitochondrial myopathies, lipid storage disorders.

Infectious Diseases

Sepsis syndromes, pyrexia of unknown origin, infective endocarditis, acute infectious diarrhoeal diseases & food poisoning, infections of the urinary tract, infections of skin/ muscle/ soft tissues, infections in intravenous drug abusers, hospital acquired infections, infection control in hospital, bacterial infections, specific infections: pneumococcal/ staphyloccal/ tetanus/ streptococcal/ diphtheria/ botulism/ gas gangrene/ meningococcal/ gonococcal/ salmonella/ shigella/ vibrio cholera/ brucella/ plague/ syphilis/ mycobacteria/ leptospira/ mycoplasma/ pseudomonas/ helicobacter pylori, viruses: herpes/ varicella/
ebstein barr virus/ cytomegalo virus/ rabies/ respiratory viruses/ influenza/ measles/ mumps/ rubella/ arboviruses, fungal: candidiasis/ aspergillosis/ mucormycosis, parasites: ameobiasis/ giardiasis/ pneumocystis carinii/ malaria/ leishnianiasis/ cryptosporidium/ microspondium/ isospora/ filariasis/ neurocysticerosis/ worm infestations, tropical diseases, pancreatitis, osteomyelitis, infections due to bites/ scratches/ burns, tularemia, pertussis, bartonellosis, arenaviruses, moraxella, legionella, nocardia, actinomycetes,

borellia, chlamydiae, rickettsia, newer emerging infections: avian influenza, chikungunya, others.HIV/AIDS: Aetiology & pathogenesis, clinical presentations, modes of transmission, universal precautions, opportunistic infections, management and treatment of the disease, complications, antiretroviral therapy, prophylaxis: post exposure prophylaxis , recent advances, historical record.
Principles of antibiotic stewardship implementation should be incorporated during the trainning.

Hepato-Biliary System

Liver function tests, jaundice, hepatitis, cirrhosis of liver, portal hypertension, hepatic encephalopathy, hematemesis, amoebic hepatitis, granulomatous hepatitis, hydatid cyst, primary and metastic carcinomas, liver transplant, gall bladder diseases: cholelithiasis/ cholecystitis/ diseases of bile-duct/ cholangiocarcinoma.

Gastrointestenal Tract

Peptic ulcer disease, gastrointestinal bleeding, gastritis, endoscopy, radiological procedures, infections, inflammatory bowel disease, functional gut disorders, motility disorders, malabsorption syndromes, pancreatitis, cystic fibrosis, malignancy. Kidney
Renal failure, renal replacement therapies, hematuria, proteinuria, polyuria, oliguria, anuria, contrast nephropathy, urinary tract infections, glomerulonephritis, nephritic syndromes, tubulo-interstitial diseases, kidney in systemic diseases, tumours of the urinary tract, renal calculous disease, barter's syndrome, fabry's disease, malignancy.

Geriatric Medicine

Theories of ageing, demographic patterns (world / Asia / India) and their significance to health care system, physiological changes in the elderly, diseases in elderly, pharmacotherapy in the elderly, rehabilitation, physiotherapy, occupational therapy, psychotherapy, legal aspects (elderly abuse), psychiatric illnesses in elderly population, geriatric assessment, geriatric emergencies.

Granulomatous Diseases

Tuberculosis, leprosy, syphilis, sarcoidosis, Wegener's granulomatosis, histoplasmosis, coccidoidomycosis, mucocutaneous leishmeniasis, midline granuloma, lymphomatous granuloma, pseudotumor of the orbit.

Ethical & Legal Issues in Medicine

Importance and procedures of informed consent, emergency & life saving intervention & treatment, information to be given to patient & relatives, rights of patients including confidentiality, withdrawing life support systems, organ transplant from cadaver, euthanasia,

consumers protection act, clinical decisions for a patient who lacks decision of signing of will, ethics committee & its role in medical research, procedures (medico legal) followed in cases of poisoning, suspected rape, adverse reaction to drugs and interventions, absconded patients, in-hospital injuries and suicide, treatment of pregnant patients with drug and interventions likely to cause fetal harm, cloning, stem cells usage and preservation, crimes performed by addicts.

Poisonings

Diagnosis and management of specific and unknown poisonings, universal & specific antidotes, acids and alkalis, kerosene, petroleum products, organophosphates and carbamates, household disinfectants, mosquito repellants, aluminium phosphide, zinc phosphide, yellow phosphorus, heavy metals, paracetamol, barbiturates, snake and scorpion bites, botulism, drug over-dosages, international classification of poisonous chemicals, environmental hazards and poisonings, industrial toxicology, toxidromes, nuclear, biological, chemical warfare.

Women`s Health

*Medical disorders during puberty and menopause ,*Maternal & foetal physiology, principles of maternal morbidity & fetal outcome, medical disorders during pregnancy, infections in pregnancy, metabolic disorders, hyponatremia, thyroid disorder, hypertension and eclampsia, renal failure, disseminated intravascular coagulation, diabetes, valvular heart disease, bronchial asthma, cardiomyopathies, jaundice, HIV/AIDS, hypercoagulable state and its sequelae and complications, cortical venous sinus thrombosis in pregnancy, post-partum sepsis, aminotic fluid embolisation, Epilepsy, drugs in pregnancy, poisonings in pregnancy, smoking, alcoholism, surgery and pregnancy, psychiatric diseases in pregnancy, medical disorders and infertility, genetic disorders & genetic counseling, ethical issues in pregnancy (brain death).

Radiology

Roengenograms of chest/ abdomen/ spine/ skull/ paranasal sinuses/ bones and joints, computerized tomography (CT) and magnetic resonance (MR) imagings, angiography, digital substraction angiography, imaging techniques for hepatobiliary system, barium studies, intravenous urography, scintigraphy, radionuclide imaging of kidney/ bone/ heart/ liver/ lung/ gall bladder/ thyroid/ parathyroid/ whole body, echocardiography, ventriculography, positron emission tomography (PET) scan, lymphangiography, cardiac catheterization, ultrasound, color doppler, developing and newer imaging techniques.

Disorders Bone & Mineral Metabolism

Calcium and phosphorous homeostasis, parathroid gland disorders, vitamin-D in health & disease, metabolic bone disease, osteoprosis, osteomalacia, endocrine hormonal influences on bone metabolism, phosphorus metabolism, hypophosphatemia, hyperphosphatemia, disorders

of magnesium metabolism, Pãget's disease of bone, osteomyelitis, bone dysplasias, osteoarthritis, spondylosis, bone in systemic diseases.

Immunology

Normal immune system and its functions, hypersensitivity reactions, T-cell mediated diseases, mechanism of tissue damage, cytokine mediated injury, cytokine inhibitors, interaction of T and B cells, complement system, apoptosis, immunotherapy, immunomodulators, immunosuppressive agents, monoclonal antibodies, stem cell transplant in immune disorders, HLA system, primary immune deficiency diseases, amyloidosis, disorders of immediate type hypersensitivity, biological response modifiers, immunologically mediated skin disorders.

Rheumatology

Pathophysiology of inflammation, autoantibody revelance in disease processes, rheumatoid arthritis including extra-articular manifestations, glucocorticoid therapy in connective tissue diseases, systemic lupus erythematosis (SLE), organ targeted therapy, vasculitides, ankylosing spondylitis, reactive arthritis, undifferentiated spondyloarthropathy, polyarteritis nodosa, Wegener's granulomatosis, Churg Strauss disease, Takayasu's arteritis, cutaneous vasculitis, imaging techniques in systemic vasculitis, approach to acute and chronic monoarthritis & polyarthritis, diagnostic imaging in joint disease, crystal arthropathies, gout, infectious arthritis, infections in patients with connective tissue diseases, anti-phospholipid antibody syndrome (APLA), drug induced rheumatic diseases, scleroderma, sarcoidosis, fibromyalgias, haemophilic arthropathy, dermatomyositis, polymyositis, overlap syndromes, sjogrens syndrome, calcium oxalate deposition disease, psoriatic arthritis, neuropathic joint disease, osteoarthritis.

Fluid & Electrolyte

Choice of intravenous fluids, plasma expanders, potassium/ calcium/ sodium/ magnesium/ phosphate disorders, acid base balance and disorders.

Critical Care

Cardio-pulmonary resuscitation, non-invasive and invasive cardiovascular monitoring, circulatory failure, heart failure, acute myocardial infarction, pulmonary embolism, respiratory failure, pulmonary aspiration, nosocomial pneumonia, mechanical ventilation, toxicology, renal failure, status epilepticus, Guillian Barre syndrome, myaesthenia, use of blood products, intravenous immunoglobulins, plasmapheresis, hyperthermia, hypothermia, diabetic ketoacidosis, addisonian crisis, myxedema coma, endotracheal intubation, pacemakers, strokes,

subarachnoid haemorrhage, near-drowning, circulatory and ventilatory support in adult respiratory distress syndrome (ARDS), asthma, obstructive airways disease, renal replacement therapy.

Emergency Medicine

Basic and advanced life support, disaster management, use and maintenance of equipment used in life support, acute sever asthma, status epilepticus, poisonings, heart failure, shock, acute myocardial infarction, angina, arrhythmias, hypertensive emergencies, medical emergencies in pregnancy, gastro-intestinal bleeding, hepatic encephalopathy, acute gastroenteritis, hemoptysis, obstructive airways disease, tension pneumothorax, adult respiratory distress syndrome (ARDS), respiratory failure, corpulmonale, stroke, sub-arachnoid haemorrhage, oliguria/ anuria, coma, pneumonia, meningitis, infections, sepsis syndromes, multi-organ failure, bleeding manifestations, endocrine emergencies, electric shock, poisonings, snakebite, scorpion stings, anaphylaxis, nuclear/ biological/ chemical exposures, toxidromes, rabies, burns, strangulation, interventions and procedures: mechanical ventilation/ temporary cardiac pacing/ invasive monitoring/ needle and tube thoracostomy/ cricothyrotomy

Structured Training Programme

Total: 36 months

First Year Residency*:* Medicine units [Appendix -1]

a. Outpatients/inpatients care. Appendix -A
b. Managing medical emergencies.
c. Learning diagnostic/ therapeutic procedures and interventions.
d. Interpreting Reports.
e. Starting Thesis
f. Teaching junior Residents / under-graduate students enrolled in the subject.
g. Use of computers in medicine and EMR.

Second Year Residency- *:*

Speciality Duration

1 Nephrology:	1 month
2 Gastroentrology:	1 month
3 Casualty:/ICU	1 month

4 Cardiology:	2 months
5 Neurology:	2 months
6 Psychiatry:	1 month
7 Dermatology:	2 weeks
8 Infectious diseases including ART:	2 weeks
9 Pulmonology:	1 month
10 * Optionals	2 weeks each x 4

*

(Radiodiagnosis/Medical oncology and Radiotherapy/ Clinicalpathology/Microbiology/Anaesthesiology/Geriatrics/ Rheumatology/Endocrinology - 2 months)

The posting and training may be arranged from medical unit posting

3. Third Year Residency*:* Medicine units

a. Outpatients and in-patients care.
b. Independent management of emergencies.
c. Teaching junior Residents / under-graduate students enrolled in the subject.
d. Finalisation and submission of Thesis

2.11 No of hours per subject

All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80% (Eighty percent) of the training during each calendar year, and given full time responsibility, assignments and participation in all facets of the educational process.

All residents must attend seminars, group discussions, journal club, clinical club, case discussions, mortality meeting and Clinicopathological Conferances arranged by the department.

2.12 Practical training

As per clause 2.10

All residents must attend programmes arranged by the department like

a. Grand rounds

b. Medical/Surgical management conference

c. Consultant's lecture

d. Morbidity and Mortality conference

e. Clinico- Pathological Conference

f. Medical/Surgical Trainee's Lecture/ case presentation

g. Didactics

h. Continuing Medial Education programs etc

i.Skill training in CPR and other programmes arranged by Medical education unit

2.13 Records

As per clause 2.21

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation,if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be reevaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

Change of Guide is permissible in unavoidable circumstance like transfer or demise of the guide with recommendation of Head of department and principal.Co Guides are recommended especially when other departments are also involved in the study.

2.15 Speciality training if any

All residents shall undergo training in specialities during second year.

2.16 Project work to be done if any

As per direction of the Head of department.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

a) Davidson`s principles and practice of Medicine
b) Current Medical Diagnosis and Treatment(CMDT)
c) Harrison's Principles of Medicine.
d) Oxford Textbook of Medicine.
e) Cecil Textbook of Medicine.
f) API Text Book of Medicine.
g) Hutchisons Clinical methods.
h) Macleods Clinical methods.
i) Text book of Medicine .K.V Krishnadas
j) Introduction to Clinical Methods-Lakshmanakumar
k) Clinical Methods -K.V.Krishnadas.
l) Haris Essentials of Clinical Medicine -P.Baburaj.

2.19 Reference books

a) Infectious diseases – Christie/Mandell and Douglass
b) Critical care medicine – Cretta
c) Diabetes – Joslin Clinic Mannual
d) Neurology – De Jong
e) MMT – Waghington University
f) Goodman – Gillman – Pharmacology.
g) Wintrobe's Hematology.
h) Kelly's Textbook of Rheumatology.
i) Brain's Neurology.
j) Crofton and Douglas Respiratory Medicine.
k) Hepatology by Sheila Sherlock., Sleiseinger
l) Electrocardiography by Shamroth.
m) Braunwauld's Cardiology.
n) Hurst cardiology
o) Brazis Nurology

2.20 Journals

a) Lancet.
b) British Medical Journal.
c) Chest.
d) ICMR Bulletin.
e) WHO Bulletin.
f) New England Journal of medicine.
g) Journal of Association of Physicians of India
h) Journal of Postgraduate Medicine.
i) Annals of Internal Medicine.
j) APICON Medicine Update.
k) Medical Clinics of North America.
l) Journal of Applied Medicine.
m) Journal of General Medicine.
n) Online Plos Journals, Medscape.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests

performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3.EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of thesis and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination).**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year with an interval of not less than 4 and not more than 6 months between the two examinations. Examination may be clubbed together if there is insufficient number of candidate in one centre.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and three short cases.(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.
Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. / Degree.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40										
2	Paper II	100	40										
3	Paper III	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Theory - 400 marks

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

- Paper I - Basic Science as Applied to General Medicine
- Paper II - Clinical Medicine, Cardio-vascular system, Respiratory system, Nephrology, Rheumatology, Immunology, Infectious diseases, Dermatology.
- Paper III – - Clinical Medicine, Gastroenterology, Nervous system, Psychiatry, Hematology, Oncology, Palliative Medicine, Endocrinology, Womens Health ,Geriatrics
- Paper IV-Clinical Medicine, Tropical Medicine, Toxicology, Recent Advances in General Medicine including Research Methodology ,ethical principles of practice of Medicine and Medical Statistics

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No:**

MD Degree Examinations in General Medicine
(Model Question Paper)
Paper I - Basic Science as Applied to General Medicine
Time: 3 hrs
Max marks:100
●Answer all questions
●Draw diagrams wherever necessary

Essays:(20)

1.A 33yearold male with a BMI of 24 has a fasting lipid profile as a part of his regular screening. Past medical history and family history noncontributory. Medications None. Fasting lipid profile- Triglycerides 150 mg/dL, Total cholesterol 250 mg/dL ,HDL 36 mg/Dl, LDL 150 mg/dL

- How will you advise this patient
- Discuss the pathogenesis, the diagnostic tests, therapeutic interventions, and follow up strategies for low HDL cholesterol levels

(5+15=20)

Short essays: (8x10=80)

2. Bronchopulmonary segments

3. Nervous control of urinary bladder

4. Pharmacodynamics.

5. Vitamin D deficiency

6. Serological markers of hepatitis B infection

7. Gut Hormones.

8. Oxygen dissociation curve

9 Aschoff nodule

****

QP Code: **Reg.No:**

MD Degree Examinations in General Medicine (Model Question Paper)

Paper II–Clinical features (Clinical Medicine), Cardio-vascular system,, Respiratory system, Nephrology, Rheumatology, Immunology, Infectious diseases, Dermatology.

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Essays:(20)

1.A 26-yearold woman (height 160 cm, weight 98 kg,) who had recently travelled by car for

about 8 hours continuously, came to the emergency department with sharp, left sided chest

pain on inspiration, of one day duration. There was no fever or weight loss. She was apparently asymptomatic before and had no other significant illness or abnormal habits in the past. Physical examination showed pleural rub and the chest X-ray showed a right upper zone

shadow.

- What is the most likely diagnosis, and what are the possible risk factors
- Discuss how you will proceed to evaluate the patient
- Discuss the treatment options and how will you prevent it

(5+5+10=20)

Short essays: (8x10=80)

2. Indications and types of Pacemakers

3. Typhus fever-remergence

4. Solitary Pulmonary Nodule –diagnostic approach

5. Leishmaniasis in India

6. Renal Transplantation in the Indian set up

7. Hook worm infestation.

8. Management of malaria in pregnancy

9. Antibiotic resistance and its prevention

****

QP Code: **Reg.No:**

MD Degree Examinations in General Medicine (Model Question Paper)

Paper III – Clinical Features (Clinical Medicine), Gastroenterology, Nervous system, Psychiatry, Hematology, Oncology, Endocrinology, Womens health ,Geriatrics

Time: 3 hrs

Max marks:100

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays:(20)

1 .A 24 year old male presented to the emergency department with weakness of both lower limbs of one day duration, he found that he was unable to move his legs on waking up, although he noted there was no sensory loss to the legs. Now he has some weakness of his upper limbs as well. He stated that he had mild weakness with some cramping of the legs one week prior to this.
Discuss the clinical evaluation, diagnostic work up and management of this patient

Short essays: (8x10=80)

2. Normal pressure hydrocephalus

3. WHO Pain Ladder

4. Pregnancy induced hypertension

5. Addison`s disease

6. Non motor manifestation of parkinsonism

7. Geriatric Giants

8 .Autoimmune haemolytic anaemia

9. Non-Alcoholic steato-hepatitis.

****

QP Code: **Reg.No:**

MD Degree Examinations in General Medicine (Model Question Paper)

Paper IV–Clinical Features (Clinical Medicine), Tropical Medicine, Recent Advances in General Medicine

Time: 3 hrs Max marks:100

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays:(20)

1. A 25 year-old woman developed fever, sore throat, poly arthritis, and progressive pallor of four weeks duration. On examination there was no organomegaly or jaundice. Haemogram showed Hb 5.6, TLC 14600, P90, L10, Platelet count 3.9lakhs and ESR 110. How do you proceed to evaluate this patient.
Discuss the management options, for the most likely diagnosis in this patient.

Short essays: (8x10=80)

2. DPP IV Inhibtors
3. Students T test
4. Management of lupus nephritis
5. Anti platelet drug resistance
6. New therapies for anaemia of chronic kidney disease.
7. Neuro toxic Snake envonamation
8. Targeted therapies in Medicine
9. The problem of malnutrition in India.

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

- *Clinical / Practical and Oral*

<u>Practicals</u>:

Long case- 1 x 150 = 150 marks

Short case- 3 x 50 = 150 marks

(2 short cases with 50 marks each and the third as spotter (Eg.Fundus examination, Dermatology case, Rheumatology case etc.)

or ward rounds

Total = 300 marks

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I.Rules No person shall be appointed as an internal examiner unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject. An external examiner shall ordinarily be appointed for not more than two consecutive terms. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. Out of internal examiners, one examiner shall be a professor and Head of Department or Head of Department.

3.10 Details of viva

Viva: 20 x 4 Examiners	**= 80 marks**
Logbook	**= 20 marks**
Total	**=100 marks**

4.INTERNSHIP

Not applicable for P.G. Medical degree courses.

5.ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerend Institution.

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE

IN MEDICINE

MD MICROBIOOGY

Course Code 207

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Microbiology

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.

- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Present in clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years. The course should be successfully completed within double the duration of the stipulated period of the course.

2.6 Subjects

- Bacteriology
- Mycobacteriology

- Immunology, Serology
- Virology
- Mycology
- Parasitology
- Hospital Infection Control
  The concept of Health Care counselling shall be incorporated in all relevent areas.

2.7 Total number of hours

- Bacteriology 10 months
- Immunology, Serology 7 months
- Virology 3 months
- Mycology 3 months
- Mycobacteriology including RNTCP 3 months
- Parasitology 2 months
- Special Postings: During second year: Hospital Infection Control including CSSD (1 month);
- Infectious Disease (1 month); ICTC & ART (2 weeks); Dermatology (STD) (2 week); Pathology (2 weeks); Transfusion Medicine (1 week); Community medicine (1 week)
- Molecular diagnostic and advanced technology including virology 1 month
- Review posting and Examinations 3 months

2.8 Branches if any with definition

As in clause 2.7

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

General Principles

Acquisition of practical competencies being the keystone of postgraduate medical education; postgraduate training is skill oriented. Learning in postgraduate program is essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

Teaching Sessions:

Introductory session of 1 month which offers training in research methodology, medical ethics and medicolegal aspects, involving the statistician, epidemiologist and research methodologist following which students undergoing post graduate courses shall be exposed to:

1. Basics of statistics to understand and critically evaluate published research paper
2. Few lectures or other type of exposure to human behavior studies
3. Basic understanding of pharmaco economics
4. Introduction to non linear mathematics

Teaching Schedule

The suggested departmental teaching weekly schedule is as follows:-

1. Seminar
2. Practicals
3. Journal club
4. Topic discussion
5. Thesis/Case Discussion

Posting

Section/Subject

- Bacteriology: 10 months
- Mycology: 3 months
- Immunology & Serology: 7 months
- Parasitology: 2 months
- Mycobacteriology & RNTCP: 3 months
- Virology: 3 months
- Molecular diagnostic and advanced technology including virology: 1 month
- Special posting:

Clinical postings

- Infectious disease: 1 month
- Transfusion Medicine: 1week
- Pathology: 2 weeks
- Central Sterilisation Department & Hospital Infection Control: 4 weeks
- Dermatology (STD): 2 weeks
- Community Medicine: 1 week

- ICTC & ART: 2 weeks

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Dissertation should be submitted six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research

Committee of the concerned institution. The synopsis shall be sent to within the first 6 months from the commencement of the course or as notified by the university in the calendar of events, to the Registrar .

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

General Principles

_ the assessment is valid, objective, and reliable.
_ it covers cognitive, psychomotor and affective domains.
_ Formative, continuing and summative (final) assessment is also conducted in Theory as well as practicals /clinicals. In addition, thesis is also assessed separately.

Formative Assessment

The formative assessment is continuous as well as end-of-term. The former is based on the feedback from the senior residents and the consultants concerned. End-of-term assessment is held at the end of each semester (upto the 5th semester). Formative assessment will not count towards pass/fail at the end of the program, but will provide feedback to the candidate.

1. Academic Activity: Performance during presentation at Journal club/ Seminar/ Case discussion and other academic sessions. Proficiency in skills as mentioned in job responsibilities.

2. End of term theory examinations conducted at the of 3rd year.

3. End of term practical/oral examinations after 2 years 9 months. Marks for **personal attributes** and **work done** should be given annually by all the consultants under whom the resident was posted during the year. Average of the three years should be put as the final marks out of 20. Marks for **academic activity** should be given by the all consultants who have attended the session presented by the residents. The Internal assessment should be presented to the Board of examiners for due consideration at the time of Final Examinations.

Job Responsibilities

During 1st year the resident will work under direct supervision of the consultants /Sr.Resident / 2nd yr & 3rd yr residents and will be responsible for handling and processing of the specimens in their respective sections. During 2nd yr, they will be responsible for reporting in their

respective sections under the supervision. During 3rd yr, they should be able to handle all the emergencies in the evening and night. All the junior residents should be able to take practical demonstrations for undergraduates.

2.10 Contents of each subject

Theory

General Microbiology

_ History of Microbiology
_ Microscopy
_ Bio-safety including universal precautions
_ Physical and biological containment
_ Sterilization and disinfection
_ Morphology of bacteria and other microorganisms
_ Nomenclature and classification of microorganisms
_ Normal flora of human body
_ Growth & nutrition of bacteria
_ Bacterial metabolism
_ Bacterial toxins
_ Bacteriocins
_ Microbiology of hospital environment
_ Microbiology of air, milk and water
_ Host-parasite relations
_ Antibacterial substances and drug resistance, antibiotic stewardship
_ Bacterial genetics & bacteriophages
_ Molecular genetics relevant for medical microbiology
_ Quality assurance & quality control in microbiology
_ Accreditation of laboratories

Immunology

_ Components of the immune system
_ Innate and acquired immunity
_ Cells involved in immune response
_ Antigens
_ Immunoglobulins
_ Mucosal immunity
_ Complement
_ Antigen & antibody reactions
_ Hypersensitivity
_ Humoral & Cell mediated immunity

_ Cytokines
_ Immunodeficiency
_ Auto-immunity
_ Immune tolerance
_ MHC complex
_ Transplantation immunity
_ Tumor immunity
_ Vaccines and immunotherapy
_ Measurement of immunological parameters
_ Immunological techniques
_ Immunopotentiation & immunomodulation

Systematic bacteriology

_ Isolation & identification of bacteria
_ Gram positive cocci of medical importance
_ Gram negative cocci of medical importance
_ Gram negative and positive bacilli of medical importance,
_ Anaerobic bacteria of medical importance
_ Mycobacteria
_ Spirochaetes
_ *Chlamydiae*
_ Mycoplasmatales: *Mycoplasma, Ureaplasma, Acholeplasma* and other Mycoplasmas.
_ Rickettsiae, Coxiella, Bartonella

Virology

_ General properties of viruses
_ Classification of viruses
_ Morphology: Virus structure
_ Virus replication
_ Isolation & identification of viruses
_ Pathogenesis of viral infections
_ Genetics of viruses
_ DNA viruses of medical importance including Poxviridae, Herpesviridae, Adenoviridiae, Hepadna virus, Papova and Parvo viruses etc.
_ RNA viruses of medical importance including Enteroviruses, Togaviridae, Arboviruses, Orthomyxoviruses, Paramyxoviruses, Reoviridiae, Rhabdoviridae, Arenaviridae, Bunyaviridae, Retroviridae, Filoviruses, Human immunodeficiency virus, Arboviruses, Coronaviridae, Caliciviruses etc.
Slow viruses including prions

_ Unclassified viruses
_ Hepatitis
_ Viriods
_ Viral vaccines & anti-viral drugs

Parasitology

_ General characters & classification of parasites
_ Methods of identification of parasites in the laboratory.
_ Protozoan parasites of medical importance
_ Helminthology of medical importance
_ *Entomology:* common arthropods & other vectors
_ Antiparasitic agents.

Mycology

_ General characteristics, classification, morphology and reproduction of fungi
_ Isolation & identification of fungi
_ Tissue reactions to fungi
_ Yeasts, yeast like fungi and filamentous fungi of medical importance
_Common laboratory contaminant fungi
_ Mycetism & mycotoxicosis
_ Antifungal agents & invitro antifungal susceptibility tests.

Applied Microbiology

_ Epidemiology of infectious diseases
_ Hospital acquired infections
_ Management of hospital waste
_ Investigation of an infectious outbreak
_ Infections of various organs and systems of human body and their lab diagnosis viz. respiratory tract infections, urinary tract infections, central nervous system infections, congenital infections, reproductive tract infections, gastrointestinal infections, hepatitis, pyrexia of unknown origin, infections of eye, ear & nose, skin & wound infections septicemia, endocarditis, haemorrhagic fever etc.
_ Opportunistic infections.
_ Sexually transmitted diseases
_ Vaccinology: principle, methods of preparation, administration of vaccines
_ Molecular techniques as applicable to microbiology
_ Epidemiological typing techniques

_ Automation in Microbiology
_ Statistical analysis of microbiological data and research methodology
_ Animal & human ethics involved in microbiological work
_ Hospital Infection Control

Recent Advances in Medical Microbiology

Practical

Bacteriology

_ Aseptic practices in laboratory and safety precautions
_ Collection/transport of specimens for microbiological investigations
_ Preparation, examination & interpretation of direct smears from clinical specimens
_ Plating of clinical specimens on media for isolation, purification, identification and quantitation purposes.
_ Preparation of stains viz. Gram, Albert's, capsules, spores, Ziehl Neelsen (ZN)
_ Preparation of media like Nutrient agar, Blood Agar, Mac-conkey agar, Sugars, Serum sugars, , Robertson's cooked meat broth, Lowenstein Jensen medium, Sabouraud's dextrose agar etc.
_ Preparation of oxidase reagent , Kovac reagent etc.
_ Quality control of media, reagents etc.
_ Operation of autoclave, hot air oven, distillation plant and filters
_ Care and operation of microscopes
_ Washing and sterilisation of glassware (plugging and packing)
_ Care and maintenance of common laboratory equipments like water bath, centrifuge, refrigerators, incubators etc.
_ Sterility tests
_ Identification of bacteria of medical importance upto species level
_ Techniques of anaerobiosis
_ Tests for Motility: hanging drop,
_ Special tests-Bile solubility, CAMP test, satellitism, catalase, oxidase, slide & tube agglutination tests etc,.
_ Preparation of antibiotic discs; performance of antimicrobial susceptibility testing, eg. Kirby-Bauer, Stoke's method, Estimation of Minimal Inhibitory/Bactericidal concentrations by tube/ plate dilution methods
_ Tests for Beta-lactamase production
_ Bleeding techniques of animals including, rabbit .
_ Care and breeding of laboratory animals viz. mice, rabbits / guinea pigs
_ Testing of disinfectants
_ Quantitative analysis of urine by pour plate method and semi quantitative analysis by standard loop tests for finding significant bacteriuria

_ Disposal of contaminated materials like cultures
_ Disposal of infectious waste
_ Bacteriological tests for water, air and milk
_ Maintenance & preservation of bacterial cultures
_ Serologic grouping of Streptococci
_ Antimicrobial susceptibility tests for Mycobacteria

Immunology

_ Collection of blood by venipuncture, separation of serum and preservation of serum for short and long periods.
_ Performance of serological tests viz. Widal, Brucella tube agglutination, RPR Enzyme linked immunosorbent assay
_ Latex agglutination tests

Mycology

_ Collection and transport of specimens
_ Processing of samples for microscopy and culture
_ Direct examination of specimens by KOH, Gram's, Acid fast, Giemsa, Lactophenol cotton blue & special fungal stains
_ Examination of histopathology slides for fungal infections
_ Isolation and identification of medically important fungi & common laboratory contaminants
_Slide culture
_ Maintenance of stock cultures
_ Antibody detection in candidiasis, aspergillosis, Cryptococcosis, zygomycosis,
_Antigen detection in cryptococcosis.

Parasitology

_ Collection and transport of specimens for diagnosis of parasitic diseases
_ Examination of faeces for parasite ova and cysts etc. by direct and concentration methods (salt floatation and formol-ether methods)
_ Examination of blood for microfilariae including concentration techniques
_Preparation & performance of stains -Leishman, Giemsa, Lugol's iodine
_ Micrometry
_ Identification of medically important adult worms

Virology

_ Preparation of glassware for tissue cultures (washing, sterilisation).

_ Preparation of clinical specimens for isolation of viruses
_ Collection & transport of specimens
_ Serological tests -ELISA for HIV & HBsAg etc
_ Chick Embryo techniques-inoculation and harvesting
_ Handling of mice, rabbits / guinea pigs for collection of blood.

2.11 No: of hours per subject

Seminar:	one and a half hours per week,
Practical exercise discussion:	one and a half hours per week
Journal club:	one and a half hours per week
Topic discussion:	one and a half hours per week
Thesis/Case Discussion:	one and a half hours per week

2.12 Practical training

- Three hours daily
- Afternoon hours should be used for training undergraduate students (theory and practical)

2.13 Records

Log book to be maintained to record daily practical work and to be signed by the faculty in charge of Lab.

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On

evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Mentioned under Section 9 Clinical posting.

In colleges without facility for Molecular diagnostic techniques and Virology techniques, candidates have to acquire training from Centres having such facilities

2.16 Project work to be done if any

Dissertation as approved by the IRC and Ethical Committee

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

- Microbiology in Clinical Practice - D.C.Shanson
- Ananthanarayan and Panikers Text Book of Microbiology
- Medical Microbiology - Jawetz, Melnick and Adelbergs
- Medical Microbiology – David Greenwood, Richard C.B.Slack, John F. Peutherer
- Diagnostic Microbiology - Bailey & Scotts
- Mackie & Mc Cartney Practical Medical Microbiology (vol I & II)
- Immunology - Richard A .Goldsby, Thomas J.Kindt, Barbara A.Osborne., Janis Kuby
- Parasitology - K.D. Chatterjee
- Textbook of Medical Parasitology – C.K. Jayaram Paniker
- Text book of Medical Parasitology – Subhash Chandra Parija

- Practical guide to diagnostic Parasitology – Lynne S. Garcia.
- Manual of Clinical Mycology – Norman F. Conant, David Tillerson Smith, Roger denio Baker and Jasper Lamar Callaway
- Medically important fungi – A guide to identification – Davise H .Larone
- Principles and practice of clinical Mycology – Kibbler C.C., D.W.R. Mackensie and F.C. Odds
- Principles and practice of Infectious Diseases Vol 1 and 2 Mandell, Douglas and Bennett

2.19 Reference books

- Microbiology and Microbial Infection (Vol I- VI) - Topley & Wilson
- Colour Atlas & Text Book of Diagnostic Microbiology - Koneman
- Immunology - Ivan Roitt
- Fundamentals of diagnostic Mycology - Fran Fisher, Norma B. Cook
- Text Book of Mycology - Rippon
- Fields Virology - David M.Knipe, Peter M.Howley
- Harrisons Principles of Internal Medicine

2.20 Journals

- Indian Journal of Medical Microbiology
- Indian Journal of Medical Research
- Clinical Microbiological Reviews
- Journal of Hospital Infection
- Lancet (ID)
- North American Clinics of Infectious Diseases

- Review of Infectious Diseases
- Tuberculosis
- Indian Journal of Tuberculosis
- Journal of Tropical Medicine
- Emerging Infectious Diseases (EID)
-
- Journals of ASM

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3.EXAMINATIONS

3.1 Eligibility to appear for exams

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- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers of 100 marks each.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40										
2	Paper II	100	40										
3	Paper III	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

Theory – 4 papers of 100 marks each. -Duration. . 3hrs
One long essay-20 marks, eight short essays of 10 marks each/ paper

Paper I-General Microbiology & Immunology
Paper II- Bacteriology & Mycology
Paper III- Virology & Parasitology
Paper IV- Applied Microbiology & Recent Advances

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No:**

MD Degree Examinations in Microbiology
(Model Question Paper)
Paper I – General Microbiology & Immunology
Time: 3 hrs Max marks:100
Answer all questions
Draw diagrams wherever necessary

Essay: (20)

1. Discuss genetic basis of drug resistance in bacteria

Short essays: (8X10=80)

2. Enlist important primary immunodeficiency diseases. Describe DiGeorge's syndrome.
3. What are histocompatibility antigens. Discuss HLA typing.
4. What is microarray. Describe its principle and applications in microbiology.
5. Explain hybridoma technology and give its applications in microbiology.
6. What is redox potential. Describe giving suitable examples.
7. Enumerate various tests used for determining the efficacy of disinfectants. Discuss briefly the phenol-coefficient test.
8. Differentiate between classical and alternate pathways of complement activation. Discuss the role of complement in various serological tests
9. Categorize pathogens according to hazard and categories of containment. Discuss various types of microbiological biosafety cabinets.

QP Code: **Reg.No:**

MD Degree Examinations in Microbiology
(Model Question Paper)
Paper II – Bacteriology and Mycology
Time: 3 hrs Max marks:100
Answer all questions
Draw diagrams wherever necessary

Essay: (20)

1. Discuss the laboratory diagnosis of antibiotic associated diarrhea.

Short essays: (8X10=80)

2. Discuss etiology, pathogenesis and laboratory diagnosis of Weil's disease.
3. What are PBP's. Discuss their role in drug resistance.
4. Discuss briefly GISA.
5. Explain the mechanism of action and methods of detection of enterotoxin
6. Discuss etiology, pathogenesis and laboratory diagnosis of Cat Scratch Disease.
7. Enumerate various dematiaceous fungi and discuss their pathogenicity.
8. What are mycotoxins . Discuss mycotoxicosis.
9. Classify antifungal agents. Discuss the methodsof anti-fungal susceptibility testing.

QP Code: **Reg.No:**

MD Degree Examinations in Microbiology
(Model Question Paper)
Paper III – Virology & Parasitology.
Time: 3 hrs Max marks:100
Answer all questions
Draw diagrams wherever necessary

Essay: (20)

1. Name various pathogenic free living amoebae. Discuss the life cycle, pathogenicity, clinical features and laboratory diagnosis of any one of them.

Short essays: (8X10=80)

2. Discuss rapid diagnostic tests in parasitology along with their clinical applications.
3. Enlist and discuss laboratory diagnosis of opportunistic parasitic infections in immunocompromised patients.
4. Discuss the etiology, pathogenesis and diagnosis of Tropical Pulmonary Eosinophilia.
5. Classify oncogenic viruses and explain the various mechanisms of viral oncogenesis.
6. What are Interferons. Explain their mechanism and clinical applications.
7. Discuss etiology, pathogenesis and laboratory diagnosis of viral hemorrhagic fever.
8. Define Prions. Classify Prion diseases and discuss their pathogenesis and diagnosis.
9. Enumerate various congenital viral infections and discuss their laboratory diagnosis.

QP Code: **Reg.No:**

MD Degree Examinations in Microbiology
(Model Question Paper)
Paper IV – Applied Microbiology and Recent Advances in Microbiology
Time: 3 hrs Max marks:100
Answer all questions
Draw diagrams wherever necessary

Essay: (20)

1. What are edible vaccines. Discuss the current status and future of edible vaccines.

Short essays: (8X10=80)

2. What is flow cytometry. Give its principle and uses in clinical microbiology.
3. Define transgenic mice and discuss its role in study of microbial pathogenicity.
4. What is the role of microbiologist in Hospital Infection Control Committee.
5. What is quality control. Describe various methods adopted for internal quality control in microbiology.
6. Discuss the emerging and reemerging bacterial infections.
7. What are biofilms. Describe their significance in clinical microbiology.
8. Discuss PEP in case of needle stick injury.
9. Define and categorize biomedical waste. Discuss its management

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practical exams

Clinical / Practical and Oral

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Practical

Exercise	Marks
A.Bacteriology	**120**
1. Pure culture 2. Clinical specimen (mixture) 3. Serology	30 60 30
B.Virology **Clinical Virology – ELISA and Rapid tests**	**50**
C.Mycology	**35**
1. Three Fungal isolates to identify 2. Slide culture	30 5
D.Parasitology- Stool examination, concentration	**20**
E.Spotters	**30**
F.OSPE – Two stations of 10 marks each	**20**
G.Pedagogy	**25**
Total Practicals	**300**
Log book	**20**
Viva voce	**80**
Total Viva voce	**100**

Day wise distribution of exercises

Day 1	Day 2	Day 3
Clinical Microbiology	Clinical Microbiology	Clinical Microbiology
Pure Culture	Pure Culture	Pedagogy
Mycology	Parasitology	Viva voce
Serology	OSPE	
Virology	Spotters	

OSPE

1. Hand washing

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2. Biomedical waste management
3. Media pouring
4. Catheter urine sample collection
5. In use test
6. Modified Acid fast staining
7. Albert's staining
8. Animal handling
9. Egg inoculation

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

Viva: 20 x 4 Examiners = 80 marks
Logbook = 20 marks
Total =100 marks

4.INTERNSHIP

Not applicable for P.G. Medical degree courses.

5.ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerend Institution.

REGULATIONS 2016

Syllabus

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD PATHOLOGY

Course Code 208

(2016-17 Academic year onwards)

2016

2.COURSE CONTENT

2.1 Title of course:

M.D. Pathology

2.2 Objectives of course

GOAL

The purpose of this programme is to standardize MD Pathology training at Post Graduate level throughout KERALA. This inducts uniformity in undergraduate teaching as well, and creates suitable manpower with appropriate expertise in an advanced laboratory Diagnostics

Specific objectives

A candidate passing the MD Pathology Examination should be able to:

1) Attain proficiency in both theoretical and practical aspects of the areas of Histopathology, Cytopathology, Haematology, Immunopathology, and Molecular pathology.

2) They are expected to be able to conduct diagnostic procedures (eg: FNAC), interpret and offer an opinion /recommendation where required independently in a Specialist and Routine lab setting.

3) They must be able to oversee the technical staff and ensure that recommended procedures are followed in collection of samples, registering, processing, reading and interpreting the tests performed.

General objectives

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.

- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.

- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Active learning and **Problem based learning**, should form the mainstay of postgraduate training in Pathology. Work to learn and learn to work is the Motto. It should include seminars, symposia, group-discussions, and journal clubs along with lectures. Each college should have a Medical Education Unit / Institutional Research committee to conduct the PG orientation programme and research methodology workshop.

The three year training programme for MD Pathology may be arranged in the form of postings to different assignments / laboratories for specified periods as given below. The period of such assignments / postings is recommended for 36 months. During this period the postgraduate should attain skills pertaining to basic and applied Pathology. Posting schedule may be modified depending on needs, feasibility and exigencies and the Student is expected to see the new cases, work up cases and recognize them whenever possible, and present the cases before the consultant in the various divisions (Histopathology, Hematology, Cytopathology etc)

Total duration – 36 months

1. Surgical Pathology and Histopathology — 12 months (4 months 1st and 3rd year 3 months in 2nd year)
   Immunohistochemistry Methods, — two weeks (2nd Year)
   Immunoflourescence, Methods — two weeks (2nd Year)
2. Hematology including Clinical Pathology — 9 months (3 months 1st and 3rd year 2 months in 2nd year)
   Cytogenetics, Molecular Pathology, — two weeks (2nd Year)
   Flowcytometry, Electron microscopy (desirable) — two weeks (2nd Year)
   Cytopathology — 9 months (3 months each year)
3. Blood bank — 2 months (1 month in 2nd and 3rd year)
4. Autopsy & museum techniques — 3 months (1 month each year)
5. Ancillary postings — 1 month (15 days in each subject
   Biochemistry & Microbiology — during the **1st or 2nd year**)

The Post Graduate thesis work, internal assessment, attending conferences and presenting papers/cases, are mandatory requirements in training and has to be facilitated by the institutions.

Attendance in 3 Conferences or CME, and presentation of at least one paper or case report is an essential requirement during the 36 months of training. Publishing papers is a desirable requirement.

The Thesis protocol should have approval (by the KUHS) and has to be registered with the KUHS. The Thesis has to be submitted 6 months before the commencement of the Final Theory examinations and should be accepted by the KUHS. This is a mandatory requirement for eligibility to appear for the Examination.

The students will have regular scientific discussions and evaluation during these postings in the form of

- Subject seminars and symposia including techniques
- Slide seminars
- Specimen & Slide discussions
- Topic presentations
- Journal club
- Clinic-pathological conferences
- Periodic examinations

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

1. Surgical Pathology and Histopathology
    a. Immunohistochemistry Methods,
    b. Immunoflourescence, Methods

2. Hematology including Clinical Pathology
    a. Cytogenetics, Molecular Pathology,
    b. Flowcytometry, Electron microscopy

3. Cytopathology

4. Blood bank and Transfusion Medicine

5. Autopsy & museum techniques

6. Ancillary postings Biochemistry & Microbiology

The concept of Health Care counselling shall be incorporated in all relevent areas.

2.7 Total number of hours

Present in clause 2.10

2.8 Branches if any with definition

Not Applicable

2.9 Teaching learning methods

Specific Teaching learning methods

Active learning and **Problem based learning**, should form the mainstay of postgraduate training in Pathology. Work to learn and learn to work is the Motto. It should include seminars, symposia, group-discussions, and journal clubs along with lectures. Each college should have a Medical Education Unit / Institutional Research committee to conduct the PG orientation programme and research methodology workshop.

GeneralTeaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Method of Training

- The Postgraduate students shall attend all the Undergraduate Theory and Practical Classes regularly.
- They shall take part in teaching undergraduate students in gross anatomy, histology tutorials, group discussions and seminars.
- Rotation postings of PG students shall be made during the II and III years of the course At the end of the posting, a certificate has to be obtained from the concerned heads of the departments for satisfactory learning.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to within the first 6 months from the commencement of the course or as notified by the University.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

2.10 Content of each subject in each year

A) Theory

- General Pathology including Immunopathology
- Systemic Pathology
- Hematology and Laboratory medicine
- Cytopathology
- Blood banking including Transfusion Medicine
- Cytogenetics and Molecular Pathology
- Autopsy Pathology
- Laboratory organization including quality control
- Recent advances in Pathology and related subjects including applied aspects

B) Practical Education including Techniques and their application

Histopathology

- Histopathology techniques including specimen collection, grossing of specimens, fixation, tissue processing, section cutting, H&E staining, special stains, immunohistochemistry and frozen sections.
- Interpretation of H&E slides, special stains, immunohistochemistry and frozen sections of normal and abnormal tissues of all organs.

Hematology and Clinical pathology

- Sample collection
- Preparation of Leishman stain and reagents for blood counts
- Hands on experience in Hb estimation, RBC, WBC, Platelet and Reticulocyte counts, red cell indices, absolute eosinophil count, PCV and ESR.
- Preparation and interpretation of peripheral smear and bone marrow smears and interpretation of trephine biopsy.
- Cytochemistry including myeloperoxidase, Sudan black B, PAS, NSE and Perl's stain.
- Hemolytic anemia workup including sickle cell screening tests, HbF quantitation, osmotic fragility, acid elution test, Hb electrophoresis, QBC.
- Work up of a bleeding disorder with hands on experience on primary screening tests and interpretation of the results of confirmatory tests.
- Use of automated blood cell counters including quality control
- Urine analysis
- Semen analysis
- Stool examination
- Pregnancy test
- Cleaning of glassware
- Universal precautions
- Waste disposal

Blood banking

- Blood grouping and typing
- Cross matching
- Rh antibody titration
- Coomb's testing
- Blood collection and donor screening
- Tests for HIV, Hepatitis B and C, STS

- Cold agglutinin test
- Blood component preparation
- Quality control

Cytopathology

- Collection and processing of cytology samples
- Fine needle aspiration cytology – procedure, staining and interpretation
- Cytology of other fluids – staining and interpretation

Autopsy Pathology

- Procedure of a complete autopsy
- Handling of the specimens and its processing
- Interpretation of the macroscopy and microscopy of lesions and correlation of the findings
- Writing of the final anatomical diagnosis.

Clinical Biochemistry

- Biochemistry applied to biochemical investigations
- Basic clinical chemistry

Microbiology

- Identification of pathogenic bacteria ,fungi and parasites
- Interpretation of special stains helpful to identify common organisms

2.11 No: of hours per subject

Weekly Schedule

The schedule may be revised as per needs of the institution

	Mon	Tue	Wed	Thurs	Fri	Sat	
Lecture	8 - 9.30AM	8 - 9.30AM					3 hrs
T utorial				2- 4PM			2 hrs
Seminars			8- 10 AM		2- 4.00		4hrs
Group discussion				8- 10 AM			2hrs
CPC						12 Noon to 1PM	1 hr
WEEKLY ***The Timings and days may be changed as is convenient to individual institutions. This only a general guide line to indicate minimum hours of the items. Can be more.*** ***Shaded areas =Rest of the Hrs are meant for practical work.*** ***Please note that the PG students are RESIDENTS and the Hours shown above indicates the specific programmes only.***							12 hrs

2.12 Practical training

Have to be in the assigned Lab, " Working and Learning". Minimum Scheduled hours will be the official "start and finish" of daily work in the lab or Department. the Resident is expected to follow instructions of the Faculty and duly get the log book signed

2.13 Records

Present in Clause 2.21.

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

The Training may be imparted at the home center establishments or at a Higher center (eg: RCC Tvpm, SCT Tvpm , etc to name two)

Immunoflourescence, Methods	two weeks (2nd Year)
Cytogenetics, Molecular Pathology,	two weeks (2nd Year)
Flowcytometry, Electron microscopy	two weeks (2nd Year)

2.16 Project work to be done if any

Project is not compulsory . Project work may be taken up with the permission and concurrence of the Head of Department and Institution. It should not have any conflict of interest with the Thesis work.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

General pathology -Latest edition of Robbins –Essential Other standard General pathology Books, Systemic Pathology – WHO fascicles - Essential

2.19 Reference books

Monographs in pathology

Annual Reviews in Histopathology

Recent Advances in Histopathology

2.20 Journals

All Standard Journals

Eg: Histopathology, Archives of Pathology and Lab medicine, AJSP,

This only a general guide line to indicate the type of books and Journals of the items. Depends on what is available in each Institution. Online Journals may be used.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3 EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.

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- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

EXAMINATION

- University exam shall be held within the three years of training 35th or 36th month
- **Theory**: There shall be four theory papers of 100 marks each. They are
    1. Paper I: General Pathology
    2. Paper II: Hematology and Laboratory Medicine
    3. Paper III: Systemic Pathology
    4. Paper IV: Recent advances

    Each Theory Paper will have One Essay of 20 marks and 8 short essays of 10 marks each

- **Practical examination** can be conducted for a maximum of 6 candidates at a time. Each exam shall be of a minimum of two days.
- **Viva voce** will be held at the end of practical examination for a total of 40 marks out of which 10 marks will be allotted for the evaluation of the log book.
- The aspects to be covered with the allotment of marks is as follows:

THEORY				
	Marks secured	Minimum marks for Pass in each Paper	Maximum marks in each Paper	
Paper 1		40	100	
Paper 1		40	100	
Paper 1		40	100	
Paper 1		40	100	
Total		200 (50%)	400	
PRACTICALS AND VIVA VOCE				Failed / Passed
Practicals		150 (50%)	300	
Viva Voce		No Minimum	100	
		200 (50%)	400	

No	Exercise	Marks
1	Techniques in Pathology including Cytology and Histopathology	20
2	Grossing of specimens (minimum 1)	20
3	Identification of gross specimens (12 specimens with a minimum of 9)	60
4	Clinical Pathology exercises	20
5	Autopsy	25
6	Hematology and cytology slides (minimum of 15 slides)	75
6	Histopathology slides (minimum of 15 slides)	75
7	Pedagogy	5
	PRACTICALS	**300**
	VIVA VOCE	**100**
	TOTAL	**400**

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

- University exam shall be held within the three years of training 35th or 36th month
- **Theory**: There shall be four theory papers of 100 marks each. They are

- Paper I: General Pathology
- Paper II: Hematology and Laboratory Medicine
- Paper III: Systemic Pathology
- Paper IV: Recent advances

Each Theory Paper will have One Essay of 20 marks and 8 short essays of 10 marks each

- **Practical examination** can be conducted for a maximum of 6 candidates at a time. Each exam shall be of a minimum of two days. The aspects to be covered with the allotment of marks is as follows

No	Exercise	Marks
1	Techniques in Pathology including	20
2	Grossing of specimens (minimum 1)	20
3	Identification of gross specimens (12 specimens with a minimum of 9)	60
4	Clinical Pathology exercises	20
5	Autopsy	25
6	Hematology and cytology slides (minimum of 15 slides)	75
6	Histopathology slides (minimum of 15 slides)	75
7	Pedagogy (microteaching)	5
	TOTAL	**300**

- **Viva voce** will be held at the end of practical examination for a total of 50 marks out of which 10 marks will be allotted for the evaluation of the log book.
-

COMPLETION OF THE COURSE

The course will be deemed to have been completed only after the student completes the prescribed 36 months inclusive of the eligible leaves and should be certified by the Head of Department and the (Dean or) the Principal of the institution (Both certification essential)

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300	150	100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

4 papers, each 3 hours duration with one structured long essay carrying 20 marks and eight short essays carrying 10 marks each.

- Paper I: General Pathology
- Paper II: Hematology and Laboratory Medicine
- Paper III: Systemic Pathology
- Paper IV: Recent advances

3.6 Model question paper for each subject with question paper pattern

Paper – I: GENERAL PATHOLOGY, PATHOPHYSIOLOGY, IMMUNOPATHOLOGY AND CYTOPATHOLOGY

Time: 3 Hours Max. Marks: 100

Instructions: 1) Answer all questions.

2) Illustrate wherever necessary

I. Define Apoptosis. Discuss in detail the Pathophysiology, biochemical Features and mechanisms of Apoptosis. (20 marks)

II Write short notes on:

a) Complications of cutaneous wound healing

b) Factor V Leiden

c) Liquid based cytology

d) Mechanisms involved in transplant rejection

e) Oncogenes and associated human tumors

f) Pathogenesis of Septic shock

g) Role of Adhesion molecules in inflammatory response

h) Role of stem cells in tissue homeostasis. (8x10 = 80 Marks)

****

Paper - II: SYSTEMIC PATHOLOGY
Time: 3 Hours Max. Marks: 100
Instructions: 1) Answer all questions.
2) Illustrate wherever necessary

I. Classify and enumerate different types of vasculitides. Discuss in detail the pathology and laboratory diagnosis of immune mediated vasculitides. (20marks)

II Write short notes on:

a) Auto immune hepatitis

b) Cryptogenic organising pneumonia

c) Gestational trophoblastic diseases

d) Intestinal metaplasia

e) Metaplastic carcinoma of breast

f) Pathogenesis of type 1 diabetes mellitus

g) Rapidly progressive glomerulonephritis

h) Thymomas (8x10 = 80 Marks)

****

Paper – III: HAEMATOLOGY, TRANSFUSION MEDICINE (BLOOD BANKING) AND LABORATORY MEDICINE

Time: 3 Hours Max. Marks: 100

Instructions: 1) Answer all questions.

2) Illustrate wherever necessary

I Discuss in detail the various modern laboratory procedures used in the Diagnosis, differential diagnosis and prognosis of acute leukaemias. (20marks)

II. Write short notes on:

a) Acquired Coagulopathies

b) Alloimmune thrombocytopenia

c) Biomedical waste disposal in Pathology Lab

d) Blood components separation and uses

e) Gel method in blood grouping and cross matching

f) Herediatary disorders of red cell permeability

g) Serum transferrin receptor assay

h) Thermoelastography (T.E.G). (8x10=80 Marks)

****

Paper – IV: RECENT ADVANCES AND APPLIED ASPECTS
Time: 3 Hours Max. Marks: 100
Instructions: 1) Answer all questions.
2) Illustrate wherever necessary

I. Discuss in detail the recent trends in the diagnosis, differential

Diagnosis and grading of small round cell tumours. (20 marks)

II Write short notes on:

a) Endometrial intra epithelial neoplasia

b) Iron induced mucosal pathology of upper G.I tract

c) Ki 67 index

d) Male breast carcinogenesis

e) Patterns of liver infiltration in immunoproliferative disease

f) Role of TFE3 (transcription factor E3) in PEComa.

g) Skin biopsy in the diagnosis of peripheral neuropathy

h) Tissue micro array technology in breast cancer (8x10 = 80 Marks)

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practical exams

In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva:

Present in clause 3.3 of the curriculum.

4.INTERNSHIP

Not applicable for P.G. Medical degree courses.

5.ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerend Institution

Template for Dissertation
Provided in the University website.

Template for Mark List showing Maximum & Minimum
As per Scheme of Examination.

FORMAT OF LOG BOOK for MD Pathology

DEPARTMENT OF PATHOLOGY

MD PATHOLOGY POST GRADUATE COURSE LOG BOOK

(AFFLIATED TO THE KERALA UNIVERSITY OF HEALTH AND ALLIED SCIENCES)

Name of the Candidate :

Year of Admission :

University
Registration No. :

CERTIFICATE OF RECORD OF POSTGRADUATE TRAINING

Certified be the bonafide record of work done by
Dr……
……

For the period from …… to
…… during the Post graduate course in MD Pathology done at ----------

Date of Submission :

Signature of candidate:

Photo

University
Registration No : TCMC Registration No :

Signature & Seal of HOD Signature & Seal of Principal.

Bio Data of the Candidate

1. Experience before Joining P.G.COURSE

2. Details of posting
    - First year
    - Second year
    - Third year
3. Thesis research work
4. Participation conferences- CME programmers'
5. Details of leave availed
6. Details of participation in academic programme
7. Seminars/Symposium presented
8. Statistical meetings/Departmental mortality meetings
9. Journal clubs
10. Teaching assignments – Under graduates/ Nurses/ Paramedical
11. Special duties (If any)
12. Internal assessment
13. Miscellaneous
14. Daily activities record (Blank pages)
    One Page for each month X 36 pages
15. Summary

OVERVIEW OF POSTING OF THE TRAINING PERIOD

Year of course	From	To	Posting
Ist Year IInd Year IIIrd year			

INDEX OF ACADEMIC LEARNING ACTIVITIES

ACTIVITY	PAGE NUMBER
Autopsy technique	
Autopsy Training	
Blood Bank – Interesting cases	
Blood bank Techniques	
Clinical Biochemistry	
Clinical Microbiology	
Clinical Pathology –Interesting cases	
Clinical pathology –Techniques	
Clinicopathological conferences	
CME/ Workshop/Conferences- paper/ Poster Presentations	
CME/ Workshop /Conferences /Guest Lectures-Attended	

Cytopathology –Interesting Cases	
Cytopathology –Techniques	
Dermatopathology Training	
Haematology technique	
Haematology interesting cases	
Histopathology- Gross Sessions	
Histopathology –Interesting cases	
Histopathology – Techniques	
Grossing and Resection	
Intra-operative Diagnosis : Imprint / Frozen Section	
Immunohistochemistry	
Journal Club	
Mortality Meeting	
Museum techniques	
Orientation Posting	
OSPE Discussions	
Out station postings	
Panel Discussions	
Paper Publications/ Presentations	
Slide Seminar	
Subject Seminar – Presentations	
TLE –HRD Workshops Attended	
UG –List of theory Classes taken	
UG –list of practical classes taken	
Other activities	

ORIENTATION PROGRAMME

S.No	Date	POSTING IN Different divisions of central Lab and other departments.		Signature of Faculty / supervisor
		Gross anatomy and histology		
		Reception of specimens for different investigations		
		Sample collection centre in central lab		
		Department of transfusion medicine .		
		Clinical Biochemistry		
		Clinical Microbiology		

AUTOPSY TECHNIQUES

S.No	Date			Signature of Faculty / supervisor

AUTOPSY TRAINING

☆

S.No	Date		Your role	Signature of Faculty/ supervisor

BLOOD BANK – INTERESTING CASES

S.No	Date	Summary of findings & Diagnosis	Your role	Signature of Faculty /supervisor

BLOOD BANK TECHNIQUE

S.No	Date	Name of technique	Your role	Signature of Faculty / supervisor

CLINICAL BIOCHEMISTRY

S.No	Date		Your role	Signature of Faculty/ Supervisor

CLINICAL MICROBIOLOGY

S.No	Date		Your role	Signature of Faculty/ Supervisor

CLINICAL PATHOLOGY – INTERESTING CASES

S.No	Date	Summary of findings & Diagnosis	Your role	Signature of Faculty/ Supervisor

CLINICAL PATHOLOGY – TECHNIQUES

S.No	Date	Name of technique	Your role	Signature of Faculty/ Supervisor

CLINICOPATHOLOGICAL CONFERENCES

S.No	Month	Department involved & List of cases discussed	Your role Presented Participated	Signature of Faculty / Supervisor

CME / WORKSHOPE /CONFERENCE –Paper /Poster Presentations

S.No	Date	Title of paper / Poster	Details of the event (Name, Venue, dates etc)	Signature of Faculty /supervisor

ENDORSEMENT BY HOD

CME / WORKSHOPS/ CONFERENCE / Guest lectures- Attended

S.No	Date	Details of the event (Name, venue, dates, speaker etc.)	Signature of H.O.D

CYTOPATHOLOGY – Interesting cases

S.No	Date	Summary of findings & Diagnosis	Your role	Signature of Faculty/ supervisor

CYTOPATHOLOGY – TECHNIQUES

S.No	Date	Name of the technique	Your role	Signature of Faculty/ supervisor

DERMATOPATHOLOGY TRAINING

S.No	Date	Summary of clinical details / Clinical findings and Microscopic findings	Your role	Signature of Faculty/ supervisor

ENDORSEMENT BY H.O.D

HAEMATOLOGY – TECHNIQUES

S.No	Date	Name of the technique	Your role	Signature of Faculty/ supervisor

HAEMATOLOGY – Interesting cases

S.No	Date	Summary of findings & Diagnosis	Your role	Signature of Faculty / supervisor

Histopathology - Gross sessions

S.No	Date	Summary of findings & Diagnosis	Your role	Signature of Faculty/ supervisor

HISTOPATHOLOGY – Interesting Cases

S.No	Date	Summary of findings & Diagnosis	Your role	Signature of Faculty/ supervisor

HISTOPATHOLOGY TECHNIQUES

S.No	Date	Name of the technique	Your role	Signature of Faculty/ Supervisor

Intra-Operative Diagnosis : Imprint / Frozen Section

S.No	Date	Summary of findings and diagnosis	Your role	Signature of Faculty/ Supervisor

IMMUNOHISTOCHEMISTY

S.No	Date	Summary of IHC findings and diagnosis	Your role	Signature of Faculty/ Supervisor

JOURNAL CLUB

S.No	Date	Details of the topic discussed (Title authors and information on its source	Your role Presented Participated	Signature of HOD

MORTALITY MEETING

S.No	Date	Summary of findings & Diagnosis of the case that was	Your role	Signature of

		discussed		Faculty/ supervisor

MUSEUM TECHNIQUES

S.No	Date		Your role	Signature of Faculty/ supervisor

ENDORSEMENT BY H.O.D

ORIENTATION POSTING

S.No	Date		Your role	Signature of Faculty/ supervisor

OSPE DISCUSSION

S.No	Date	Summary of findings & Diagnosis	Your role	Signature of Faculty/ supervisor

OUTSTATION POSTING

S.No	Date		Your role	Signature of Faculty/ supervisor

PANEL DISCUSSIONS

S.No	Date	Topic discussed	Your role	Signature of Faculty/ supervisor

PAPER PUBLICATIONS/ PRESENTATIONS

S.No	Date	Details about your paper	Your role	Signature of Faculty/ supervisor

ENDORSEMENT BY
H.O.D

SLIDE SEMINAR

S.No	Date	Diagnosis of slides discussed	Faculty

		Signature of	

SUBJECT SEMINAR – PRESENTATIONS/PARTICIPATION

S.No	Date	Name of the topic	Presented/ Participated	Signature of Faculty

TILE / HRD WORKSHOPS ATTENDED

S.No	Date	Details of the workshop attended (Name, venue, speakers, topics etc.	Signature of HOD

UG – LIST OF THE THEORY CLASSES TAKEN

S.NO	Date	Name of chapter / system	Signature of HOD

UG LIST OF PRACTICAL CLASSES TAKEN

S.No	Date	System / Slide/ Gross specimens covered	Signature of HOD

OTHER ACTIVITIES

S.No	Date	Details	Your role	Signature of HOD

GROSSING AND RESECTION

Date	Sl.No	Path No.	Observed Written the description Grossing	Signature of Faculty

ENDORSEMENT BY H.O.D

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD PAEDIATRICS

Course Code 209

(2016-17 Academic year onwards)

2.COURSE CONTENT

2.1 Title of course:
M.D. Paediatrics

2.2 Objectives of course

- The goal of M D course in Pediatrics is to produce a competent pediatrician who:
  - recognizes the health needs of infants, children and adolescents and carries out professional obligations in keeping with principles of National Health Policy and professional ethics;
  - has acquired the competencies pertaining to pediatrics that are required to be practiced in the community and at all levels of health care system;
  - has acquired skills in effectively communicating with the child, family and the community;
  - is aware of the contemporary advances and developments in medical sciences as related to child health;
  - is oriented to principles of research methodology; and
  - has acquired skills in educating medical and paramedical professionals.

OBJECTIVES

- At the end of the MD course in Pediatrics, the student should be able to:
- recognize the key importance of child health in the context of the health priority of the country;
- practice the specialty of Pediatrics in keeping with the principles of professional ethics;
- identify social, economic, environmental, biological and emotional determinants of child and adolescent health, rehabilitative, preventive and promotive measures to provide holistic care to children;
- recognize the importance of growth and development as the foundation of Pediatrics; and help each child realize her/his optimal potential in this regard;
- take detailed history, perform full physical examination including neuro-development and behavioural assessment and anthropometric measurements of the child and make clinical diagnosis;
- perform relevant investigative and therapeutic procedures for the pediatric patient;
- interpret important imaging and laboratory results; (viii) diagnose illness in children based on the analysis of history, physical examination and investigative

work up; plan and deliver comprehensive treatment for illness in children using principles of rational drug therapy;

- plan and advise measures for the prevention of childhood disease and disability;
- plan rehabilitation of children suffering from chronic illness and handicap, and those with special needs;
- manage childhood emergencies efficiently;
- provide comprehensive care to normal, 'at risk' and sick neonates;
- recognize the emotional and behavioral characteristics of children, and keep these fundamental attributes in focus while dealing with them;
- demonstrate empathy and humane approach towards patients and their families and respect their sensibilities;
- demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities;
- develop skills as a self-directed learner, recognize continuing educational needs; use appropriate learning resources, and critically analyze relevant published literature in order to practice evidence based pediatrics;
- demonstrate competence in basic concepts of research methodology and epidemiology;
- facilitate learning of medical/nursing students, practicing physicians, para-medical health workers and other providers as a teacher-trainer;
- play the assigned role in the implementation of national health programs, effectively and responsibly;
- organize and supervise the desired managerial and leadership skills

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Present in clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years. The course should be successfully completed within double the duration of the stipulated period of the course.

2.6 Syllabus

As in 2.10
The concept of Health Care counselling shall be incorporated in all relevent areas.

2.7 Total number of hours

As mentioned in clause 2.10.

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.
All students should present atleast 2 papers in state/national conference of IAP.
All students should submit at least 1 paper in an indexed journal

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to within the first 6 months from the commencement of the course or as notified by the University.

Submission of dissertation

The dissertation shall be submitted to University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

EVALUATION OF RESIDENTS: -

Evaluation of residents for their knowledge and acquisition of attitudes, skills and competencies is a continuous process throughout their 3-year period of training. Evaluation of certain attributes such as interpersonal relationships, professional responsibility, sensitivity to patient's need for comfort, ethical behavior etc. is closely observed by the teaching faculty during the day-to-day clinical work of the resident. At the end of each clinical posting in each of

the medicine units and the subspecialties mentioned above, the residents are assessed in a formal format by the faculty staff of the concerned unit/department.

Formal Teaching Sessions
Case Discussion

Bedside discussion during ward rounds- cases should be presented by JRs briefly and then discussed with the faculty
There should be a detailed case presentation 3-4 per week. Cases may be allotted on the previous day itself and this should be known to all JRs, so that they can also see the case and come prepared.

Journal Club -Once in 2weeks

Clinical club (Interesting/difficult cases) once a month
Seminar/symposia Once every 2weeks –
Mortality meeting – monthly

Departmental meeting with Statistics PICU and NICU Once a month

2.10 Content of each subject in each year

Growth and development:

- Principles of growth and development
- Normal growth and development
- Sexual maturation and its disturbances
- Childhood and adolescence
- Failure to thrive and short stature

Neonatology

- Perinatal care
- Low birth weight
- Care in the labor room and resuscitation _
- Newborn feeding
- Prematurity
- Respiratory distress
- Common transient phenomena

- Infections
- Anemia and bleeding disorders
- Jaundice
- Neurologic disorders
- Renal disorders
- Understanding of perinatal medicine
- Thermoregulation and its disorder

Behavioral & Developmental disorders

- Rumination
- Pica
- Enuresis
- Encopresis
- Sleep disorders
- Habit disorders
- Breath holding spells
- Anxiety disorders
- Mood disorders - temper tantrums
- Attention deficit hyperactivity disorders
- Autism

Social pediatrics

- National health programs related to child health _ child abuse and neglect
- Child labor
- Adoption
- Disability and rehabilitation
- Rights of the child
- Disaster management
- National policy of child health and population
- Juvenile delinquency
- **Genetics**
- Principles of inheritance
- Pedigree drawing
- Chromosomal disorders
- Single gene disorders
- Multifactorial/polygenic disorders
- Genetic diagnosis
- Prenatal diagnosis

Nutrition

- Maternal nutritional disorder
- Nutrition for the low birth weight

- Breast feeding
- Infant feeding including vitamin and mineral deficiencies
- Complementary feeding
- Protein energy malnutrition including SAM
- Obesity
- Adolescent nutrition
- Parenternal and enteral nutrition
- Nutritional management of neonates and children
- In systemic illness like celiac disease, hepatobiliary disorders, nephrotic syndrome

Cardiovascular

- Congenital heart diseases - cyanotic and acyanotic
- Rheumatic fever and rheumatic heart disease
- Infective endocarditis
- Arrhythmias
- Disease of myocardium and pericardium
- Systemic hypertension
- Hyperlipidemia in children

Respiratory

- Congenital and acquired disorders of nose
- Infections of upper respiratory tract
- Obstructive sleep apnea
- Congenital anomalies of lower respiratory tract
- Foreign body in larynx, trachea & bronchus
- Trauma to larynx
- Neoplasm of larynx and trachea chronic
- Bronchitis
- Bronchiolitis
- Aspiration pneumonia
- GER
- Acute pneumonia
- Recurrent and interstitial pneumonia
- Suppurative lung diseases like bronchiectasia
- Atelectasis
- Lung cysts
- Emphysema and hyper-inflation
- Bronchial asthma
- Pulmonary edema
- Pleural effusion
- Pulmonary leaks

- Mediastinal mass

Gastrointestinal and liver disease

- Disease of mouth, oral cavity and tongue
- Disorders of deglutition and esophagus
- Peptic ulcer disease
- H. pylori infection
- Foreign body
- Congenital pyloric stenosis
- Intestinal obstruction
- Malabsorption syndrome
- Acute and chronic diarrhea
- Irritable bowel syndrome
- Inflammatory bowel diseases- ulcerative colitis and Crohn's disease
- Hirschsprung's disease
- Anorectal malformations
- Hepatitis
- Hepatic failure
- Chronic liver disease
- Wilson's disease
- Budd-Chiari syndrome
- Metabolic diseases of liver
- Cirrhosis and portal hypertension

Renal disorders

- Acute and chronic glomerulonephritis
- Nephrotic syndrome
- Hemolytic uremic syndrome
- Urinary tract infection
- VUR and renal scarring
- Renal tubular disorders diseases
- Congenital and hereditary renal disorders
- Renal and bladder stones
- Posterior urethral valves, hydronephrosis, voiding dysfunction
- Undescended testis
- Wilms tumor

Neurologic disorders

- Seizure and non-seizure paroxysmal events
- Epilepsy and epileptic syndromes
- Meningitis of childhood

- Brain abscess
- Coma
- Acute encephalitis and febrile encephalopathies ,ADEM
- Guillain-Barre syndrome
- Neurocysticercosis
- HIV encephalopathy
- SSPE
- Cerebral palsy
- Neurometabolic disorders
- Neurodegenerative disorders
- Neuromuscular disorders
- Mental retardation
- Learning disabilities
- Muscular dystrophies
- Acute flaccid paralysis and AFP surveillance
- Ataxias
- Movement disorders of childhood
- CNS tumors
- Malformations

Hematology & Oncology

- Deficiency anemias
- Hemolytic anemias
- Aplastic anemias
- Thrombocytopenia
- Hemostasis
- Blood component therapy
- Transfusion related infections
- Bone marrow transplant/stem cell transplant
- Acute and chronic leukemia
- Myelodysplastic syndrome
- Hodgkin disease
- Non-Hodgkin's lymphoma
- Neuroblastoma
- Hypercoagulable states

Endocrinology

- Hypopituitarism/hyperpituitarism
- Diabetes insipidus
- Pubertal disorders
- Hypo- and hyperthyroidism

- Adrenal insufficiency
- Cushing's syndrome
- Adrenogenital syndromes
- Diabetes mellitus
- Hypoglycemia
- Short stature
- Gonadal dysfunction and intersexuality
- Obesity

Infectious diseases

- Bacterial
- Viral
- Fungal
- Parasitic
- Rickettsial
- Mycoplasma
- Protozoal
- Tuberculosis
- Nosocomial
- HIV
- Emerging infectious diseases
- Control of epidemics and infection prevention
- Safe disposal of infective material

Emergency & Critical care

- Emergency care of shock & cardio-respiratory arrest
- Respiratory failure
- Acute renal failure
- Status epilepticus
- Acute severe asthma
- Fluid and electrolyte disturbances and its therapy
- Acid-base disturbances
- Poisoning
- Accidents
- Scorpion and snake bites
- Heat stroke and electrical injuries

Immunology & Rheumatology

- Arthritis (acute and chronic)
- Connective tissue disorders

- Immuno-deficiency syndromes
- Kawasaki disease

ENT

- Acute and chronic otitis media
- Conductive/sensorineural deafness
- Post-diphtheritic palatal palsy
- Acute/chronic tonsillitis/adenoids
- Allergic rhinitis/sinusitis
- Foreign body

Skin Diseases

- Exanthematous illnesses
- Vascular lesions
- Pigment disorders
- Vesicobullous disorders
- Infections: pyogenic, viral, fungal and parasitic
- Stevens-Johnson syndrome
- Eczema
- Seborrheic dermatitis
- Drug rash
- Urticaria
- Alopecia
- Ichthyosi

Eye diseases

- Refraction and accommodation
- Partial/total loss of vision cataract
- Night blindness
- Chorioretinitis
- Strabismus
- Conjunctival and corneal disorders
- Retinopathy of prematurity
- Retinoblastoma
- Optic atrophy
- Pailledema

Orthopedics

- Major congenital orthopedic deformities
- Bone and joint infections

- Common bone tumors

2.11 No: of hours per subject

Present in clause 2.10

2.12 Practical training

Rotations

General paediatrics

Postgraduate student must rotate through all clinical units of the department.

Neonatology (NICU) – 6 -9 months

Intensive Care (PICU) - 6 months

Subspeciality postings – Nephrology, oncology & Pediatric, cardiology and pediatric neurology-2 weeks each

OPD postings of the following specialities may be considered

Dermatology : 12 hrs (3 hrs/day for 4days)

Pediatric surgery : 24 hrs (3hrs/day for 8days)

Physical medicine: 12 hrs (3 hrs/day for 4 days)

2.13 Records

Present in clause 2.21

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed Proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re

evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Present in clause 2.12.

2.16 Project work to be done if any

As stipulated by the Head of Department.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Recommended books

- Behrman RE, Kliegman RM, Jenson HB. Nelson Textbook of Pediatrics. Harcourt Asia PvtLtd.
- Rudolph AM, Hoffman JIE, Rudolph CD. Rudolph's Pediatrics. Appleton and Lange.
- Campbell AGM, McIntosh N. Forfar and Arneil's Textbook of Pediatrics. ELBS.
- Ghai OP, Gupta P, Paul VK. Essential Pediatrics. Interprint, New Delhi.
- Singh M. Pediatrics Clinical Methods. Sagar PublicationsıSiberry GK, Iannone R.The Harriet Lane Handbook. Mosby & Harcourt India.
- Singh M, Deorari AK. Drug Doses in Children. Sagar Publications.
- Illingworth RS. The development of the infant and young child. Normal and abnormal. Churchill ,Livingstone,

Reference Books.

- Feigin RD, Cherry ID. Textbook of Pediatric Infectious Diseases. W. B. Saunders,
- Singh M. Medical emergencies in children. Sagar Publications, 3rd edition,
- Rogers MC, Nichols DG. Textbook of Pediatric intensive care. Williams & Wilkins, .
- Singh M. Care of the Newborn, Sagar Publication
- Avery GB, Fletcher MA, MacDonald MG. Neonatology- Pathophysiology and Management of the newborn. Lippincott William and Wilkins.
- Cloherty JP, Stark AR. Manual of Neonatal Care. Lippincott- Raven Publishers, 4t
- Nutrition- KE Elizabeth, Paras publishers.
- Park`s textbook of preventive and social pediatrics M/S Banarsidas Bhanot (publishers) Jabalpur 482001.India
- Swaiman B, Kenneth F, Ashwal S. Pediatric Neurology: Principles and Practice. St. Louis Mosby,

- Allen HO, Clark FB, Gutgesell HP, Driscoll DJ. Moss and Adam's Heart Disease in Infants,
- IAP textbook of pediatrics, currrent edition
- Developmental Pediatrics, M K C Nair, Noble publishers
- Children and Adolescents. Lippincott Williams and Wilkins,
- Park MK. Pediatric cardiology for practitioners. Mosby- YearBook, Inc.,
- Lifshitz F. Pediatric Endocrinology. Marcel Dekker, Inc.,
- Nathan DG, Orkin SH. Nathan and Oski's Hematology of Infancy and Childhood. W. B. Saunders
- Cassidy JT, Petty RE. Textbook of Pediatric Rheumatology. W. B. Saunders,
- Chernick V, Boat TF. Kendig's Disorders of the Respiratory Tract in Children. WB Saunders.
- Adolescent pediatrics, M K C Nair, Noble Publishers
- Adolelscent counciling , M K C Nair, Jaypee Publishers,2017
- S. Sushamabai Clinical Evaluation of Newborns Infants and children, Jaypee brothers Medical publishers (P) Ltd New Delhi 110002. India
- Illingworth's The Development of the infant and young child - normal and abnormal, M K C Nair and Paul Russel. Elsevier 10th edition 2012

2.20 Journals

- Indian J Pediatrics
- Indian Pediatrics
- Indian journal of practical pediatrics
- Journal of Pediatrics
- Pediatric Clinics of North America
- Archives of Diseases of Childhood

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3.EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.

- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

1. There shall be four theory papers.
2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that specialty.
3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- **Clinical / Practical and Oral**

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and three short cases or as the case may be in each speciality.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

2. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

Theory - 400 marks

<u>Theory examination</u>: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Paper I – Basic Science as Applied to Paediatrics

Paper II – Neonatology and Community Paediatrics

Paper III – General Paediatrics

Paper IV – Recent Advances in Paediatrics

3.6 Model question paper for each subject with question paper pattern

Paper I – Basic Science as Applied to Paediatrics

Time: 3 hrs Max marks:100

Answer all questions • Draw diagrams wherever necessary

Structured Essay: **(20)**

1. Ten year old boy,brought with sudden onset of right knee swelling and pain following a trivial fall.. On examination vitals stable, right knee swollen. Investigations showed normal blood counts and normal peripheral smear. Prothrombin time 14sec. Control 13sec. APTT 70 sec. Control 40sec. Discuss the clinical possibilities. Utilize the laboratory investigations to arrive at diagnosis.

Short essays: **(8x10=80)**

2. Vitamin D metabolism
3. Antenatal diagnosis of Down syndrome
4. Distal RTA
5. Hypo calcemia
6. Peak expiratory flow rate (PEFR)
7. Odd's ratio
8. Anion gap
9. Polio end game strategy

****

Paper II – Neonatology and Community Paediatrics

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Structured Essay **(20)**

1. A 3 day old baby is brought with seizures. Discuss the probable aetiological factors . How do you evaluate and manage

Short essays: **(8x10=80)**

2. Adoption
3. Developmental dysplasia of hip

4. Oto acoustic emission (OAE)

5. Essential new born care

6. Neonatal screening programs

7. Selective head cooling

8. Millennium development goals

9. ECMO (Extra corporeal membrane oxygenation)

****

Paper III – General Paediatrics

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Structured Essay: **(20)**

1. A 2 yrs old child is brought with history of fever of 4 days and tiredness since last one day. O/E extremities cold and child is restless. Discuss the approach and management.

Short essays: **(8x10=80)**

2. Feeding problems in a child with cerebral palsy

3. AVNRT (AV nodal re entrant tachycardia)

4. Autoimmune encephalitis

5. Hepatitis C

6. Myocarditis

7. Lab. diagnosis of leukemia

8. Torsion testes

9. Atopic dermatitis

****

Paper IV – Recent Advances in Paediatrics

Time: 3 hrs **Max marks:100**

- Answer all questions
- Draw diagrams wherever necessary

Essay **(20)**

1. Recent concepts in the management of birth asphyxia.

Short essays: **(8x10=80)**

2. Stem cell transplantation

. 3. Macrophage activation syndrome

4. Pain management in children

5.Enzyme replacement therapy

6.Recent advances in management of immune thrombocytopenic purpura

7. Childhood deafness prevention programme

8. Evaluation and management of first episode of UTI

9. Fluid management of of dengue

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practical exams .

- *Clinical / Practical and Oral*

Two external and two internal examiners should conduct the examinations

Practical examination pattern

<u>Clinical</u> (300 marks)

Long case	I	45 min	150marks

Short cases-3

Short case I (conventional system		20 min	75marks
Short case II		15 min	50marks
(Newborn)			
Short case III	OPD/ emergency	10min	25 marks

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

Viva: 20 x 4 Examiners = 80 marks on defined **areas** by each examiner separately

Logbook	**= 20 marks**
Total	**=100 marks**

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5.ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerned Institution.

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD PHARMACOLOGY

Course Code 210

(2016-17 Academic year onwards)

2016

2.COURSE CONTENT

2.1 Title of course:

M.D. Pharmacology

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to:

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

The purpose of post graduate curriculum is to standardize pharmacology teaching at Post graduate level throughout Kerala. Accordingly the training in MD Pharmacology should be distinctive from that in M.Pharm (Pharmacology) and M.Sc. Pharmacology.

Post graduate training in MD Pharmacology includes

- Theoretical knowledge
- Practical/clinical skills
- Preparation of thesis
- Developing competence in basic concepts of research methodology
- Clinical case discussions
- Clinical pharmacology training
- Pharmaceutical Industry Traininig

- Ethics in clinical research.
- Developing skills in educational methods as applicable to the teaching and
- Evaluation of MBBS and paramedical students.
- Computer knowledge

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As in 2.10

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

Present in clause 2.10

2.8 Branches if any with definition

Present in clause 2.10

2.9 Teaching learning methods

Learning Activity

Every student shall actively participate in all the clinical, academic & teaching activities in the department. Periodic appraisal of both theory & clinical skills are to be done every 6 months by the senior faculty for which at least 50% marks are needed for appearing the final examination. Also the candidate should have at least 80% attendance in the clinical & academic activities of each year for appearing the examination.

The following teaching activities are recommended:-

- Topic presentations
- Interactive Seminars
- Multidisciplinary symposiums
- Journal clubs
- Case presentations
- Clinical case discussions
- Morbidity & mortality meetings
- Critical Evaluation of complications
- Inter departmental discussions
- Teaching skill development by participating in undergraduate training program
- Research oriented training
- Dissertation Discussion

- CME programmes & conferences (at least one participation / presentation by the
- candidate)
- Active self-learning
- Lectures
- Group discussions

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each day's work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.
The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent within the first 6 months from the commencement of the course to the University as per notification.

Submission of dissertation

The dissertation shall be submitted to University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

SYLLABUS

Details of Theory

1. General pharmacology
2. Systemic pharmacology, antibiotics, chemotherapy and therapeutics.
3. Clinical pharmacology
4. Bioassay methods
5. Applied sciences
6. Biostatistics and their application in research
7. Recent advances in Pharmacology
8. Screening methods of drugs
9. Structure activity relationship of drugs.
10. Drug poisoning and their management
11. Special problems related to drug use in different age groups, pregnancy and
12. Preclinical Studies and alternatives to animal experiments

disease conditions

12. Research methodology

Contents of each paper

Paper I- General pharmacological principles and applied science

Drug receptors and pharmacodynamics, dosage forms, drug delivery systems, Pharmacokinetic principles & parameters; Factors modifying drug action, pharmacogenetic, pharmacogenomics, Orphan drugs & diseases; chronopharmacology, adverse Drug reactions; Drug interactions, drug dependence; synergism; Antagonism; fixed dose Combinations; Toxicology;Dose response relationships; drug development and regulation of drugs, therapeutic index, Etiopathogenesis of diseases relevant to therapeutic use of drugs; gene therapy & evidence based medicine; special aspects of perinatal, paediatric and geriatric pharmacology; rational prescribing; Translational medicine.

Paper II- Systemic Pharmacology, chemotherapy and therapeutics.

Pharmacology of drugs acting on autonomic, peripheral & CNS, cardiovascular, endocrine respiratory, renal, gastrointestinal and haemopoietic systems and treatment of diseases affecting these systems; Pharmacology of antimicrobial, antihelmintic, antiprotozoal, antifungal, antiviral and antimycobacterial drugs ; treatment of other infective diseases; cancer chemotherapy; Immunopharmacology, dermatological pharmacology, ocular pharmacology

Paper III- Experimental pharmacology, Bioassay and statistics

Common laboratory animals; anaesthetics used in labs; Physiological salt solutions; Care & handling of lab animals; bioassay of antagonist; breeding types and methods; methods of euthanasia; CPCSEA, IAEC composition & function; Restraining of animals & blood collection methods; euthanasia method used in experimental study; Bioassay Methods & bioassay of histamine, acetylcholine, oxytocin and catecholamine; Dose Response curve, cumulative dose response curve, animal models disease induced & transgenic animals; rabbit, mice, rat & of guinea pig as experimental animals; recombinant DNA technology; immunoassays; drug screening methods involved in the evaluation of antiulcer, antidepressant ,antianginal, antihypertensive,antidiabetic, antifertility, antipsychotic, hypnotic, anti-inflammatory, antipyretic, antiasthmatics, herbal drugs; Good Laboratory Practice; ethics In animal research; toxicity testing in animals; levers used.

Paper IV. - Clinical Pharmacology and recent advances.

Development of new drugs, protocol designing, phases of clinical trial, study design, and ethics of clinical trials; Clinical pharmacokinetics and pharmacodynamic studies, Post marketing surveillance. Therapeutic drug monitoring, pharmacogenomics, pharmacovigilance, Drug Information services, drug utilization studies, & therapeutic audit, essential drug Concept

and rational drug use; Good clinical practice; P- drug concept, HPLC, PCR, Chromatography; Recent advances in understanding of mechanism of drug action & treatment of diseases; New drugs & new uses of old drugs.

Details of practicals

I. Experimental pharmacology exercises (invitro)/interpretation/simulations

1) Bioassay of acetylcholne on rat colon using matching /bracketing assay. Calculations and plotting on log paper

2) Bioassay of oxytocin on rat uterus using matching /3point assay

3) Bioassay of serotonin on rat fundus using matching / 3 point assay. Calculations and plotting on log paper

4) Dose response curve of histamine on isolated guinea pig ileum

5) Bioassay of histamine on guinea pig ileum by matching method/ interpolation

6) Study of drug action on isolated rabbit heart (Langendorff's technique)

II. Experimental pharmacology exercises (invivo)

1. Study of local anaesthetics on rabbit cornea and by guinea pig intradermal wheal method

2. Study of analgesic activity of drugs using analgesiometer

3. Study of anti-inflammatory activity of drugs against carraginin induced rat paw oedema

4. Effect of psychopharmacological drugs on conditioned avoidance response (cook's pole Climbing)

5. Effect of psychopharmacological agents on elevated plus maze

6. Effects of drugs on spontaneous motor activity of mice – photoactometer

7. To demonstrate muscle relaxant property of diazepam in mouse using rotarod apparatus

8. Study of miotics and mydriatics on rabbits's eye.

9. Interpret graphs available on dog BP experiment

10. Interpret and practice virtual dog BP experiments

III. Clinical pharmacology exercises

1. Writing protocol for clinical trials and other biomedical research(presentation & discussion)

- Antihypertensives
- Antianginal
- Analgesic

- Anti-inflammatory
- Anticonvulsant
- Antipsychotic
- Antidepressant
- Hypnotic
- Antiparkinsonian drug
- Skeletal muscle relaxants
- Local anaesthetics
- Antihistamine
- Antitussive
- Antiulcerogenic drugs
- Diuretic
- Antiemetic
- Hypolipidemic drugs
- Anti-malarial drugs
- Antitubercular drugs
- Antifertility drugs
- Antiasthmatic
- Antiobesity
- Bioavailability studies
- Causality assessment in Clinical Pharmacology.
- spectrophotometry/ colorimetry/ HPLC depending on availability of facilities

2. Monitoring adverse drug reaction and detecting causality of adverse reactions.
3. Drug related problem solving exercises
4. Training at drug information centre, therapeutic drug monitoring and poison information centre
5. Comment on drug advertisement
6. Comment on a journal research article
7. Visit to CRO/pharmaceutical industry/clinical trial site
8. Learning Principles of PCR , HPLC , Immunoassay, spectrophotometer
9. Clinical pharmacokinetic parameter calculations- clearance, Vd, bioavailability ,AUC, half life
10. Ethics in clinical research
11. Pulmonary function test and ECG recording in volunteers
12. Drug utilization studies

13. Knowledge of Helsinki declaration, GCP guidelines, ICMR guidelines, Schedule Y, INSA guidelines

III. Chemical pharmacology exercises

1.Identification of Salicylates, Paracetmol, Atropine and steroids by chemical tests.
2.Estimation of drug levels using colorimetry and Spectrophotometry

V. Minor procedures

1. Injection of drugs through marginal ear vein of rabbits
2. Oral administration in mice or rats
3. Intraperitoneal and subcutaneous injections in mice and rats.
4. Techniques of handling animals

VI. Experimental methods discussion

Screening and evaluation of drug activities including animal models for the study of the following actions

- Analgesic
- Anti-inflammatory
- Local anaesthetics
- Drugs for peptic ulcer
- Anti convulsants
- Antianxiety
- Antipsychotics
- Antidepressants
- Hypnotic
- Antihypertensives
- Antianginal
- Antifertility
- Bronchodilator
- Antidiabetic
- Diuretic

To be conducted periodically throughout the course.

2.11 No: of hours per subject

As given under 2.10

2.12 Practical training

Clinical postings in various clinical and non-clinical departments to done in first year

- General medicine – 2 weeks
- Paediatrics-1 week
- Cardiology- 1 week
- Dermatology- 1 week
- Psychiatry -1 week
- Neurology- 1week
- Respiratory medicine- 1week
- Medical Gastroenterology- 1week
- Biochemistry- 1 week
- Microbiology – 2 days
- Toxicology lab- 2 days
- Clinical pharmacy- 2 days

2.13 Records

Not Applicable

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be reevaluated by the University. If thesis is rejected by 2 experts, the candidate will lose one chance of appearing for the examination and has to

resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Not Applicable

2.16 Project work to be done if any

Not Applicable

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

- Goodman & Gilman's The pharmacological Basis of Therapeutics. Hardman JG & Limbird LE (Ed), publisher: McGraw-Hill, New York.
- Basic & Clinical pharmacology. Katzung BG (Ed), publisher: Prentice hall. International Ltd, London.
- Avery's Drug Treatment. TM Speight & NHG Holford (Eds), Adis international.
- Principles of drug action. The Basis of Pharmacology. WB Pratt & P Taylor (Eds).Churchil Livingston, Edinburgh.
- Pharmacology & Pharmacotherapeutics, Satoskar RS, Bhandarkar SD(Ed), Publisher: Popular Prakashan Bombay.
- Essentials of Medical Pharmacology, Tripathi KD (Ed), Jaypee brothers, Publisher: Medical publishers (P) limited.
- Clinical pharmacology, Laurence DR, Bennet PN, Brown MJ(Ed). Publisher: Churchill Livingston.
- Critical appraisal of epidemiological studies and clinical trials- Mark Elwood. Oxford Press.
- Pharmacology .Rang HP, Dale M.Ritter JM 4th ed.Edinburgh, Churchill Livingstone. 1999
- Evaluation of Drug activities: Pharmacometrics. DR Laurence & A1. Bacharach (Eds), Academic press, London.
- Selected Topics in Experimental Pharmacology, UK. Sheth,NK Dadkar & U G Kamat. Kothari Book Depot, Mumbai.
- Fundamentals of Experimental Pharmacology. MN Ghosh (Ed), Scientific book Agency, Calcutta.

- Introductory Medical Statistics. Mould RF (Ed), Adam Hilger, Bristol and Philadelphia, 1989.

2.19 Reference books

- Goodman & Gilman's The pharmacological Basis of Therapeutics. Hardman JG & Limbird LE (Ed),publisher:McGraw-Hill, New York.
- Basic & Clinical pharmacology. Katzung BG (Ed), publisher: Prentice hall. International Ltd, London.
- Avery's Drug Treatment. TM Speight & NHG Holford (Eds), Adis international.
- Principles of drug action. The Basis of Pharmacology. WB Pratt & P Taylor (Eds).Churchil Livingston, Edinburgh.
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- Fundamentals of Experimental Pharmacology. MN Ghosh (Ed), Scientific book Agency, Calcutta.
- Introductory Medical Statistics. Mould RF (Ed), Adam Hilger, Bristol and Philadelphia, 1989.

2.20 Journals -

As recommended by the respective HODs

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

Main purpose of logbook should be to document the work done daily– all experiments and clinical pharmacology exercises, journal clubs, group discussion, seminar presentation, workshops and conference attendance, undergraduate teaching assignments and marks of final model examination. Log book to be signed monthly by HOD.

In adition to log book practical record should be maintained

3.EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year

3.2 Schedule of Regular/ Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 **Scheme of examination showing maximum marks and minimum marks**

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that specialty.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree

SCHEME OF EXAMINATION

- Theory 400 marks (4 Papers 4X100)
- Clinical / Practical 300 marks
- Oral 100 marks

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Practicals: Total 300 marks distributed between one long case (100 marks) & two short cases (100 marks), OSCE (50 marks) and ICU rounds (50 marks)

Oral: 100 marks for oral examination (80 marks for oral & 20 marks for Log book)

Pass Criteria: 50 % Separate minimum for:

(1) Theory with 40% minimum for each paper
(2) Clinical / practical, and oral examinations (Separate pass for Clinical / practical, and oral)

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Theory examination: Consists of four papers of three hour duration. Each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

- Paper I- General pharmacological principles and applied sciences.
- Paper II- Systemic pharmacology, Chemotherapy & therapeutics
- Paper III- Experimental pharmacology, Bioassay & statistics
- Paper IV- Clinical pharmacology & recent advances.

3.6 Model question paper for each subject with question paper pattern

Kerala University of Health Sciences

MD PHARMACOLOGY DEGREE EXAMINATION

Max: 100 marks Time: 3 Hours

PAPER I

GENERAL PHARMACOLOGICAL PRINCIPLES AND APPLIED SCIENCES

I. Describe the bio transformation of drugs. Discuss the factors affecting it. Discuss the clinical relevance. (20 marks)

II. Write briefly on (10 x 8 = 80)

1. Fixed dose combination of drugs
2. Structure activity relationship of corticosteroids
3. Second messengers
4. Drug therapy during pregnancy
5. Plasma protein binding
6. G protein coupled receptors
7. Plasma half life
8. Orders of kinetics and their clinical importance

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Kerala University of Health Sciences

MD PHARMACOLOGY DEGREE EXAMINATION

Max:100 marks Time: 3 Hours

PAPER II

SYSTEMIC PHARMACOLOGY, CHEMOTHERAPY AND THERAPEUTICS

I. a) Discuss the current status of pharmacotherapy of tuberculosis
b) Discuss short course chemotherapy (20 Marks)

II. Write short notes on (10 x 8 = 80)

1. Treatment of migraine
2. Hormone replacement therapy
3. Fluroquinolones
4. Treatment of osteoporosis
5. Drug therapy of glaucoma - Newer concepts
6. Insulin analogues
7. Monoclonal antibodies
8. Amiodarone

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Kerala University of Health Sciences

MD PHARMACOLOGY DEGREE EXAMINATION

Max:100 marks Time: 3 Hours

PAPER III - EXPERIMENTAL PHARMACOLOGY, BIOASSAY AND STATISTICS

I. Describe methods used to evaluate anti-inflammatory drugs (20 Marks)

II. Write short notes on (10 x 8 = 80)

1) Students 't' test
2) Design of acute toxicity tests
3) Log dose response curve
4) Rat as an experimental animal in Pharmacology
5) Detection and estimation of acetylcholine

6) Volume of distribution of drugs
7) HPLC
8) Physiological salt solutions

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Kerala University of Health Sciences

MD PHARMACOLOGY DEGREE EXAMINATION

Max: 100 marks Time: 3 Hours

PAPER IV

CLINICAL PHARMACOLOGY AND RECENT ADVANCES

I. Design a phase II clinical trial for the study of an antihypertensive activity of a new drug molecule (20 Marks)

II. Write briefly on (10 x 8 = 80)

1. Pharmacovigilance
2. Cytokines as potential therapeutic targets
3. Drugs for treating obesity
4. Atypical antidepressants
5. Treatment of Alzheimer's disease
6. Treatment of venous thrombosis
7. Therapeutic drug monitoring
8. Melatonin

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3.7 Internal assessment component

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Not applicable.

3.8 Details of practical/clinical practicum exams

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each specialty. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Practicals should be spread over 2 days. The practical examination should consist of the following.

1. One experimental pharmacology exercise on intact animal.
2. One experimental pharmacology exercise on isolated organ.
3. One minor procedure exercise
4. One chemical pharmacology exercise.
5. One clinical pharmacology exercise from the list given below
   a) Drug related problem solving exercise
   b) Writing a protocol for a clinical trial.
   c) Comment on a paper reporting a clinical trial.
   d) Comment on a drug advertisement
   e) Statistical evaluation of a given data

All practical exercises are to be evaluated jointly by all the examiners.

KERALA UNIVERSITY OF HEALTH SCIENCES

MD Pharmacology Practical examination - Assessment scheme

Sl. No	Practical Exercises Marks							TOTAL (300)	%	VIVA (100)	Remarks
	A Interpretation of Experimental Pharmac. Chart/ Simulation (25)	B Minor procedure (50)	C Whole animal Experiment (50)	D Drug related problem solving exercises (50)	E Protocol writing (50)	F Chemical Pharmacology (25)	G Pedagogy (50)				

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

- Viva 80 marks
- Log Book – 20 marks
- Total – 100 marks

An oral question- Answer session should be conducted at the end of each practical exercise.

1. Pedagogy- 10 minutes
2. General viva voce and viva on dissertation and research methodology and Pharmacotherapeutics

4.INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. **ANNEXURES**

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerned Institution

REGULATIONS 2017

Syllabus

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE

IN MEDICINE

MD PHYSICAL MEDICINE AND REHABILITATION

Course Code 211

(2017-18 Academic year onwards)

2017

2. COURSE CONTENT

2.1 Title of course:

M.D. Physical Medicine and Rehabilitation

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practised at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

GENERAL OBJECTIVES

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practise the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative and preventive measure/strategies.

- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.

- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.

- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.

- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.

- Play the assigned role in the implementation of National health programmes, effectively and responsibly.

- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.

- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.

- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.

- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.

- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Present in clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

Present in clause 2.10

The concept of healthcare counselling shall be incorporated in the relevant areas.

2.7 Total number of hours

Present in clause 2.10

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

  - The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model

prescribed by the University. This log book will be assessed by the postgraduate Guide of the student and will be jointly evaluated by the Guide & Head of the Department.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of log book .

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the Ethical committee and PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the University in the calendar of events..

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

The following syllabus for MD in Physical Medicine & Rehabilitation has been conceived, organized and integrated in order to guide the sincere student towards a comprehensive understanding of the science which he has chosen as his subject of study, envisaging a future which is bound to require holistic, complete, wholesome and quality health care for every individual inhabiting the globe, which the philosophy of Rehabilitation Medicine is most equipped to supply. After the successful completion of this period of study, it is hoped that the student of Rehabilitation Medicine becomes not only an ideal physician to the disabled but also a more complete and compassionate individual and an asset to the world community.

1. **Basic Sciences as applied to Physical Medicine & Rehabilitation**

1. **Anatomy** (40 hours of lectures and demonstrations)

a. Musculo-skeletal system – Osteology and Myology, Functional Anatomy, Kinesiology and Anthropology
b. Neuroanatomy - Brain, Spinal Cord, Peripheral Nerves, Autonomic Nervous System.
c. Cardiovascular system
d. Respiratory system
e. Histology of bones, cartilage, muscles, nerves and skin

2. **Physiology** (30 hours of lectures and demonstrations)

a. Muscle – Ultra structure and chemical composition, contraction, fatigue, changes in denervated muscle
b. Nerve – properties of peripheral nerve, membrane potential and depolarization, nerve impulse, nerve conduction, neuromuscular transmission, motor unit, muscle spindle, electro- diagnosis
c. Central nervous system – sensations and volition, co-ordination of movement and regulation of posture, special senses, language and speech
d. Autonomic nervous system
e. Cardiovascular system
f. Respiratory system – including assessment of pulmonary function
g. Endocrine system – including pituitary, thyroid, adrenal and endocrine pancreas.
h. Renal functions, control of micturition
i. Temperature regulation
j. Physiology of exercise
k. Bone remodeling

3. **Biochemistry** (10 hours of lectures and demonstrations)

a. General metabolism and nutrition
b. Acid base balance
c. Calcium and Phosphorus metabolism,Vitamin D, PTH, Calcitonin

4. **Biophysics as applied to Physical Medicine** (30 hours of lectures and demonstrations)

a. Biomechanics of human movement
b. Properties of physical agents used in Physical Medicine – heat, cold, light, electromagnetic spectrum, electricity, ultrasound and LASER

5. **Basic Pathology and Microbiology** (35 hours of lectures and demonstrations)

a. Degenerations, circulatory disturbances, inflammation and repair
b. Infections of bones and joints, Inflammatory disorders like Rheumatoid arthritis and allied conditions (in detail) including immunology
c. Neuropathology- trauma to central nervous system, degenerations of CNS, infections, cerebrovascular accidents, tumours, peripheral nerve injuries
d. Cardiovascular diseases with emphasis on congenital heart diseases, valvular heart diseases, hypertension, peripheral vascular disorders and coronary heart disease
e. Respiratory diseases with emphasis on infections, restrictive and obstructive disorders
f. Diseases of the kidney and urinary tract
g. Major endocrine disorders like Hypothyroidism and Obesity
h. Nutritional deficiencies
i. Diseases of muscles
j. Genetic disorders
k. Pathology of aging
l. Metabolic disorders like diabetes mellitus, dyslipidemia and metabolic syndrome

6. **Pharmacology** (20 hours of lectures and demonstrations)

a. Drugs acting on the adrenergic system
b. Drugs acting on the peripheral nervous system (somatic) including skeletal muscle relaxants
c. Local anaesthetics
d. Autocoids and related drugs
e. Drugs for COPD and Asthma
f. Oxygen Therapy
g. Hormones
h. Drugs affecting calcium balance
i. Sedatives, hypnotics
j. Anticonvulsants
k. Antispasticity agents
l. Anxiolytics
m. Nonopiod Analgesics and Nonsteroidal Antiinflammatory Drugs
n. Opioids
o. Hypolipidaemic agents and Plasma Expanders
p. Steroids
q. Antihypertensive agents
r. Drugs acting in neurogenic bladder dysfunction
s. Drugs acting on the bowel

t. Anti rheumatic agents and Biologicals
u. Antibiotics
v. Antidepressants
w. Immunosuppressants
x. Anti-cancer agents
y. Drugs in diabetes
z. Vaccines and immunoglobulins

2. **Clinical Physical Medicine & Rehabilitation** (175 hours)

1. History and scope of the specialty, definitions and terminology
2. Diagnostic application of physical agents including Musculoskeletal Ultrasound
3. Treatment modalities used in Physical Medicine- general properties and detailed clinical use of each

   a. Heat – general physiological properties and mode of action as a treatment agent, indications and contraindications, forms of heat therapy – superficial and deep heating including treatment techniques. Emphasis will be given to Infrared, Hydro collator, Paraffin Wax bath, convection heating devices, shortwave diathermy, microwave diathermy and ultrasonic therapy
   b. Cold as a therapeutic agent
   c. Ultraviolet radiation – physiological properties of U.V.R., mode of application in clinical use with indications, contraindications and side effects
   d. Therapeutic electricity – Low voltage currents, low and high frequency currents
   e. Hydrotherapy
   f. Prescription of physical modalities and their applications in medical, surgical and gynaecological disorders
   g. LASER

4. Clinical use of massage, manipulation, stretching and traction
5. General principles of therapeutic exercises (for muscle strength, endurance, power, motor re-education, co-ordination and joint mobility), maintenance of physical fitness through optimum exercise
6. Prescription of exercise therapy and other supportive measures
7. Analysis of gait – kinetics and kinematics, normal and pathological gaits, gait analysis and gait lab
8. Energy costs of functional activities in health and disease, experimental and clinical use of ergometry in Physical Medicine
9. Principles of occupational therapy, training in activities of daily living for rehabilitation, self-help devices, instrumental activities of daily living, environmental control units, setting up an occupational therapy section, evaluation of occupational and functional performance, access to home, community and work place, assistive technology in disability
10. Rehabilitation aids including walking aids, wheelchairs, tricycles, modified vehicles

11. Electro diagnosis - electromyography and application of electrophysiological testing of muscles and nerves for diagnostic and prognostic purposes including SSEP and Repetitive stimulation
12. Outcome assessment tools, use of questionnaires, disability evaluation, certification
13. Sports Medicinea.

a. Physical fitness training for sports personnel
b. Rehabilitation of the injured athlete
c. Sports for the disabled
d. Nutrition in sports
e. Use and abuse of drugs in sports
f. Rational and safe use of medications in sports
g. Fluid and electrolyte changes in exercise
h. Safety, management and prevention of sporting trauma, principles of safety equipment
i. Knowledge of contact and non-contact sports
j. Sudden death in sports
k. Chronic and overuse injuries
l. Medical and psychological problems of athletes
m. The growing athlete
n. The female athlete
o. Performance below par
p. Ethics of sports medicine and rehabilitation
q. Managing medical issues at stadiums
r. Non-competitive and competitive sports
s. Altitude training and training in climatic extremes
t. Exercise management for persons with chronic disease and disability- ACSM

14. Rehabilitation management of cases with various clinical conditions and disabilities

a. Neuromuscular disability – with particular emphasis on strokes, post-polio paralysis, cerebral palsy, spinal cord injuries, muscular dystrophies, spinal muscular atrophy, disorders of the neuromuscular junction, swallowing disorders, extrapyramidal syndromes, peripheral nerve injuries and neuropathies, myopathies, neural tube defects, critical illness neuropathy
b. Orthopaedic disability- arthritis and joint deformities, postural problems and amputations
c. Cardiovascular disability
d. Pulmonary disability
e. Bladder and bowel dysfunction
f. Cancer
g. Vestibular dysfunction
h. Obesity
i. Diabetes and Dyslipidaemia
j. Autism spectrum disorders, learning disabilities, mental retardation
k. Visual impairment and disability

l. Auditory impairment and disability
m. Psychological impairment, mental and cognitive disability
n. HIV/AIDS

15. Prosthetics and Orthotics
a. General definitions – evolution of the field with emphasis on the Indian scene
b. Indications for amputations – classical amputations- influence of prosthetic technology on amputation techniques – ideal stump – stump complications and their management
c. Recent advances in amputation surgery and prosthetic science – myoelectric control for prostheses, computer aided design and manufacture
d. Clinical examination of the amputees, and prescription of prosthesis
e. Types of lower extremity prostheses – biomechanical considerations – knee and foot mechanics, alignment and fit, check-out
f. Immediate post-operative fitting of prostheses
g. Type of upper extremity prostheses - functional considerations, cosmetic considerations
h. Bracing – Indications and preliminary considerations on pre-orthotic preparation and post-orthotic training
i. Types of common braces and corrective shoes – prescription criteria and checkout procedures in fitting – lower extremity, upper extremity and spinal orthoses
j. Common materials used in prosthetics and orthotic manufacture
k. Equipment necessary for prosthetic and orthotic fabrication, organization of prosthetic & orthotic workshop
i. Minimum requirements for setting up of an Artificial Limb fitting Centre

16. Psychosocial and psychiatric problems in rehabilitation and their management
17. Epidemiology of disability
18. Principles of rehabilitation nursing
19. Principles of management of communication impairments
20. Special principles in the rehabilitation management of children's problems
21. Management of the geriatric patient and rehabilitation
22. Rehabilitation management of the injured "industry" worker
23. Orientation on the socio–economic and vocational aspects of rehabilitation

    a. Principles of vocational guidance, training and placement
    b. Social integration of the disabled
    c. Elimination of architectural barriers for the differently-abled in relation to housing, transportation and employment (barrier-free environment)
    d. Mobilizing community resources for rehabilitation
    e. Role of voluntary agencies

24. Principles of the "Team approach" towards rehabilitation, members of the team and the role of each.

25. Organization and administration of Rehabilitation facilities in
    a. Teaching hospitals
    b. Large general hospitals
    c. Specialized treatment centers
    d. Rural rehabilitation services
26. Issues of sexuality in Rehabilitation, rehabilitation of sexual problems
27. Community Based Rehabilitation
28. Pain Management

a. Anatomy and Physiology of Pain pathways
b. Pharmacotherapy of pain
c. Intra-articular injection techniques
d. Complex Regional Pain Syndromes
e. Phantom pain
f. Facial Pain
g. Fibromyalgia and myofascial pain syndromes
h. Interventions for pain including trigger point injections, nerve blocks, caudal epidural block
i. Management of cancer pain- overview
j. Pharmacotherapy of cancer pain
k. Interventions for cancer pain
l. Evaluation and interventional management of spinal pain
m. Pain after spinal cord injury- evaluation and management
p. Chronic pain

29. Rehabilitation of the patient with cancer related disability
30. Management of colostomy, tracheostomy, laryngectomy and mastectomy
31. Epidemiology of Disability
32. Medical emergencies in rehabilitation
33. Computers in rehabilitation
34. Research methodology in rehabilitation medicine
35. Multiple disabilities
36. Sociology and health, social epidemiology, health seeking behaviour, social planning and development, socialization, environment and health, social groups, family, community, social psychology, QOL, groups and leadership, social problems in contemporary society, medical and social work as relevant to Rehabilitation Medicine
37. Integrated Medicine in PMR with general knowledge of common complementary and alternative medicine systems, categories of alternate medical systems including chiropractic, osteopathic medicine, meditation, art therapy, music therapy, dance therapy and movement therapies like Tai Chi, yoga, energy therapy, acupuncture, acupressure, reflexology. common biological supplements

3. Allied Disciplines:

A. **Medicine including Neurology and Rheumatology** (80 hours)

a. General metabolic and endocrine disorders including diabetes and dyslipidaemia
b. Common infectious diseases prevalent in India
c. Disorders of nutrition
d. Degenerative diseases and special problems in the elderly
e. Common cardiovascular diseases
f. Common respiratory diseases
g. Rheumatoid and allied diseases including classification, etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis and management
h. Genetics
i. Neurological disorders

1. Congenital disorders of the nervous system
2. Hereditary – familial, degenerative, demyelinating, neoplastic disorders
3. Progressive disorders
4. Language disorders
5. Epilepsy
6. Stroke
7. Spinal Cord Injury- Paraplegia and quadriplegia
8. Autonomic disturbances
9. Disorders of peripheral nerves
10. Assessment of intelligence – Mental retardation
11. Traumatic Brain Injury
12. Extrapyramidal disorders
13. Multiple sclerosis
14. Infectious and toxic encephalitis
15. Tumours

j. Disorders of frontal lobe function, dementias- primary and secondary
k. Apraxia, Agnosia and Aphasia
l. Human Immunodeficiency Virus and AIDS

B. **Surgery including Orthopaedic Surgery** (60 hours)

a. Shock and its management
b. Management of burns
c. Wound infections and their management
d. Pressure sores - aetiology, management and prevention
e. Principles of emergency resuscitation

f. Common orthopaedic injuries and principles of management, plaster techniques, complications of fractures, post-surgical patient, joint replacements, spinal stabilization
g. Orthopaedic problems in children and their management
h. Diseases of bones and joints (congenital, infective, inflammatory, metabolic, degenerative and neoplastic)
i. Orthopaedic problems resulting from neuromuscular diseases – pathogenesis, clinical picture, diagnosis and principles of management including surgical techniques
j. Scoliosis and other spinal deformities
k. Amputation surgery
l. Hand rehabilitation
m. Hip and knee contractures, foot disorders

C. Community Medicine (20 hours)

a. Identification of community needs for health services, including rehabilitation services, utilization of the epidemiological approach and statistical methodology
b. Principles of comprehensive health care, integrating rehabilitation practices with general health services (candidates are expected to acquire clinical practice through rural and urban health units)
c. Preventive rehabilitation approach in medical care at the grass root and intermediate community levels
d. Immunization practices
e. Health education practices
f. Biostatistics with reference to sampling and sample size, randomization and tests of significance

D. Pediatrics (20 hours)

a. Normal growth and development.

1. Prenatal
2. Neonatal to adolescence (gross motor, fine motor, reflex maturation, cognitive, social and personality)

a) Developmental delay and mental subnormality
b) Behavioural disorders and their relationship to organic diseases
c) Planning education programs for disabled children
d) Common congenital and hereditary disorders of children
e) Common childhood diseases (including poliomyelitis, cerebral palsy, meningitis, rheumatic fever and neoplasms)
f) Childhood disability
g) Autism and Attention Deficit Hyperactivity Disorder

E. Psychiatry and Clinical Psychology (20 hours)

a. Mental status, intelligence and personality assessment
b. Behavioural disturbances due to organic brain damage
c. Overt psychopathologic reactions – neurotic, psychotic or sociopathic states
(Latter including addiction, alcoholism and sexual disturbances)
d. Emotional disturbances – anxiety, depression, aggressiveness, apathy
e. Psychological responses to illness and disability
f. Introduction to counseling, counseling in individuals and organizations, assessing various types of counseling provisions, conflicts between values of organization and counseling, the roles and responsibilities of counselors, common methods of counseling and their applications in relation to Rehabilitation Medicine

F. Cardiology (10 hours)

a. Common disorders of the cardiovascular system with particular emphasis on the congenital, rheumatic, hypertensive and ischemic diseases
b. Assessment and classification of functional status of the heart and work capacity
–Application of data for rehabilitation – recent advances
c. Rehabilitation of patients with cardiac illnesses – post-myocardial infarction,
CABG, cardiac transplantation, cardiomyopathy and valvular heart disease, protocols in exercise testing (Bruce, Naughton and others)

G. Chest diseases (10 hours)

a. Allergic, infective, neoplastic, obstructive and restrictive disorders of the respiratory system
b. Respiratory assistance therapy, oxygen therapy, chest physiotherapy

H. Radiology and Cancer (15 hours)

a. Interpretation of radiological findings on common diseases
b. Common diagnostic radiological procedures
c. Contrast studies and their significance
d. Principles of nuclear medicine
e. Principles of radiotherapy
f. Principles of anti-cancer chemotherapy
g. Palliative care

I. Neurosurgery (10 hours)

a. Management of trauma to the central nervous system
b. Congenital, infective, degenerative and neoplastic diseases of the brain or spinal cord including aetiology, pathogenesis, diagnosis and management
c. Peripheral nerve injuries

J. Plastic Surgery (7 hours)

a. Methods and techniques of skin grafting
b. Principles of reconstructive surgery for correction of deformities
c. Surgical treatment of decubitus ulcers
d. Principles of hand surgery, tendon transfers in upper and lower limbs

K. Urology (6 hours)

a. Evaluation and management of the neurogenic bladder dysfunction
b. Upper and lower urinary tract infections – aetiology, diagnosis and treatment

L. E.N.T (10 hours)

Common E.N.T disorders, including speech and hearing impairments and their management

M. Obstetrics and Gynecology (6 hours)

a. Pelvic infections
b. Urogenital prolapse
c. Role of exercise therapy in Obstetrics and Gynaecology practice
d. Women's issues in rehabilitation

N. Ophthalmology (10 hours)

Common ophthalmological disorders, causes of blindness, prevention and management, and disability evaluation.

O. Law in relation to disability including PWD Act, 1995, amendments and RCI Act 1992, The National Trust Act, 1999, Schemes and Benefits for persons with disabilities, disability evaluation (10 hours)

P. Recent advances including Evidence Based Medicine in PMR(20 hours)

2.11 No: of hours per subject

Present in clause 2.10 of the curriculum.

2.12 Practical training

30 months should be spent in Physical Medicine and Rehabilitation.
6 months may be spent in allied disciplines like Neuromedicine, Orthopaedics, Sports Medicine, Cardiology, Pulmonology, ICU, Dermatology, Diabetology, Rheumatology.

2.13 Records

Students has to maintain a log book, practical record and Thesis book.

2.14 Dissertation: As per Dissertation regulation of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Speciality training may be conducted in Neuromedicine, Orthopaedics, Sports Medicine, Cardiology, Pulmonology, ICU, Dermatology, Diabetology, Rheumatology.

2.16 Project work to be done if any

Not Applicable

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

- Physical Medicine and Rehabilitation- Braddom R L
- Textbook of Rehabilitation Medicine- Delisa
- Text book of Rehabilitation Medicine by Rusk H A

- Krusen's Hand Book of Physical Medicine and Rehabilitation
- Muscles testing and function with posture and pain, Florence Peterson Kendall, Elizabeth Kendall McCreary
- Hutchison's Clinical Methods- Swash M
- Clinical Sports Medicine, Peter Brukner & Karim Khan

- Sports Injury Assessment and Rehabilitation- Reid, David.C
- Therapeutic Exercises - Basmajian
- Kelly's Text book of Rheumatology- Ruddy, Harris and Sledge
- Medical Ethics –Schwartz
- Spinal Cord Medicine –Denise J C, Delisa J
- Physiological Basis of Rehabilitation Medicine- (Downey and Darling), Erwin G Gonzalez
- The Physiology of the Joints, Vol. I, II, III- Kapandji.I.A
- Exercise and the Heart- Froelicher and Myers
- The Internet and Health Communication- Rice and Katz
- Amputations and Prosthesis- May
- Radiology and Imaging for Medical Students- Sutton
- Geriatric Medicine- Schrier
- Computers in Medicine- Javitt
- Practice Manual of PMR- Tan
- EMG Secrets- Tan
- Ultrasound Scanning, Principles, Protocol- Tempkin
- How to write health science papers, thesiss- Thomas et al
- Principles of Hospital Administration- Sakharker
- Ergonomics at Work- Osborne
- Management in Rehabilitation- Schuch and Sekarak
- Clinical Biomechanics- Valmassy
- Psychology- Westen
- Clinical Neuophysiology- Mishra U K, Kalita J
- Handbook for Research Methods in Health Sciences- Sullivan M
- A Manual on Clinical Surgery - Somen Das.
- Pain Management in Rehabilitation- Monga & Grabois
- Disability Evaluation- Demeter, Anderson & Smith
- Introducing Palliative Care- Robert Twycross
- Exercise management for persons with chronic disease and disability- ACSM
- Solomon L. Apley's System of Orthopaedics and Fractures. Arnold London (latest edition)

- Vernon W Lin. Spinal Cord Medicine- Principles and Practice. Demos
- Introduction to Psychology, Clifford T. Morgan, Richard A. King, Tata McGraw Hill Edition
- Behavioral Medicine- A guide for clinical Practice , Mitchell D.Feldman, John F. Christensen
- Clinical evaluation and diagnostic tests for Neuromuscular disorders, Tulio E. Bertorini
- Electrodiagnosis in diseases of nerve and muscle: Principles and practice, Jun Kimura

- Essentials of Exercise Physiology, William D. Mc Ardle
- Fundamentals of Pain Medicine, J.D. Hoppenfeld
- Kinesiology: The mechanics and pathomechanics of human movement, Carol A. Oatis
- Movement disorders: A Clinical and therapeutic approach, Shyamal K Das
- Rheumatology Principles and practice, Ashit Syngle, SD Deodhar
- Hutchison's Paediatrics, Krishna M Goel, Devendra K Gupta
- Treatment of Cerebral Palsy and Motor Delay, Sophie Levitt
- Atlas of Musculoskeletal Ultrasound, PK Srivastava
- Atlas of nerve conduction studies and electromyography, A. Arturo Leis, Michael P. Schenk
- Neurological rehabilitation, Richard Greenwood, Michael P.Barnes
- Occupational therapy for physical dysfunction, Catherine A. Trombly
- Clayton's Electrotherapy, Shiela Kitchen
- ISCOS, The textbook on comprehensive management of Spinal Cord Injuries, Dr H S Chhabra
- Joint structure and function: A Comprehensive analysis, Cynthia C. Norkin
- Tidy's Physiotherapy, Stuart Porter
- Brain's diseases of nervous system, Michael Donaghy
- Dejong's : The neurological examination, William W. Campbell
- Disabled Village Children, David Werner
- Nothing about us without us: Developing innovative technologies For, By, and with disabled persons, David Werner
- Helander E, Mendis P, Nelson G, Goerdt A, Training in the Community for People with Disabilities WHO, Geneva, 1989.
- Atlas of Orthoses and Assistive Devices, John D. Hsu
- Atlas of Amputations and Limb deficiencies, Douglas G. Smith

2.19 Reference books

- Harrison's Principles of Internal Medicine- Fauci A.S, Braunwald E
- Nelson Textbook of Paediatrics- Nelson W.E, Behrman R.E
- Turek's Orthopaedics: Principles and Applications- Weinstein S L, Buckwalter J
- Basic and Clinical Pharmacology - Katzung B.G
- Treatment and rehabilitation of fractures-Hoppenfeld & Murthy

2.20 Journals

- Archives of Rehabilitation Medicine
- Scandinavian Journal of Rehabilitation Medicine
- Spinal Cord
- Indian Journal of Orthopaedics
- Stroke
- Arthritis and Rheumatism
- Indian Pediatrics

- Neurology India
- Indian Journal of Disability and Rehabilitation
- Sports Training, Medicine & Rehabilitation
- Journal of Rehabilitation Research and Development
- National Medical Journal of India
- American Journal of Physical Medicine and Rehabilitation
- PM & R journal
- Disability and Rehabilitation
- Clinical Rehabilitation
- Neuro Rehabilitation
- Physical Medicine & Rehabilitation Clinics of North America
- Orthopaedics Clinics of North America
- Journal of Prosthetics Orthotics International
- Physical Therapy
- American Journal of Occupational Therapy
- Indian Journal of Orthopaedics (IJO)
- Indian Journal of Physical Medicine & Rehabilitation (IJPMR)

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATION

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.

- Should have presented at least one paper/poster in International/National/State conferences.

  Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

  The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- ***Clinical / Practical and Oral***

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and three short cases.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

<u>Theory examination</u>:

Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

- Paper I – Basic Sciences as Applied to Physical Medicine & Rehabilitation
- Paper II –Physical Medicine & Rehabilitation Including Physical Modalities and Biomedical Instrumentation
- Paper III –Physical Medicine & Rehabilitation Including Prosthetics and Orthotics
- Paper IV – Physical Medicine and Rehabilitation including Sports Medicine and Recent Advances

3.6Model question paper for each subject with question paper pattern

QP Code: Reg.No:

MD Degree Examinations in Physical Medicine & Rehabilitation

(Model Question Paper)

Paper I – Basic Sciences as Applied to Physical Medicine & Rehabilitation

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Essay: (20)

1. Draw a labelled diagram of Brachial Plexus and describe the segmental significance of various types of brachial plexus injuries

Short essays: (10x8=80)

2. Blood supply of the spinal cord
3. Intrinsic muscles of the hand
4. Bronchopulmonary segments
5. Disturbances in muscle tone
6. Plasticity of the brain
7. Role of methotrexate in the treatment of Rheumatoid Arthritis
8. Electromagnetic spectrum
9. Role of baclofen in the treatment of spasticity

QP Code: **Reg.No:**

MD Degree Examinations in Physical Medicine & Rehabilitation

(Model Question Paper)

Paper II – Physical Medicine and Rehabilitation including Physical Modalities and Biomedical Instrumentation

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Essay: (20)

1. Discuss the evaluation and management of a 55 year old diabetic male with a trophic ulcer on the sole of the right foot of 6 months' duration.

Short essays: (10x8=50)

2. Interferential Therapy
3. Evaluation of a cerebral palsy child
4. Limb girdle type of muscular dystrophy
5. Reflex bladder
6. Laser therapy
7. Therapeutic uses of cold
8. Magnetron
9. Single Fibre EMG

QP Code: **Reg.No:**

MD Degree Examinations in Physical Medicine & Rehabilitation

(Model Question Paper)

Paper III – Physical Medicine & Rehabilitation Including Prosthetics and Orthotics

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Essay: (20)

1. Discuss the principles of geriatric rehabilitation.

Short essays: (10x8=50)

2. Management of Dysphagia
3. Disability in the Parkinsonian syndrome
4. Management of ischial pressure sores
5. Mini mental status examination
6. Intra-articular injections
7. Assessment of motor development
8. Value of bone scans in PM&R
9. Energey storing feet

QP Code: **Reg.No:**

MD Degree Examinations in Physical Medicine & Rehabilitation

(Model Question Paper)

Paper IV – Physical Medicine and Rehabilitation including Sports Medicine and Recent Advances

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Essay: (20)

1. Describe the components of a functional prosthesis for a transhumeral amputee. List the recent advances in each of these components.

Short essays: (10x8=50)

2. The WHO analgesic ladder
3. Use of botulinum toxin in cerebral diplegia
4. Long term oxygen therapy
5. Surgical management of obesity
6. Rehabilitation after cardiac transplant
7. The female athlete
8. Selective serotonin receptor inhibitors
9. Regeneration after spinal cord injury

3.7 Internal assessment component

As per existing KUHS rules.

3.8 Details of practical/clinical practicum exams

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- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine a minimum of one long case and three short cases.
2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.
3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.9 Details of viva: division of marks

Viva Voce: 80 marks
Log Book: 20 marks
Total: 100 marks

4.INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerned institution.

FORMAT OF LOG BOOK

DEPARTMENT OF MEDICAL EDUCATION

MEDICAL COLLEGE ……..

DEPARTMENT OF ……

LOG BOOK OF

THE DEGREE OF …….

NAME……

1. BIODATA OF THE CANDIDATE

2. EXPERIENCE BEFORE JOINING P.G. COURSE

3. DETAILS OF POSTING :

- FIRST YEAR
- SECOND YEAR
- THIRD YEAR

4. THESIS RESEARCH WORK
5. PARTICIPATION CONFERENCES – CME PROGRAMMES

6. DETAILS OF LEAVE AVAILED

7. DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

8. SEMINARS /SYMPOSIA PRESENTED

9. STATISTICAL MEETINGS / DEPARTMENTAL MORTALITY MEETINGS

10. JOURNAL CLUBS

11. TEACHING ASSIGNMENTS – UNDERGRADUATES / NURSES/PARAMEDICAL.

12. SPECIAL DUTIES (IF ANY)

13. INTERNAL ASSESSMENT

14. MISCELLANEOUS

15. Daily activities record (BLANK PAGES)

One page for each month

16. SUMMARY

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD PSYCHIATRY

Course Code 212

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Psychiatry

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.

- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.

- Who shall be aware of the contemporary advance and developments in the discipline concerned.

- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.

- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.

- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As given under clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As per clause 2.10
The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

As mentioned in clause 2.10

2.8 Branches if any with definition

Not applicable

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

  - The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

  - Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco –

economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
2. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to within the first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

Theory
General Guidelines

During the training period efforts should made to spend adequate time for discussing mental health problems of public health importance in the country.

The Patient – Doctor Relationship

- Human Development throughout the Lifecycle Normality, Embryo, Foetus, Infant, and Child, Adolescence, Adulthood, Late Adulthood (Old Age), Death, Dying and Bereavement.

- The Brain and Behaviour, Functional and Behavioral Neuroanatomy, Neurophysiology and Neurochemistry, Neuroimaging, Electrophysiology, Psychoneuroendocrinology, Psychoneuroimmunology and Chronobiology, Neurogenetics.

- Contributions of the Psychosocial Sciences, Jean Piaget, Attachment Theory, Learning Theory, Aggression, Sociology and Ethology, Anthropology and Cross-CulturalPsychiatry, Epidemiology and Biostatistics.

- Clinical Neuropsychological Testing, Clinical Neuropsychological Testing of Intelligence in Adults & children Personality assessment in adults & children

- Theories of Personality and Psychopathology, Sigmund Freud: Founder of Classic Psychoanalysis, Erik Erikson, Schools derived from Psychoanalysis and Psychology.

- Clinical Examination of the Psychiatric patient, Psychiatric History and Mental Status Examination, Interviewing Techniques with Special Patient Populations, Physical Examination of the Psychiatric Patient, Laboratory tests in Psychiatry. Medical Record and Medical Error.

- Signs and Symptoms in Psychiatry

- Classification in Psychiatry, Psychiatric Classification, International Psychiatric Diagnosis

- Delirium, Dementia, and Amnestic and Other Cognitive Disorders and Mental Disorders due to a General Medical Condition ,Cognitive Disorders Introduction and Overview, Delirium, Dementia, Amnestic Disorders ,Other Cognitive Disorders and Mental Disorders due to a General Medical Condition

- Substance-Related Disorders

Substance-Related Disorders Introduction and Overview, Alcohol-Related Disorders, Amphetamine (or Amphetamine-like) related Disorders, Caffeine-Related Disorders, Cannabis-Related Disorders, Cocaine-Related Disorders,Hallucinogen-Related Disorders, Inhalant- Related Disorders, Nicotine-Related Disorders, Opioid-Related Disorders, Phencyclidine (or Phencyclidine-like) related Disorders, Sedative-, Hypnotic-, or Anxiolytic-Related Disorders, Anabolic-Androgenic steroid abuse

- Schizophrenia and Other Psychotic Disorders

Concept of Schizophrenia, Scope of the Problem, Genetics, Environmental Epidemiology, Developmental Model of Schizophrenia, Neuroimaging in Schizophrenia, Linking Neuropsychiatric Manifestations to Neurobiology Neuropathology, Clinical Features and Psychopathology Concepts Cognition, Sensory Gating Deficits and Translational Research Psychosocial Treatment Somatic Treatment Psychiatric Rehabilitation Integrative Treatment and Functional Outcomes, Spectrum Pathology and Treatment, Other Psychotic Disorders, Acute and Transient Psychotic Disorders and Brief Psychotic Disorder, Schizophreniform Disorder, Delusional Disorder and Shared Psychotic Disorder, Schizoaffective Disorder, Postpartum Psychosis, Culture-Bound Syndromes with Psychotic Features, Psychosis Not Otherwise Specified, Treatment of Other Psychotic Disorders, Schizophrenia and Other Psychotic Disorders Special Issues in Early Detection and Intervention

- Mood Disorders

Historical Introduction and Conceptual Overview, Epidemiology, Genetics, Neurobiology, Intrapsychic and Interpersonal Aspects, Clinical Features treatment of Depression, Treatment of Bipolar Disorders, Psychotherapy

- Anxiety Disorders

Introduction and Overview, Epidemiology, Psychophysiological Aspects, Neurochemical Aspects, Neuroimaging, Psychodynamic Aspects, Clinical Features, Somatic Treatment, Cognitive-Behavioral Therapy

- Somatoform Disorders
- Factitious Disorders
- Dissociative Disorders
- Normal Human Sexuality and Sexual and Gender Identity Disorders
  Homosexual Behaviour, Paraphilias, Gender Identity Disorders, Sexual Addiction
- Eating Disorders
- Sleep Disorders
- Impulse-Control Disorders Not Elsewhere Classified
- Adjustment Disorders
- Personality Disorders
- Psychological Factors Affecting Medical Conditions

History of Psychosomatic Medicine, Gastrointestinal Disorders, Obesity, Cardiovascular Disorders, Respiratory Disorders, Endocrine and Metabolic Disorders, Psychocutaneous Disorders, Musculoskeletal Disorders, Stress and Psychiatry, Psycho-Oncology, Consultation-Liaison Psychiatry

- Relational Problems
- Additional conditions that may be a focus of clinical attention:

Malingering, Adult Antisocial Behaviour, Criminality, and Violence, Borderline Intellectual Functioning and Academic Problem, Other additional conditions that may be a focus of clinical attention

- Culture-Bound Syndromes

- Special Areas of Interest

  Psychiatry and Reproductive Medicine, Premenstrual Dysphoric Disorder, Genetic Counselling, End-of-Life and Palliative Care, Death, Dying, and Bereavement, Physical and Sexual Abuse of Adults, Survivors of Torture, Alternative and Complementary Health Practices, Military and Disaster Psychiatry, Famous Named Cases in Psychiatry

- Psychiatric Emergencies

Suicide, Other Psychiatric Emergencies

- Psychotherapies

Psychoanalysis and Psychoanalytic Psychotherapy, Behaviour Therapy, Hypnosis, Group Psychotherapy and Combined Individual and Group Psychotherapy, Family Therapy and Couple Therapy, Cognitive Therapy, Interpersonal Psychotherapy, Dialectical Behavior Therapy, Intensive Short-Term Dynamic Psychotherapy, Other Methods of Psychotherapy, Evaluation of Psychotherapy.

- Biological Therapies

General Principles of Psychopharmacology, Pharmacokinetics and Drug Interactions, Drug Development and Approval Process , Medication-Induced Movement Disorders, _-Alfa-Adrenergic receptor Agonists Conidine and Guanfacine, -Adrenergic Receptor Antagonists, Anticholinergics and Amantadine, Anticonvulsants, Antihistamines, Barbiturates and similarly acting substances, Benzodiazepine Receptor Agonists and Antagonists, Bupropion, Buspirone, Calcium Channel Inhibitors, Cholinesterase Inhibitors and Similarly Acting Compounds, Dopamine Receptor Antagonists (Typical Antipsychotics), Lithium, Mirtazapine, Monoamine Oxidise Inhibitors, Nefazodone, Opiate Receptor Agonists Methadone, Levomethadyl, and Buprenorphine, Opioid Receptor Antagonists Naltrexone and Nalmefene, Selective Serotonin Norepinephrine Reuptake Inhibitors, Selective Serotonin Reuptake Inhibitors, Serotonin-Dopamine, Antagonists (Atypical or Second-Generation Antipsychotics), Sympathomimetics and Dopamine Receptor Agonists, Thyroid Hormones, Trazodone, Tricyclics and Tetracyclics, Electroconvulsive Therapy, Neurosurgical Treatments and Deep Brain Stimulation, Other Pharmacological and Biological Therapies, Drug Augmentation, Reproductive Hormonal Therapy Theory and Practice

- Child Psychiatry

Introduction and Overview, Normal Child Development, Normal Adolescence
Psychiatric Examination of the Infant, Child, and Adolescent

- Mental Retardation

- Learning Disorders

Reading Disorder, Mathematics Disorder, Disorder of Written Expression and Learning Disorder Not Otherwise Specified

- Motor Skills Disorder Developmental Coordination Disorder

- Communication Disorders

Expressive Language Disorder, Mixed Receptive-Expressive Disorder, Phonological Disorder, Stuttering, Communication Disorder Not Otherwise Specified

- Pervasive Developmental Disorders

- Attention-Deficit Disorders

Attention-Deficit/Hyperactivity Disorder, Adult Manifestations of Attention-Deficit/Hyperactivity Disorder

- Disruptive Behavior Disorders

- Feeding and Eating Disorders of Infancy and Early Childhood

- Tic Disorders

- Elimination Disorders

- Other Disorders of Infancy, Childhood, and Adolescence Reactive Attachment

Disorder of Infancy and Early Childhood, Stereotypic Movement Disorder of Infancy, Disorders of Infancy andEarly Childhood Not Otherwise Specified

- Mood Disorders in Children and Adolescents

Depressive Disorders and Suicide in Children and Adolescents, Early- Onset Bipolar Disorders

- Anxiety Disorders in Children

Obsessive-Compulsive Disorder in Children, Posttraumatic Stress Disorder in Childrenand Adolescents, Separation Anxiety Disorder and Other Anxiety Disorders, Selective Mutism

- Early-Onset Schizophrenia

- Psychiatric Treatment of children

Individual Psychodynamic Psychotherapy, Short-Term Psychotherapies for the Treatment of Child and Adolescent Disorders, Cognitive Behavioral Psychotherapy for Children and Adolescents, Group Psychotherapy, Family Therapy, Pediatric Psychopharmacology, Partial Hospital and Ambulatory Behavioral Health Services, Residential And Inpatient Treatment, Community- Based Treatment, Psychiatric Treatment of Adolescents

- Adulthood

- Geriatric Psychiatry

Overview, Assessment, Psychiatric Disorders of Late Life, Treatment of Psychiatric Disorders in Late Life, Delirium in Elderly ,Dementia, Depression in Late Life, Health Care Delivery Systems, Special Areas of Interest

- Hospital and Community Psychiatry

Public Mental Health , Community Psychiatry, National Mental Health Program, District Mental Health Program, Health Care Reforms, Role of the Psychiatric Hospital in the treatment of Mental Illness, Psychiatric Rehabilitation, Research Methodology and Statistics.

- Psychiatric Education

Graduate Psychiatric Education, Examining Psychiatrists and Other Professionals, an Anthropological View of Psychiatry

- Ethics and Forensic Psychiatry

Clinical-Legal Issues in Psychiatry, Ethics in Psychiatry, Correctional Psychiatry

- Psychiatry Past and Future

History of Psychiatry, World Aspects of Psychiatry, Future of Psychiatry

Practical

Diagnostic Work up

Detailed history, MSE & administration of rating scales to diagnose to patient along with management plan.

_ Modified ECT
_ Psychological Testing
_ I.Q Test
_ Memory Test
_ Personality Test
_ Neuropsychological tests
_ Psychological Treatment
_ Psychotherapy
_ Behaviour Therapy

☆

_ Cognitive behaviour therapy
_ Neurological Examination
_ Detailed neurological assessment
_ Findings of CT, MRI
_ E.E.G.

Skills

History and examination

History taking including present history, past, family, personal, psychosocial history, physical and mental status examination and application of the relevant psychiatry rating scales. Psychohdiagnostic & psychodynamic formulations

Bedside investigations

Hemoglobin, TLC, ESR, peripheral smear staining and examination, urine: routine and microscopic examination, Viral markers, urine for screening for substances of abuse.

- *Interpretation of* ECG, EEG, MRI findings; CT scan.
- *Understanding of* common EEG patterns

2.11 No: of hours per subject

As given under 2.10.

2.12 Practical training

Postings

The postgraduate student rotates through emergency, O.P.D. and Ward Postings & consultation Liaison Psychiatry. In addition, following special rotations are also undertaken:

Neurology: 2 months

Internal Medicine : 1month
Child & adolescent Psychiatry: 2months
Community & legal Psychiatry: 2months
Deaddiction: 2months
Psychology: 2 months

During first year the resident will work under direct supervision of the 2/3 year Resident/senior resident and consultant on call. S/he will be responsible for taking detailed history, examination of patients as per the file record and send appropriate investigations as advised by seniors. Initially all procedures are to be observed and then done under supervision of seniors and during 2/3 year can do procedures independently. In 2nd year, resident should be posted in special clinics also. In 3 rd year, resident is also encourged to make independent decisions in management of cases. S/he is also involved in teaching of undergraduate students.

Job Responsibilities

OPD: History and work up of all cases and presentation to the consultants

Indoors: Sending investigations and filling investigation forms and performing procedures as Narco- analysis, Aversion therapy and E.C.T.

Ward: History and work up of all cases

- Examination of all patients and documentation the files.
- Daily Mental Status Examination of the patients
- Applying relevant psychiatry rating scales
- Completion of files
- Preparation of discharge summary

2.13 Records .

Relevant records are to be maintained as per clause 2.21.

2.14 Dissertation: As per Dissertation regulation of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

As mentioned in clause 2.10.

2.16 Project work to be done if any:

Trainees should be encouraged to participate in on going service or research projects.They may also take up new projects under supervision**.**

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Core Books

_ Comprehensive Text book of Psychiatry by Kaplan & Sadock
_ New Oxford Text Book of psychiatry- Gelder & Andreasen
_ Psychopharmacology by Stephen M. Stahl
_ Fish's clinical psychology/ Symptoms in mind- Andrew Sim
_ Psychology by Morgan and King.
_ Social Psychology by David G. Myers

2.19 Reference books

_ Organic Psychiatry by Leishman
_ Technique of Psychotherapy by Wolberg
_ General Psychopathology- Jasper

2.20 Journals

_ Indian Journal of Psychiatry
-Indian Journal of Psychological Medicine
_ British Journal of Psychiatry
_ American Journal of Psychiatry
_ JAMA Psychiatry
_ Journal of Clinical Psychiatry
_ Psychiatry Clinics of North America

Internet resources

_ ermed gateway
_ ovid
_ Science direct
Website of W.H.O : *www.who.int/mental_health/*
Cochrane Library : www.cochranelibrary.com/

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Submission of Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.
2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.
3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

- **Theory - 400 marks(4 papers of 100 mark each)**
- **Clinical / Practical - 300 marks**
- **Viva - 100 marks**

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

Theory Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Paper I – Basic Sciences Applied to Psychiatry, Clinical Psychology & Sociology

Paper II – General Medicine Including Neurology

Paper III –General Psychiatry

Paper IV – Psychiatry Subspecialties and Recent Advances

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No.:……**

MD Degree Examinations in Psychiatry
(Model Question Paper)
Paper I – Basic Sciences Applied to Psychiatry, Clinical Psychology & Sociology

Time: 3 hrs **Max marks:100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(20)**

1. Write an essay on Serotonin and its role in neuro-psychiatric disorders.

Short Essays: (8x10=80)

2. Synaptic Plasticity

3. Meta analysis

4. Intra neuronal signalling

5. Parietal Lobe

6. Genetic Counselling

7. Nucleus Accumbens

8. Self actualization

9. Psychiatric Epidemiology

QP Code: **Reg.No.:……**

MD Degree Examinations in Psychiatry

(Model Question Paper)

Paper II – General Medicine Including Neurology

Time: 3 hrs **Max marks:100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essay: **(20)**

1. Define Epilepsy. Describe the neuro-psychiatric manifestations of Epilepsy

Short Essays: **(8x10=80)**

2. Apraxias
3. Normal Pressure Hydrocephalus
4. Psychosomatic Medicine
5. Functional Neuroimaging
6. Neuropsychiatric aspects of AIDS
7. Headache-Types and management
8. Steroid related disorders
9. Stroke (CVA) in the young

****

QP Code: **Reg.No.:……**

MD Degree Examinations in Psychiatry

(Model Question Paper)

Paper IV – Psychiatry Subspecialties and Recent Advances

Time: 3 hrs **Max marks:100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: **(20)**

1. Discuss the diagnosis and management of Conduct Disorder in children.

Short Essays: **(8x10=80)**

2. Therapeutic community
3. Cognitive remediation
4. Mental Health Care Act
5. Recent Advances in Psychiatric Classification
6. Culture bound syndromes
7. Positive Psychology
8. Forward Genetics
9. Palliative Psychiatry

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

<u>Practicals</u>:

- Four cases for each candidate.
- One Long Case (Psychiatry) .Time total 60 minutes (45 minutes for work up and 15 minutes for writing). Marks 150

- Three Short Cases. Total marks 150 (60+60+30)
    1. Neurology Short Case: 30 minutes and 60 marks
    2. Psychiatry Short Case: 30 minutes and 60 marks
    3. Psychiatry Short Case (Specific Task: Examination of intelligence, cognitive functions, thought/ perception, involuntary movement or any specific assessment of psychopathology).Time 15 minutes and 30 marks .

- **Total for Practical = 300 marks**

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor and Head of the Department or Head of the Department.

3.10 Details of viva: division of marks

The Oral Viva examination shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty. Viva will be for 100 marks. Out of this 80 marks are allocated for the viva per se and 20 marks for the evaluation of the log book of the candidate.

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

REGULATIONS 2016

Syllabus

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD RADIODIAGNOSIS

Course Code 213

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Radiodiagnosis

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and Medical teachers.

- Who shall recognise the health needs of the community, carry out professional obligations ethically in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advances and developments in the discipline, acquired a spirit of scientific inquisitiveness and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching the medical and paramedical professionals.

At the end of the Post Graduate training the student shall be able to;

- Recognise the health needs of the community in the speciality and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and consider them while planning therapeutic, rehabilitative and preventive measures/strategies.
- Diagnose and manage majority of the conditions based on clinical assessment and appropriate investigations.
- Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the social norms and expectations.
- Play the assigned role in the implementation of National health programmes effectively and responsibly.
- Organise and supervise the chosen/assigned health care services with adequate managerial skills in the clinic/hospital.

- Develop skills as a self-directed learner, continue medical education by selecting and using appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

Objectives

- The students shall be able to identify and correctly interpret the radiological findings in the various systems like Respiratory, Cardiovascular, Central and peripheral Nervous, Gastrointestinal, Genito-urinary, Musculoskeletal System etc. and in Soft tissues.
- The students shall learn about various imaging techniques like Plain Radiography, Digital Radiography (including Computed Radiography), Conventional Contrast Radiography, Tomography, Computed Tomography, Ultrasonography, Colour Doppler, Digital Vascular Imaging, MRI, Mammography and other modalities.
- The students should have basic knowledge in various interventional radiological procedures and be able to do invasive procedures in Radiology.
- A working knowledge of the role of isotopes in medical diagnosis is also desirable.
- They should have acquired knowledge in design, organisation, and management of the Department of Radiodiagnosis.
- They should have the basic knowledge in Medical Audit, Health Economics and Health Information Systems.
- They should understand the basic physics of X-ray production, its interaction with living tissues, its use and hazards.
- They should know about radiation protection and understand the ways of protecting the humanity from possible harmful effect of radiation from various radiological procedures.
- They shall be fully conscious of the cost effectiveness of various Radiological investigations.

At the end of the course, the student shall have the following abilities.

a) To use the theoretical knowledge and carry out the various radiological investigations like Barium studies , contrast studies of Hepatobiliary System, Genito-urinary System, Vascular System, Lymphatic System etc.
b) To carry out investigations such as ERCP, Angiography etc. (if necessary, with the help of physician and surgeon).
c) To carry out various invasive and interventional procedures including Radio Frequency Ablation (RFA).

d) To choose the most appropriate investigation or suggest the correct diagnostic approach in a given situation.
e) To interpret the images in correlation with the clinical situation.
f) To perform Cardiac Ultrasonography (Echocardiography).
g) To take utmost care regarding radiation protection and safety for the Radiation worker and the Public.

2.3 Medium of instruction:

English.

2.4 Course outline

After successful completion of the MD (Radiodiagnosis), the candidates should acquire sufficient knowledge and expertise to qualify them as a consultant in the field of Diagnostic Radiology and Imaging. They should acquire the knowledge in the basic radiographic techniques, radiological investigations, invasive procedures and sufficient knowledge in Ultrasonography (including colour Doppler), CT scan, MR imaging, Vascular Imaging, and Digital Radiography (including Computed Radiography). A working knowledge of the role of isotopes in medical diagnosis and basic knowledge in various interventional radiological procedures etc. are expected. They should also acquire knowledge in design, organisation and management of the Department of Radiodiagnosis. In addition, they should have the basic understanding of medical audit, health economics, Health Information Systems and Radiation protection.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognised Post Graduate teacher for a period of three years.

2.6 Syllabus

As given in 2.10
The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

As mentioned in clause 2.11

2.8 Branches if any with definition

Radio diagnosis, Radiation Physics, and Nuclear Medicine

2.9 Teaching learning methods

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, and given full responsibility, assignments and participation in all facets of the educational process.
- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and monitor the implementation of these training Programmes.
- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.
- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently, similar to the model prescribed by the University.
- The record books shall be checked and assessed monthly by the faculty members imparting the training.
- During the post graduate training in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.
- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students, interns and paramedical students.
- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done (Log book).

1. A log book showing each day's work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.

2. This practical record of the work (log book) has to be maintained by the candidate and duly scrutinised and certified by the head of the department and to be submitted to the examiners during final examination.

3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained in the log book.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review, the teaching performance and progress in dissertation work.

The assessment will be done by all the recognised P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study, every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognised postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.
2. Data collection for dissertation and writing the dissertation.
3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.
4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinised by the PG training cum Research Committee of the concerned institution. The synopsis should be sent to the Registrar, within first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the Registrar (Evaluation) of the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

2.10 Content of each subject in each year

SYLLABUS

RESEARCH METHODOLOGY

Lectures, by the faculty members.

Seminars, by students, supervised by the faculty members.

A. **General**

- Introduction, Evidence based medicine.
- Types of Research- Basic research (Fundamental research) - Applied research.
- Types of Epidemiological studies, Study Designs.
- Details of Observational studies: Case report, case series, surveys, Case control studies, cohort studies, ecological studies.
- Details of Experimental studies: Clinical trials, Field trials, Community trials.
- Meta- analysis and systematic reviews.
- Sources of Data and Data Collection methods.
- Morbidity and Mortality, Measurement of burden of illness – Incidence, Prevalence, Cumulative incidence, Rates, Human development index.
- Association- Correlation-Risk factor- Causation.
- Errors: Systematic and Random- Confounding, interaction.
- Evaluation of diagnostic tests- agreement studies.
- Prevention-Diagnosis – Decision making – Decision analysis.
- Prognosis-Treatment – Clinical trials – Efficacy – Effectiveness.
- Qualitative research: introduction, methods.
- Concept of Validity, reliability, generalisability and inference.
- Critical appraisal – selecting and reading Medical literature.
- Abstracting and Research Paper writing.

B. **Biostatistics.**

- Data entry, Data cleaning, Data analysis.
- Population, sample, parameter, statistics, variables.
- Central tendency and its measures – Measures of Dispersion-variability – Grouped data – percentiles, quartiles, ranks.
- Probability – Factorial notation – Baye's theorem.
- Populations, samples – Sampling methods-Random and Non Random samples – Random Number Table, Sample size calculations.
- Distributions – Binomial, poisson, normal distributions – fitting distribution to data – central limit theorem.
- Point estimation – interval estimation – confidence intervals – Difference between means and proportions.
- Descriptive and inferential statistics.

- Tests for normality of underlying distributions.
- Hypothesis testing – power – relation with sample size – Type I and Type II error – Testing in normal, binomial and "t' distributions, p-value.
- Chi square-Regression and correlations-Analysis of variance (ANOVA)-Analysis of co variance (ANCOVA).
- Statistics in Confounding and effect modification- methods for assessment of effect modification.
- Univariate, Bivariate and Multivariate analysis, Model building, prediction.
- Basics of Logistic regression, survival analysis, and non-parametric tests.

C. **Ethics in Medical Research**.

- Introduction and history of ethics in medicine.
- Individual and societal rights- principles of ethics, Confidentiality, Informed consent.
- Ethical principles/guidelines for doing clinical research, field studies, social science research, genetic research, animal experiments.
- ICMR, GCP, ICH guidelines, Clinical Trial regulations in India.
- Functioning of Institutional Review board (IRB).
- Research mis-conduct and means to prevent it.

BASIC SCIENCES:

Lectures, by the faculty members.

Models and specimen demonstration, by the faculty members.

Seminars, by students, supervised by the faculty members.

Practicals, to be trained under the supervision of the faculty members.

Physiology .

- CSF – production and circulation
- Blood flow dynamics in various organs as applied in Doppler Study.
- Relevant Gastro Intestinal, Hepatobiliary and Renal Physiology.
- Physiology of endocrine systems and also of Puberty.
- Relevant Physiology of other systems applicable to Radiological Imaging, including fracture healing.
- Physiology related to Gestation.
- Foetal circulation
- Physiology relevant with Paediatric patients.
- Physiology of normal and abnormal growth.
- Physiology of Contrast Agents in Radiology

Pathology .

- Basic general Pathology.

- Basics of the Pathology of tumours, infection, inflammation, vascular diseases etc. as applied to Radiological Imaging of various organs and systems.
- Basics of the Pathology of Congenital malformations.

Pharmacology .

- Pharmacology of intravenous contrast media – dose, uses, adverse reactions and management of adverse reactions.
- Ionic and non-ionic contrast media - advantages and disadvantages.
- CT, MR and Ultrasonography contrast agents.
- Pharmacology and properties of Isotope pharmaceutical agents, tracers, dose, applications.
- Essential drugs in the management of adverse contrast reaction, dose application and route of administration.

Radiological Anatomy and Applied Embryology .

- The candidate should be familiar with Radiological Anatomy and applied embryology of Gastro Intestinal Tract, Genito Urinary Tract, Central Nervous System, Eye, Para Nasal Sinuses, Cardio Vascular System, Skeletal System, Respiratory system, Soft Tissues and Endocrine organs.

They should have the knowledge of the basic anatomy relevant to all common radiological investigations and cross sectional anatomy in the axial, coronal and sagittal planes and in oblique planes.

RADIATION PHYSICS

Lectures, by the faculty members.

Models and specimen demonstration, by the faculty members.

Seminars, by students, supervised by the faculty members.

Practicals, to be trained under the supervision of the faculty members.

Basic physics of radioactivity, production of X-Ray, interaction of X-Ray with matter, effects of X-Ray, measurements of X-Ray quantity, principles and methods of radiation protection in Diagnostic Radiology.

Physics of Diagnostic Radiology

- Structure of X-Ray tube and electrical circuit of x ray unit.
- Various types of X-Ray tubes, tube assembly and Tube rating.
- Production, effects, and measurement of X-Rays.
- Interaction of X-Rays with matter.
- Image Intensification.
- Conventional Fluoroscopy and IITV Systems.
- Physics of DSA.

- Xeroradiography
- X –Ray Radiography, Photofluorography. Angiography.
- Physics of Radiographic Cassettes, Films and Intensifying Screens
- Conventional and Computed Tomography.
- Mammography (including Digital Mammography).
- Image quality and factors controlling the same in conventional and modern techniques.
- Dark room techniques including Dark room Design.
- Factors influencing the radiographic image and assurance of quality control in radiography.
- Various artefacts in Radiology and Imaging.
- Effects and control of scattered radiation.
- Physics of Collimators, Filters, and Grid.
- Radioactivity-Basic principles.
- Radioactive decay, production of radioisotope imaging, uptake studies, clinical applications.
- Gamma camera, Radionuclide scanning
- Radiological aspects and nuclear medicine.
- Physics of Bone Densitometry
- Image processing (Conventional-Manual and automatic)
- Image processing (Digital)
- Digital Radiography and Computed Radiography.
- Physics of Ultrasonography.
- MRI, MR Spectroscopy.
- Physics of PET and SPECT.
- Picture Archival and Communication System(PACS)

Radiation protection

- Radiations hazards in Diagnostic Radiology.
- Essential of radiobiology and biological effects of Radiation.
- Personal monitoring, Dosimeters**,** permissible dose, ICRP recommendation.
- Departmental protection - National and Intentional regulations.
- Radiation Protection for Radiology workers and for the general public.
- Planning and layout of Diagnostic Radiology Department.
- Basics of X– ray equipment installation, AERB regulations, radiation acceptance test.
- Radiation units and measurements.
- Exposure – dose, dose equivalent.
- Dosimetry instruments: Ionisation Chamber Systems, GM counters, Scintillation Detectors, TLD, and Photographic Dosimetry.
- QA & control systems.

RADIOGRAPHY AND

DARK ROOM PROCEDURES

Lectures, by the faculty members.

Models and specimen demonstration, by the faculty members.

Seminars, by students, supervised by the faculty members.

Practicals, to be trained under the supervision of the faculty members.

- Conventional Radiography including views of extremities, Spine, Skull, PNS, Abdomen, Thorax and Pelvis.
- Special Radiographic Techniques like Stress Views ,Trauma Radiography, Axial and Oblique views
- Contrast techniques of Gastro Intestinal System, Respiratory, Hepatobiliary System, Urogenital System, Central Nervous System, Cardio Vascular System, Soft tissues, musculoskeletal and Salivary glands.
- Contrast techniques in other Systems.
- Conventional Tomography.
- OPG and Dental Radiography
- Magnification techniques, Portable Radiography.
- MMR/Photofluorography.
- Chemistry of processing & dark room procedures.
- Dark room design

RADIODIAGNOSIS

Lectures, by the faculty members.

Models and specimen demonstration, by the faculty members.

Seminars, by students, supervised by the faculty members.

Practicals, to be trained under the supervision of the faculty members.

RESPIRATORY SYSTEM AND CHEST.

- Normal Chest, methods of examination
- Digital Radiography in Chest.
- High KV techniques.
- Mediastinal and pleural disease.
- Inflammatory and interstitial disease of the Lung.
- Pneumothorax, Pneumomediastinum, Cystic disease of Lung
- Infections of Lung, Mediastinum, Pleura and Chest wall.
- Tumours of Lung, Pleura and Chest wall.

- Pulmonary thrombo-embolism.
- Trauma and Postoperative chest.
- Paediatric chest including congenital conditions
- Radiology of Respiratory distress (New born, Child and Adult)
- Miscellaneous Lung conditions including pneumoconiosis, emphysema, chronic bronchitis, foreign bodies, Post Radiation, Post Chemotherapy, Drowning and Poisoning.

CARDIO VASCULAR SYSTEM.

- Methods of examination.
- Normal Heart and Pulmonary circulation.
- Basic ECG, Cardiac Ultrasonography (Echocardiography).
- Congenial Heart Disease.
- Arteritis, Aneurysms, Dissections, and complications.
- Acquired Heart Diseases, Cardiac Scintigraphy.
- Ischemic Heart Diseases, Cardiomyopathy.
- Cardiac Tumours including Myxoma, Rhabdomyoma.
- Pericardium-Pericardial infection, Effusion, Constrictive Pericarditis, Cardiac Tamponade.
- Pericardial Calcification.
- Arteriography, Venography and Lymphangiography.
- Perfusion studies and MRI of CVS
- Radiology of Post-operative Chest, Pace Maker, Electrode, and Prosthetic valve.

GASTRO INTESTINAL TRACT .

- Imaging of pharynx, esophagus, and its interpretation: Normal appearances and its pathologies.
- Imaging of stomach, Small Bowel and Large Bowel and its interpretation: Normal appearances and its pathologies.
- Methods of examinations and interpretation of normal appearance and diseases of Hepato- biliary System, Spleen, Pancreas, Mesentery and Retro peritoneum
- Acute abdomen - investigations and interpretations
- Radiology of Post-operative Abdomen and organ transplantation (Liver, Pancreas, etc.).
- Paediatric Gastrointestinal Radiology
- Abdominal Trauma.

- Tumour and predisposing conditions
- Infections and inflammatory conditions.
- Ischaemic conditions of Bowel and Mesentery and role of arteriography and Doppler study
- Endocrine Tumours and Venous Sampling
- Upper and lower GI bleeding and GI radiological investigations including Scintigraphy
- Radiological Interventions.

GENITO-URINARY SYSTEM

- Methods of investigation and normal appearances.
- Congenital lesions.
- Calculus disease of Genito-urinary System.
- Infection and inflammations involving Genito Urinary System.
- Tumours of Genito Urinary System.
- Reno vascular disease and Radiological interventions.
- Renal failure & transplant kidney.
- Miscellaneous including cystic disease of kidney, nephrocalcinosis, lower urinary tract obstruction/infection and post-operative problems.
- Trauma of Genito-urinary tract.
- Male Infertility imaging and interventions

ENDOCRINE SYSTEM

- Anatomy and basic physiology of various endocrine organs.
- Various imaging modalities (including Scintigraphy, PET. SPECT) and their interpretations.
- Imaging of Pituitary, Thyroid, Adrenal, Pancreas and other endocrine organs using various Radiological techniques.

SKELETAL SYSTEM .

- Radiography and other imaging modalities
  (like Isotope study including PET and SPECT, MRI, CT etc.)
- Structure of Bone, Bone formation, remodelling and growth.
- Congenital; skeletal anomalies and dysplasia.

- Bone and joint inflammation and infection – different types of arthritis.
- Degenerative disorders.
- Neoplasm including lymphoid and haematopoietic disorders.
- Metabolic and endocrine disorders.
- Skeletal trauma.
- Bone and Marrow injury.
- Avascular necrosis.
- Miscellaneous conditions – joint prosthesis, instruments – application imaging, Complications.
- Radio Frequency Ablation.

CENTRAL NERVOUS SYSTEM AND SKULL.

- Methods of examination and normal appearance of Skull, Brain, Spine and the Spinal cord.
- Applied embryology related to CNS.
- Infections and Inflammatory conditions of CNS
- Tumours and Tumour like conditions of CNS, Skull base and Calvarium.
- White matter diseases.
- Radiology of Dementia and epilepsy.
- Imaging in Hydrocephalus.
- Cranio-cerebral trauma.
- Congenital and degenerative lesions of Brain and Spinal cord.
- Disorders of Spine and Spinal cord.
- Cerebral Scintigraphy and its applications.
- Vascular lesions and interventions of CNS.
- Post-operative, Post Chemotherapy and Post Radiation changes.

OBSTETRICS AND GYNAECOLOGY.

- Obstetrics imaging (Normal/Abnormal).
- Gynaecological imaging (Normal/Abnormal).
- Infertility imaging and interventions, including ART.
- Gestational Trophoblastic Tumours.

- Radiology of ambiguous genitalia and Hermaphroditism.
- Doppler Study and IUGR.
- Radiological interventions in Gynaecology and Obstetrics.
- Miscellaneous conditions-Amniotic fluid embolism, Remnant Syndrome, Ovarian Hyper stimulation Syndrome etc.

ENT, EYE AND DENTAL IMAGING.

- Normal appearance and anatomy of Orbit, Eye Ball, PNS, and Temporal bone.
- Disease involving Larynx, PNS, Obits and Eyeball, Ear and Mastoids.
- Imaging and interpretation of teeth and jaws.
- Dental Radiography
- Pan tomography.
- Application of various imaging modalities like CT, MRI, and Isotope studies, PET, SPECT etc. in head and neck region.

SOFT TISSUES AND SMALL PARTS.

- Various disease, imaging and interpretations related to soft tissues and small parts (including Thyroid, Testis and Breast).
- Mammography and Sonography - Techniques and interpretations.
- Soft Tissue Radiography, Ultrasonography, Computed Tomography, and MRI.

SPECIAL TECHNIQUES.

- Ultrasonography: physical principles, techniques, and interpretation.
- Computed Tomography: physical principles, techniques, and interpretation.
- Magnetic Resonance Imaging: physical principles, techniques, and applications.
- Digital Subtraction Angiography: physical principles, techniques and applications.
- PET, SPECT: physical principles, techniques, and interpretation.
- Nuclear medicine as applied to Diagnostic Radiology.
- Newer developments in Diagnostic Radiology and Imaging- like picture archival and communication System (PACS).
- Filmless Radiology environment.
- Special Techniques and newer developments in Conventional Radiology, US, CT, MRI, PET, SPECT.

INTRVENTIONAL RADIOLOGY.

- Interventional Hepatobiliary procedures.
- Interventional Cardio-vascular procedures.
- Interventional Genito-urinary procedures.
- Interventional Gynaecological and Obstetrics Procedures.
- Venous Sampling Techniques.
- Radio frequency Ablation Techniques.
- Interventions in GIT.
- Other Ultrasonography and Computed Tomography/MRI guided procedures.
- Newer developments in Interventional Radiology.

2.11 No: of hours per subject (lecture-tutorial-seminar-group discussion)

THEORY LECTURES

Will be on Basic Sciences, Radiation Physics, Radiological Anatomy, Diagnostic Radiology and Imaging and interventional techniques.

Research Methodology	
General	30hrs
Biostatistics	30hrs
Ethics in Medical Research	10hrs
Basic Sciences	
Physiology	30 hrs.
Pathology	30 hrs.
Pharmacology	30 hrs.
Radiological Anatomy and Applied Embryology	60 hrs.
Radiation Physics	100 hrs
Radiography and Dark Room Procedures	100 hrs.
Radiodiagnosis	

Respiratory System and Chest	150 hrs
Cardio Vascular System	100 hrs
Gastro Intestinal Tract	150 hrs.
Genito-Urinary System	100 hrs.
Endocrine System	60 hrs.
Skeletal System	150 hrs.
Central Nervous System And Skull	100 hrs.
Obstetrics And Gynaecology	150 hrs.
Ent, Eye, and Dental Imaging	100 hrs.
Soft Tissues And Small Parts	60 hrs.
Special Techniques	100 hrs.
Interventional Radiology	180 hrs.

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Practical Training Programme will be as follows,

1st year	**Duration**
Uro-radiology	2 months
Gastrointestinal Radiology	2 months
Conventional Radiology/ Plain Radiography	3 months
Ultrasonography	2 months
CT and MRI introduction	1 month
Special investigations (Barium studies, IVU etc.)	2 months
2nd year	
Ultrasonography	3 months
CT and MRI	3 months
Plain Radiography and reporting	3 months

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Special Investigations	2 months
Cardiac Radiology	1 month

3rd year

Magnetic Resonance Imaging	2 month
Computed Tomography	2 months
Ultrasonography including Doppler studies	2 months
Special investigations (Angiography, Venography, Radio Frequency Ablation etc)	1 month
Interventional procedures	1 month
Conventional Radiology	1 month
Nuclear medicine	1 month
Elective posting in various other Departments	2 months

Both years

1. Journal club — once in a fortnight.
2. Topic presentation by PG student (Moderators– faculty members). — 3 days in a week.
3. Inter Departmental discussions.
    1. General medicine — once in every fort night.
    2. General Surgery — once in every fort night.
    3. Obstetrics and gynaecology — once in every fort night.
    4. Paediatrics — once in every fort night.
    5. Neurology (Medical) — once in every fort night.
    6. Neurology (Surgical) — once in every fort night.
    7. Gastroenterology (Medical) — once in every fort night.
    8. Gastroenterology (Surgical) — once in every fort night.
    9. Nephrology — once in every fort night.
    10. Urology (Surgical) — once in every fort night.
    11. Respiratory Medicine — once in every fort night.
    12. Thoracic Surgery — once in every month.
    13. Orthopaedics — once in every month.
    14. Cardiology — once in every month.
    15. Ophthalmology — once in every month.
    16. ENT — once in every month.

17. Oncology, Radiotherapy	once in every month.
18. Morbidity/ Mortality conference	once in every month.

2.12 Practical training given

As given under clause 2.11

2.13 Records

Log book has to be maintained.

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of final Examination of the candidate, for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Practical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification, it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re-evaluated by the University. If thesis is rejected by 2 experts, the candidate will lose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Speciality training of 1 month each in Cardiology, Pulmonology, Pain & Palliative medicine.

2.16 Project work to be done if any

Not applicable.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

1. Textbook of Radiology and imaging– by David Sutton.
2. Textbook of Gastrointestinal Radiology– by Richard M. Gore MD , Marc S. Levine MD
3. Grainger and Allison's Diagnostic Radiology– by Grainger and Allison.
4. Clarks positioning in Radiology.
5. Abram's Angiography: Vascular and Interventional Radiology– by Herbert L Abrams, M D Baum Stanley, Michael J Pentecost.
6. Caffey's Pediatric Diagnostic Imaging.
7. CT and a MR Imaging of the whole body– by John. R, Haaga, Charles F. Lanzieri , Robert C. Gilkeson.
8. Diagnostic Neuroradiology: A text/Atlas – by Anne G. Osborn.
9. Clinical ultrasound – by Cosgrove.
10. Bone and Joint Imaging – by Donald Resnick.
11. Diagnosis of bone and joint disorders – 6 volumes – by Donald Resnick.
12. Paediatric orthopediatric Radiology – by Ozonoff.
13. The Radiology of Skeletal Disorders – by Murray and Jacobson.
14. Medical Radiation physics– by W J Meredith.
15. The fundamentals of X– Ray and Radium Physics – by Joseph Selman.
16. Diagnostic ultrasound – by Carol and Rumak. S.R Wilson and J.W. Charboneau.
17. Ultrasonography in Obstetrics and Gynecology-by Peter W. Callen
18. Imaging of new born, infant, and young adult – by Leonard E Swischuck.
19. Felson's Principles of Chest Roentgenology – by Lawrence R. Goodman MD.
20. Clinical Urography – by Howard M. Pollack MD, Bruce L. McClennan M.
21. Christensen's Physics of Diagnostic Radiology – by Thomas S Curry, James E Dowdey, Robert C Murry .

2.19 Reference books [Recommended]

1. Radiology: diagnosis, imaging, intervention – by Taveras and Ferrucci.
2. Alimentary Tract Radiology – by Alexander R. Margulis.
3. Text book of diagnostic imaging– by Charles E. Putman, Carl E. Ravin
4. Merrill's atlas of Radiographic positions and procedures.
5. Interventional Radiology of the Abdomen – by Joseph T. M. D. Ferrucci, Jack Wittenberg
6. Taveras And Ferrucci's Radiology– by Ferrucci, Charles B. Higgins, Joseph T. Ferrucci.
7. Diagnosis of bone and joint disorders – 6 volumes – by Donald Resnick.
8. Paediatric orthopediatric Radiology – by Ozonoff.

9. Hand book of cardiovascular Magnetic Resonance Imaging– by Gerald M. Pohost, Krishna S. Nayak
10. Neuroimaging – by William W Orrisson
11. Magnetic Resonance Imaging in orthopaedic and Sports Medicine – by David W Stoller.
12. Clinical Urography – by Howard M. Pollack MD, Bruce L, McClennan M.

2.20 Journals

American journal of Roentgenology (AJR).
British Journal of Radiology.
Seminars in Roentgenology
Radiological Clinics of North America
American Journal of Neuroradiology.
Indian journal of Radiology and Imaging (IJRI).
Clinical Radiology.
Radiographics.
Radiology.
Pediatric Radiology.
Pediatric Radiology Journal
Acta Radiologica
Journal of Clinical Ultrasound
Ultrasound in Medicine and Biology
Ultrasound International
Ultrasound in Obstetrics and Gynecology
Neuroradiology
Skeletal Radiology (The Journal of Skeletal Radiology).
Clinical Imaging.
Seminars in ULTRA SOUND , CT and MR.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva voce).

3 EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two conferences (International/ National / State conference) of Radiodiagnosis during his/her training period. (This is considered as eligibility criteria for appearing for the examination).

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences with Research Methodology and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal and External) before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- ***Clinical / Practical and Oral***

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. (ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the speciality.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six.

1. **Scheme and Schedule of Examination**

Examination will be conducted on satisfactory completion of three years of training. There will be a Theory and Practical examination followed by oral / viva voce.

Theory

There will be four theory papers.

Paper I	Research Methodology, Basic Sciences as applied to Radiodiagnosis with Radiation Physics, Radiological Anatomy, Radiography, and Contrast Media.
Paper II	Respiratory System, Cardiovascular System, Gastro Intestinal Tract, Hepatobiliary System, Genito-urinary Tracts, and Endocrine System.
Paper III	Skeletal System, Skull and Central Nervous System, Obstetrics and Gynaecological imaging, ENT, Eyes, Dental, Jaw and Soft tissues.
Paper IV	Nuclear Medicine, PET,SPECT and Recent advances

Clinical

One long case (worked out/active current cases)

Two short cases (worked out/active current cases)

Viva voce

Viva Voce shall be conducted by all the examiners appointed.

Spotters

Each external examiner will show at least 20 spot films to the candidate for the evaluation in Practical examination.

Specimen for practical examination

Related to basic sciences and applied clinical science, Radiology, special and interventional procedures and dark room Techniques

Log book –evaluation to be done by all examiners.

2. **Distribution of Marks**

1	Theory paper I to IV	**400**
2	Practical	**300**
	One long case	150
	Two short cases	75 X2
3	Viva voce	**100**
	Spotters	40
	Specimen + film discussion+ Oral	40
	Log book (5X4 examiners)	20
	Marks in total	**800**

3. **Question Paper Pattern**

All questions Papers are short answer questions with two essay type questions, covering all Topics and systems including journals.

Candidate has to secure 40% marks for individual papers and 50% for the group total to have a pass in the University examination**.**

Max- is maximum marks, Min- is minimum for a pass.

Sl. No.	**Subject**	**Theory**		**Theory Group**		**Practical**				**Practical Group**		**Total**	
		University				**University**		**Viva voce**					
		Max	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**
1	Paper I	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

Please refer 3.3

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg. No.:……**

PG Degree Examinations in Radiodiagnosis (MD) ……20….

Paper I – Research Methodology, Basic Sciences applied to Radiodiagnosis, Radiation Physics, Radiological Anatomy, and Contrast Media.

Time: 3 hrs **Max marks: 100**

Answer all questions

Draw diagrams wherever necessary

Essays: **(2X20=40)**

1. Plan a radiology department for 500 bedded hospital.
2. State the principle of radiation protection. Discuss about the dose reduction strategies in fluoroscopy and radiography.

Short Answers: **(6x10=60)**

3. Principle of multi-detector row CT.
4. Basic image formation in MRI.
5. Radiological anatomy of retroperitoneum.
6. Radiographic technique of Townes' view and lordotic view
7. Reaction and management of reactions of contrast agents used in Radiology.
8. Discuss study designs in epidemiological research.

****

QP Code: **Reg.No.:……**

PG Degree Examinations in Radiodiagnosis (MD) ……20….

Paper II – Respiratory System, Cardiovascular System, Gastrointestinal Tract, Hepatobiliary System, Genitourinary Tract, and Endocrine Systems

Time: 3 hrs **Max marks: 100**

Answer all questions

Draw diagrams wherever necessary

Essays: **(2X20=40)**

1. Twenty five years old male patient presenting with hypertension. Discuss the following:
    - Differential diagnosis
    - Approach to imaging
    - Radiologist's role in management of the patient.
2. Discuss on HRCT Lung. Give HRCT findings various lung lesions commonly identified.

Short answers: **(6x10=80)**

3. Radiology of intussusception
4. Sonography in obstructive jaundice
5. Technique and usefulness of MR venography
6. Myocardial perfusion studies in nuclear medicine
7. Pulmonary CT angiography
8. Neonatal respiratory distress syndrome

****

QP Code: **Reg. No.:……**

PG Degree Examinations in Radiodiagnosis (MD)……20….

Paper III

Skeletal System, Skull and Central Nervous System, Obstetrics and Gynaecological imaging, ENT, Eyes, Dental, Jaw and Soft tissues.

Time: 3 hrs **Max marks: 100**

Answer all questions

Draw diagrams wherever necessary

Essays: **(2X20=40)**

1. Radiological evaluation of spinal tuberculosis and differential diagnosis.
2. Discuss on Conventional mammography and Breast MRI in evaluation of breast cancers.

Short essays: **(6x10=80)**

3. Subclavian steal syndrome
4. Imaging in ectopic pregnancy
5. Developmental dysplasia of the hip
6. Ultrasonography of orbit
7. Imaging in acute stroke
8. Evaluation of cervical spine injury

****

QP Code: **Reg.No.:……**

PG Degree Examinations in Radiodiagnosis (MD) - ……20….

Paper IV

Nuclear Medicine, PET, SPECT, and Recent Advances in Radiodiagnosis

Time: 3 hrs **Max marks: 100**

Answer all questions

Draw diagrams wherever necessary

Essays: **(2X20=40)**

1. Recent advances, including techniques of magnetic resonance perfusion imaging, of the brain**.**
2. Embolization and materials used for embolization in interventional radiology

Short answers: **(6x10=80)**

3. Radio frequency ablations.
4. M R spectroscopy applications.
5. Electron beam CT.
6. Magnetic resonance elastography.
7. Fusion imaging.
8. Digital radiography versus computed radiography.

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical exams

Present in clause 3.3.

3.9 Number of examiners needed (Internal & External) and their qualifications

The eligibility for PG Examiners should be as per MCI Norms. i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years' experience as a postgraduate examiner in the concerned subject. For the Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the internal examiners shall be a Professor or Head of the Department.

3.10 Details of Viva Voce: Division of Marks

Present in clause 3.3

4 INTERNSHIP

Not applicable.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

FORMAT OF LOG BOOK

Medical college ……..

Department of ……

Log book of

The Degree of ……

Name……..

1. Biodata of the candidate
2. Experience before joining the course
3. Details of posting :
    - First year
    - Second year
    - Third year
4. Research work
5. Participation in conferences – CME programmes
6. Details of leave availed
7. Details of participation in academic programme
8. Seminars /symposia presented
9. Statistical meetings / departmental mortality meetings
10. Journal clubs
11. Teaching assignments – undergraduates / nurses/paramedical.
12. Special duties (if any)
13. Miscellaneous
14. Daily activities record (blank pages)

    Two pages for each month x 72 pages
15. Summary

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICNE

MD RADIOTHERAPY

Course Code 214

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:
M.D. RADIOTHERAPY

2.2 Objectives of course
GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and/ or Medical teachers in the specialty of oncology:-

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to:-

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.

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- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

AIMS & OBJECTIVES OF CURRICULUM

M.D Radiotherapy course is the three year postgraduate resident training in speciality of Oncology. Curriculum aims in training the postgraduate students in M.D. Radiotherapy to be specialist in clinical oncology on successful completion of course, covering entire Medical Oncology and Radiation Oncology. The overall aim of the curriculum is to ensure that the cancer patients will get the chance of specialized comprehensive treatment from qualified physicians.

The number of patients with malignancy in increasing day by day worldwide. There is rapid growth in medical technology and advances in the knowledge of cancer biology with impacts on genetics, early screening, early diagnosis, staging and overall treatment of cancer. These developments has led to coordinated multidisciplinary approach to treatment of individual malignancy. This definitely led to the need of specialized training in various aspects of cancer diagnosis and comprehensive cancer treatment. Trainees' are provided supervised full time clinical training in broad spectrum of neoplastic diseases. Full time clinical training means the trainees' professional time and effort during a standard working week is dedicated to clinical activities, both patient care & education. These include primary care of cancer patients in emergency room, outpatient department, and supervision of cancer patients in the inpatient wards, oncology consultations, oncology rounds, scheduled clinical conferences& journal clubs, performance of minor surgical procedures. Attending local, national & international oncology conferences is also the part of this curriculum. Clinical activities also include research activities and successful completion of thesis in Oncology.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

1. Basic Sciences
   - Anatomy
   - Tumour Pathology
   - Radiobiology & Cancer Biology

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- Radiation Physics
- Statistical Basis For Planning & Interpretation Of Clinical Trials And Research

2. Clinical Oncology
    1. Medical Oncology
    2. Radiation Oncology
3. Cancer Chemotherapy and Pharmacology

4. Disciplines allied to Clinical Oncology– Haemato-oncology, Paediatric Oncology, Nuclear medicine, Imageology
5. Preventive & Community Oncology
6. Pain &Palliative care
7. Training
8. Communication Skills
9. Administration

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

1. Basic Sciences – which includes Anatomy, Tumour Pathology, Radiobiology & Cancer Biology, Radiation Physics, and Medical Statistics.
2. Clinical Oncology - which includes Medical and Radiation Oncology.
3. Cancer Chemotherapy and Pharmacology
4. Disciplines allied to Clinical Oncology– Haemato-oncology, Paediatric Oncology, Nuclear medicine, Imageology
5. Preventive & Community Oncology
6. Pain &Palliative care

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

Present in clause 2.10 of the curriculum.

2.8 Branches if any with definition

Present in clause 2.10 of the curriculum.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training,

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and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

  - The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

    - Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

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Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

2.10 Content of each subject in each year

1. BASIC SCIENCES

a) **ANATOMY**

Knowledge of surface anatomy pertaining to Oncology

Detailed knowledge of the all organs

Detailed knowledge of the lymphatic system of all organs-regions

Practical familiarity with the radiographic appearance of important regions (living anatomy)

Cross sectional anatomy

b) **PATHOLOGY**

General tumour Pathology

Definitions of & distinction between different types of growth disorders (i.e.; distinction between hyperplasia, hypertrophy, regeneration, malformations and neoplasia.

Malignant transformation:

Initiation and promotion stages of carcinogenesis.

Mode of origin – monoclonal, polyclonal, unifocal, multifocal structural and functional changes in cellular components.

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Aetiology of cancer including genetic predisposition & congenital syndromes chromosomal abnormalities & hereditary tumours, Proto-oncogenes, oncogenes, tumour suppressor genes & viruses in the causation of malignancy.

Multifactorial causation including Nutritional aspects in cancer causation and prevention, Environmental causes of cancer, Biological – protozoal, bacterial, viral, Chemical – classes of carcinogenic chemicals, smoking, Physical – trauma, irradiation (UV rays, other electromagnetic radiation including, X-rays and gamma rays and particulate radiation), Common occupational cancers & experimental tumours in animals relationship to human mutagenicity. Aetiology, mechanisms of carcinogenesis, known types of carcinogens & their effects upon the cell. The relative importance of different factors in the causation and spread of human cancer including rate of tumour growth, methods of measurement, factors affecting growth rate, mechanisms of spread, local effects of tumours, local & systemic reactions to tumours, effects of therapy on tumours & normal tissues. Criteria for tumour diagnosis macroscopic, histological & cytological uses & value of biopsy material.

Classification of tumours – histogenic, histological, behavioural & immunological nomenclature – solid tumours, lympho-proliferative disorders

Structure & organization of tumours- vascular supply, stroma etc.

Systems of grading Endocrine aspects of malignancy: - Production of hormones by tumours, effect of hormones on tumours, paracrine effects of tumours Para-neoplastic syndromes. Tumour Immunology including organization & development of the immune system and the role response in disease, cellular basis of immunity & measurement of immune function, graft versus host reaction, tumour immunity, tolerance, enhancement, Immune surveillance hypothesis, Immunological markers in diagnosis & monitoring, the I ILA systems & molecular biology for diagnostic and therapeutic purposes.

General Haematology

1. Proper use and care of common instruments such as light microscope, centrifuge, water baths, freezers etc.
2. Blood sample collection - venepuncture and finger prick methods of sample collection, types of anticoagulants, containers and the effects of delay in processing and storage.
3. Review of normal and abnormal blood films with emphasis on morphology of red cells, white cells and platelets.
4. Performance of bone marrow aspiration; trephine needle biopsy

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5. Staining and diagnostic evaluation of bone marrow aspirates. Interpretation of cytochemical stains including Sudan Black, Myeloperoxidase, specific and nonspecific esterase, acid phosphatase, PAS and iron staining.

Cytogenetics

Familiarization with Cytogenetics, understanding the principles of Cytogenetics and appreciating the relevance and significance of chromosomes in diagnostic haematology and oncology

Transfusion Medicine

1. Donor evaluation & recruitment.
2. Clinical evaluation and screening of patients and donors for hematopoietic stem cell transplantation.
3. Phlebotomy of donors.
4. Collection, cryopreservation and storage of hematopoietic stem cells.

c) **CANCER BIOLOGY**

Cell Proliferation, Differentiation, and Apoptosis

Growth Factor Signal Transduction in Cancer

Oncogenes

Tumour Suppressor Gene Defects in Recurring Chromosome Rearrangements in Human Cancer

Biochemistry of Cancer

Invasion and Metastases

Tumour Angiogenesis

Tumour Immunology

Molecular Biology

Understanding the principals involved in the molecular diagnosis of haematological and Oncological disorders.

1. PCR
2. FISH
3. RFLP and Southern Blotting.
4. Microarray technology

Flow Cytometry: - A working knowledge of the principle and practice of flow cytometry and interpretation of the clinical significance of common leukocyte immunophenotypes

Cancer Etiology

Genetic Predisposition to Cancer

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Chemical Carcinogenesis

Hormones and the Aetiology of Cancer

Ionizing Radiation

Ultraviolet Radiation Carcinogenesis

Physical Carcinogens

Trauma and Inflammation Tumour Viruses Herpes viruses Papillomaviruses and Cervical Neoplasia Hepatitis Viruses Parasites

Cancer Epidemiology

d) **RADIATION PHYSICS**

The aim of this subject is to provide the future Clinical Oncologist with the knowledge of physics required in clinical practice.

An understanding of the principles of planning & carrying out treatment is a necessary prerequisite & will be enhanced by the study of this subject.

A familiarity with the physics of electromagnetic radiation and atomic structure will be required. With respect to their implications for accurate dose delivery in clinical radiation therapy, applicability, limitations, advantages & disadvantages of the various devices & techniques should receive particular attention.

Candidates should be encouraged to observe & gain practical experience with the equipment & techniques used in radiotherapy in clinical oncology departments Structure of Matter: Constituents of atoms, Atomic and mass numbers, Atomic and mass energy units, Electron shells, Atomic energy levels, Nuclear forces, Nuclear energy levels, Electromagnetic radiation, Electromagnetic spectrum, Energy quantization, Relationship between Wavelength, Frequency, Energy Nuclear Transformations: Natural and artificial radioactivity, Decay constant, Activity, Physical, Biological and Effective half-lives, Mean life, Decay processes, Radioactive series, Radioactive equilibrium Production of X-rays : The X-ray tube, Physics of X-ray production, Continuous spectrum, Characteristic spectrum, Efficiency of X-ray production, Distribution of X-rays in space, Specifications of beam quality, Measurement of beam quality, Filters and filtration Interaction of radiation with matter: Attenuation, Scattering, Absorption, Transmission, Attenuation coefficient, Half Value Layer (HVL), Energy transfer, Absorption and their coefficients. Photoelectric effect, Compton Effect, Pair production. Relative importance of different attenuation processes at various photon energies. Electron interactions with matter: Energy loss

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mechanisms – Collisional losses, Radioactive losses, Ionization, Excitation, Heat production, Delta rays, Polarization effects, Scattering, Stopping power, Absorbed dose, secondary electrons.

Interactions of charged particles: Ionization vs. Energy, Stopping Power, Linear Energy Transfer (LET), Bragg curve, Definition of particle range. Measurement of radiation: Radiation Detectors: Gas, Solid – state, Scintillation, Thermo luminescence, Visual Imaging (Film, Fluorescent screens), and their examples. Exposure, Dose, Kerma: Definitions, Units (Old, New), Inter-relationships between units, Variation with energy and material. Measurements of exposure (Free air chamber, Thimble chamber), Calibration of therapy beams: Concepts, Phantoms, Protocols (TG 21, IAEA TRS- 398, TG 51) Dose determinants in practice (brief outline only, details not required)

Radiotherapy Equipment: Grenz rays, Contact, Superficial, Orthovoltage or Deep therapy, Supervoltage, Megavoltage therapy. Therapy and diagnostic X-ray units – comparison. Filters, factors affecting output. Co-60 units : Comprehensive description of the unit, Safety mechanisms, Source capsule Linear accelerators, Source capsule Linear accelerators : History, Development, Detailed description of modern, dual mode linear accelerator, Linac head and its constituents , Safety mechanisms, Computer controlled linacs, Record and Verify systems. Relative merits and demerits of Co-60 and linac units. Simulators: Need for them, detailed description of a typical unit, simulator CT. Dose distributions, Beam modifications and shaping in Teletherapy beams. Characteristics of photon beams: Quality of beams, Difference between MV and MeV, Primary and scattered radiation. Percentage depth dose, Tissue-Air Ratio, Scatter Air Ratio, Tissue-Phantom Ratio, Tissue Maximum Ratio, Scatter Maximum Ratio, Back Scatter Factor, Peak Scatter Factor, Off-Axis Ratio, Variation of these parameters with depth, filed size, source-skin distance, beam quality or energy, beam flattening filter, target material. Central axis depth dose profiles for various energies.

Equivalent square concept, Surface dose (entrance and exit), Skin sparing effect, Output factors. Practical applications: Co-60 calculations (SSD, and SAD technique), Accelerator calculations (SSD, and SAD technique) Beam profiles Isodose curves, Charts, Flatness, Symmetry, Penumbra (Geometric, Transmission, and Physical), Field size definition Body in homogeneities: Effects of patient contour, Bone, Lung cavities, Prosthesis on dose distribution. Dose within bone / lung cavities, Interface effects, Electronic disequilibrium. Wedge filters and their use, Wedge angle, Wedge Factors, Wedge systems (External, In built Universal, Dynamic / Virtual), Wedge Isodose curves.

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Other beams modifying and shaping devices: Methods of compensation for patient contour variation and / or tissue inhomogeneity – Bolus, Build-up material, Compensators, Merits, and Demerits. Shielding of dose limiting tissue: Non-divergent and divergent beam block, Independent jaws, multifocal collimators, Merits and Demerits.

Principles of Treatment Planning

Treatment planning for photon beams: ICRU an NCAP terminologies. Determination of body contour and localization: Plain film, Fluoroscopy, CT, MRI, Ultrasonography, Simulator based. Methods of correction for beam's oblique incidence, and body inhomogeneties. SSD technique and isocentric (SAD) technique: Descriptions and advantages of SAD technique

Combination of fields: Methods of field addition, Parallel opposed fields, Patient thickness vs. Dose uniformity for different energies in a parallel opposed setup, multiple fields (3 fields, 4 field box and other techniques). Examples of above arrangements of fields is SSD and SAD techniques, Integral Dose. Wedge field technique, Rotation Therapy (Arc, and Skip), Tangential fields. Beam balancing by weighting. Total and hemi-body irradiation. Field junctions. Limitations of manual planning. Description of a treatment planning system (TPS): 2D and 3D TPS. Beam data input, Patient data input (simple contour, CT, MR data, Advantages of transfer through media). Input devices Digitizer, floppies, DAT devices, Magneto-optical disks, direct link with CT, MR). Beam selection and placement, Beam selection and placement, Beam's Eys View (BEV), Dose calculation and display (Point dose, Isodose curves, Isodose surfaces, Colour wash). Plan optimization, Plan evaluation tools: Dose volume Histograms (Cumulative and Differential), Hard copy output, Storage and retrieval of plans.

Alignment and Immobilization: External and internal reference marks, Importance of

Immobilization methods (Plaster of Paris casts, Perspex casts, bite block, shells, head rests, neck roll, Alpha-Cradles. Thermoplastic materials, polyurethane foams), Methods of beam marks, and front / back pointers). Treatment execution: Light field, Cross hair, ODIs, Scales in treatment machines. Treatment verification: Port films, Electronic portal imaging devices, Invivo patient dosimetry (TLD, diode detectors, MOSFET, Film, etc) Changes in patient position, target volume, and critical volume during course of treatment. Electron Beam Therapy Production of electron beams: Production using accelerators, Characteristics of electrons. Surface dose, percentage depth dose, beam profiles, Isodose curves and charts, Flatness and Symmetry. Beam collimation, variation of percentage depth dose and output with filed size, and SSD, photon contamination. Energy spectrum, Energy specifications, variation of mean energy with depth. Suitability of

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measuring instruments for electron beam dosimetry Treatment planning: Energy and field size choice, air gaps, and obliquity, Tissue in homogeneity – lung, bone, air filled cavities. Field junctions (with either electron or photon beam). External and internal shielding. Arc therapy, Use of bolus in electron beam. Total Skin Electron Irradiation, Intraoperative Radiation therapy. Physical Principles of Brachytherapy: Properties of an ideal brachytherapy source, Sources used in brachytherapy: Ra-226, Cs-137, Ir-192, Au-198, Co-60, I-125, Sr-90, Yt-90, Ru-106, Ta-182 and other new radionuclides, their complete physical properties, Radium hazards. Source construction including filtration, comparative advantages of these radionuclides. Histological background. Radiation and Dose units: Activity used, Exposure, Absorbed dose, mg-hr, curie, milli-curie destroyed, milligram Radium equivalent, roentgen, rad, gray. Source strength specification, Brachytherapy Dose calibrator. Technique: Preloaded, After loading (manual and remote), Merits and Demerits. Surface, Interstitial, Intracavitary, Intraluminal, Intravascular brachytherapy, Low, Medium, High and Pulsed dose rates. Remote after loading machines.

Dosage Systems: Manchester System, Paris System Treatment Planning: Patient selection, Volume specification, Geometry of implant, Number, Strength and Distribution of radioactive sources, Source localization, Dose calculation, Dose rate specification, Record keeping ICRU 38. Radiation Safety: Planning of brachytherapy facility, Rooms and equipment, Storage and `Movement control, Source inventory, Disposal, Regulatory requirements Beta-ray brachytherapy including methods of use, inspection, storage and transport of sources, dose distribution Unsealed radionuclides: Concepts of uptake, distribution and elimination, Activities used in clinical practice, Estimation of dose to target tissues, and critical organs, Procedures for administering radionuclides to patients. Quality Assurance in radiotherapy.(QART) Overview of QART: Need for quality system in Radiotherapy, Quality system: Definition and practical advantages, Construction, Development and implementation of a Quality system Quality Assurance of simulator,Tips,Co-60,Linear Accelerator Acceptance testing of Simulator, TPS, Co-60,Linear Accelerator Radiation Protection and Regulatory Aspects: Statutory Framework – Principles underlying International Commission on Radiation Protection (ICRP) recommendations, ICRP and National radiation protection i.e; Atomic Energy Regulatory Board (AERB) standards. Effective dose limits (ICRP and AERB) Protection mechanisms: Time, Distance and shielding. Concept of “As low as Reasonably Achievable” (ALARA) Personnel and Area Monitoring; Need for personnel monitoring, Principles of film badge, TLD badge used for personnel monitoring. Pocket dosimeter. Need for area monitoring, Gamma Zone monitors, Survey meters Regulatory aspects:

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Procedural steps for installation and commissioning of a new radiotherapy facility (Teletherapy and Brachytherapy). Approval of Standing Committee on Radiotherapy Development Programme. Type approval of unit. Site plan, Layout of installation / Associated facility: Primary, Secondary barriers, leakage and scattered radiation. Regulatory requirement in procurement of teletherapy / brachytherapy source(s). Construction of building, Qualified staff, Procurement of instruments, and accessories, installation of unit and performance tests. Calibration of unit, RP & AD approval for clinical commissioning of the unit.

Other regulatory requirements:

Regulatory consent, NOCs, Periodical reports to AERB and Radiological Physics and

Advisory Division (RP & AD), Bhaba Atomic Research Centre (BARC)

Advancements in Radiation Oncology: Virtual Simulation: Principle, CT Simulation, TPS based virtual simulation, Differences, Merits and Demerits, Practical considerations

Conformal radiotherapy (CRT): Principles, Advantages over conventional methods, Essential requirements for conformal radiotherapy.

Various methods of CRT:

With customized field shaping using conventional coplanar beams.

Multiple non-coplanar MLC beams conforming to target shape.

Stereotactic radiotherapy

Principle of inverse planning and Intensity Modulated Radiation Therapy (IMRT)

- -Using 3D compensator
- -Static IMRT (Step and Shoot technique)
- -Dynamic IMRT (sliding window technique)
- -Dynamic arc IMRT
- -Micro –MLC
- -Tomotherapy methods

Time gated (4D) radiotherapy

Merits and demerits of IMRT

IGRT

Stereotactic irradiation methods: Physics Principles, Techniques, Description of units

(Gamma Knife and Linac based). Merits and demerits, Stereotactic Radiosurgery (SRS) and Stereotactic Radiotherapy (SRT), whole body stereotactic frame.

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Networking in radiotherapy: Networking of planning and treatment units in radiotherapy department including Picture Archival Communication System (PACS), Advantages, Patient Data Management

e) **RADIOBIOLOGY**

Introduction to Radiation Biology

Radiation interaction with matter

Types of radiation, excitation and ionization.

Radiation chemistry: direct and indirect effects, free radicals, oxygen effect and free radical scavengers, LET and RBE theory, dual action theory, intracellular repair, general knowledge of repair models.

Introduction to factors influencing radiation response.

Physical factors: dose, dose quality, dose rate, temperature Chemical factors: Oxygen, radiosensitizers, radioprotectors

Biological factors: type of organism, cell type and stage, cell density and configuration, age, sex.

Host factors: Partial or whole body exposure.

Relevance of radiation biology to radiotherapy

Interaction of ionizing radiation on mammalian cells.

The cell: structure and function; relative radiosensitivity of nucleus and cytoplasm, mitosis, cell cycle, principles of DNA, RNA and protein synthesis, radiation effects on DNA, strand breakage and repair, common molecular biology techniques.

Cell injury by radiation: damage to cell organelle like chromatids, chromosomes; interphase death, apoptosis, mitotic death, micronucleus induction, SLD, PLD, Oxygen effect: mechanism, hypoxia, OER, reoxygenation in tumours, significance in radiotherapy. Dose rate.

Brachytherapy sources including 252f. Radiobiology of low, high dose rate & pulsed brachytherapy, hyper fractionation, significance in radiotherapy. Effects of low LET and high LET radiation on cell. Cell survival curves. Effect of sensitizing and protective agent. Dose modifying factors and their determination. Variation of response with growth and the progression of cell through the phases of cell cycle. Physical factors influencing cell survival; relative biological effectiveness (RBE); its definition and determination, dependence upon linear energy transfer, dose, dose rate and fractionation.

Hyperthermic and photodynamic injury.

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Biological hazards of irradiation. Hyperthermic and photodynamic injury.

Biological hazards of irradiation; dose protection and LET, effects on the embryo and the foetus, life shortening, leukemogenesis and carcinogenesis, genetic and somatic hazards for exposed individuals and population. Biological basis of radiological protection. Organ radiosensitivity and radioresponsiveness, concept of therapeutic index. Acute effects on Radiation, Concept of mean lethal dose, Radiation Syndromes: BM, GI, CNS, Cutaneous Suppression of immune System: mechanism, Consequences

Total Body irradiation Biological dosimetry: Blood counts, BM mitotic index. Chromosome aberrations in peripheral blood lymphocytes

Radiation accidents: typical examples

Radiation effects on major organs/tissues

Acute & late effects on all normal organs & tissues including connective tissue, bone marrow, bones, gonads, eye, skin, lung, heart, central nervous system tissues, peripheral nerves, oesophagus, intestine, kidney, liver & thyroid with special reference to treatment – induced sequelae after doses employed in radiotherapy.

Normal tissue tolerances

Late effects of radiation (somatic)

Sterility, cataracts and cancer

Carcinogenesis: mechanism in vitro and in vivo, oncogenes and anti-oncogenes Radiation induced cancer of occupational, medical or military origin.

Recent controversial results for low level exposure, risk estimates

Late effects of Radiation (Genetic)

Mutations: definition, types, potential hazards.

Low level radiation: sources, potential hazards, stochastic and deterministic nonstochastic effects, high background areas and cancer.

Effects of Radiation on Human Embryo & Fetus

Lethality, congenital abnormalities and late effects (Leukaemia and childhood cancer), severe mental retardation. Doses involved.

Biology and Radiation Response of Tumours

Tumours growth: Kinetics of tumour response. Growth fraction, cell loss factor.

Volume doubling times, potential volume doubling times, repopulation, and accelerated repopulation.

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Radiocurability: definition, factors involved, tumour control probability curves

Factors determining tumour regression rates. Causes of failure to control tumours by radiation: tumour related, host related technical/mechanical errors.

Relationship between clonogen numbers and tumour control probability. Local tumour control and impact on survival.

Applied Radiobiology

Fractionation: rationale, factors involved (5 R's)

Time, Dose and fractionation relationship isoeffect curves, isoeffect relationships, e.g; NSD, CRE formalisms and their limitations, partial tolerance, means of summating partial tolerance, steepness of dose response curves. Multi-target, two component and linear quadratic model. A/b ratios for acute and late effects and means for deriving these values. Isoeffective formulae. Clinical applications of the L-Q model. Hyperfractionation, accelerated fractionation, hypofractionation, CHART, split dose treatments. Brachytherapy – low dose rate, high dose rate and pulsed treatments. Introduction to new techniques to optimize radio-curability; combination therapy (adjuvant surgery or chemotherapy), hyperthermia, hypoxic cell radio-sensitize, high LET radiation. Photodynamic therapy. The volume effect, general principles and current hypotheses. Shrinking Field technique.

Combination Radiation-surgery

Pre, post and intra operative radiation.

Rationale, radiobiological factors, current clinical results.

Irradiation of sub-clinical disease, debulking surgery, importance of clonogen numbers.

Combination Radiation-Chemotherapy

Definitions of radiosensitiser, synergism, potentiation, antagonism, Radiosensitisers: types, mechanism.

Hyperthermia

Sources, rationale (historical examples), advantages and disadvantages, thermotolerance.

Cellular damage: comparison and contrast with radiation, thermal and non-thermal effects of ultrasound, microwaves, radiofrequency, etc. general host responses (immunology, metastases)

Use along with radiotherapy and chemotherapy: optimum sequencing of combined modalities.

Current limitations to the clinical use of hyperthermia.

High LET Radiation

Comparison and contrast with low LET radiation

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Neutrons: Source (including 252 Cf) and boron neutron capture (outline only). Advantages and disadvantages of neutrons, RBE values, hazards of low dose and low energy neutron, use in radiotherapy, combination with low LET, current clinical results.

Other high LET particles: protons, mesons, high-energy heavy nuclei, application to radiotherapy, current clinical results.

f) STASTISTICAL BASIS FOR PLANNING AND INTERPRETATION OF CLINICAL TRIALS

Retrospective & Prospective studies

Controlled & uncontrolled trials

Single blind & double blind studies

Phase I, II & III trials

Ethics (Helsinki declaration).

Planning a trial

Establishing objectives – short term and long term

Determining the appropriate criteria

Establishing grounds for inclusion and exclusion of patients

Determining how many treatment schedules are to be completed

Determining the treatment schedules and any appropriate modifications

Determining the method of allocation of treatment; the allocation ratio and the method and timing of randomization

Determining what measures are to be taken, how they will be taken, who will take them, at what times (s) and where they will be recorded.

Designing, the appropriate forms of documentation

Determining the proposed duration of the trial, either in terms of a fixed closing date, or the entry of a predetermined number of patients.

Establishing conditions under which the trial may be terminated earlier than planned & procedures for detecting these conditions.

Re-assessing the proposed trial in terms of ethics, appropriateness to the short & long terms objectives, feasibility & the availability of resources.

Writing the protocol

Running a pilot study

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2. CLINICAL ONCOLOGY

- Comprehensive cancer care including Medical Oncology &Radiation Oncology

a. MEDICAL ONCOLOGY

1. **General Oncology**

Cancer prevention

Prevention of Tobacco-Related Cancers

Nutrition in the Etiology and Prevention of Cancer

Chemo-prevention of Cancer

Cancer Chemotherapy

Cytokinetics,

Drug Resistance and its Clinical Circumvention,

Principles of Dose, Schedule, and Combination Chemotherapy

Regional Chemotherapy

Animal Models in Developmental Therapeutics In Vitro and In Vivo Predictive Tests

Pharmacology

Toxicology by Organ System

Basic Principles of chemotherapy

Chemotherapy drugs

Newer chemotherapeutic agents

Chemotherapeutic Agents

Folate Antagonists

Pyrimidine and Purine Antimetabolites

Alkylating Agents and Platinum Antitumour Compounds

Anthracyclines and DNA Intercalators /Epipodophyllotoxins / DNA Topoisomerases

Microtubule-Targeting Anticancer Drugs Derived from Plants and Microbes: Vinca Alkaloids, Taxanes, and Epothilones, Asparaginase

Basic for designing different chemotherapy schedules. Standard chemotherapy schedules.

Chemotherapy practice in various malignancies

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Chemotherapy practice & results/toxicities in sequential & concomitant chemo-radiotherapy.

Supportive care for chemotherapy.

The basic principles underlying the use of chemotherapeutic agents.

Classification and mode of action of cytotoxic drugs. The principles of cell kill by chemotherapeutic agents, drug resistance, phase specific and cycle specific action. Drug administration. The general principles of pharmacokinetics; factors affecting drug concentration 'in vivo' including route and timing of administration, drug activation, plasma concentration, metabolism and clearance.

Principles of combinations of therapy, dose response curves, adjuvant and neo-adjuvant chemotherapy, sanctuary sites, high dose chemotherapy, and regional chemotherapy. Toxicity of drugs. Early, intermediate and late genetic and somatic effects of common classes of anticancer drugs. Precautions in the safe handling of cytotoxic drugs.

Endocrine manipulation and biological response modifiers. An understanding of the mode of action and side effects of common hormonal preparations used in cancer therapy (including corticosteroids).

Use of the major biological response modifiers such as interferon, interleukins and growth factors and knowledge of their side effects.

Assessment of New Agents. Principles of phase I, II, and III studies.

Gene Therapy

Principles of Endocrine Therapy

Steroid Hormone Binding and Hormone Receptors

Hypothalamic and Other Peptide Hormones

Corticosteroids

Estrogens and Antiestrogens

Clinical Use of Aromatase Inhibitors in Breast Carcinoma

Progestin

Androgen Deprivation Strategies in the Treatment of Advanced Prostate Cancer

Principles of Biotherapeutics

Immunostimulants

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Active Specific Immunotherapy with Vaccines Interferons, Cytokines: Biology and Applications in Cancer Medicine

Hematopoietic Growth Factors.

Monoclonal Sclerotherapy

Cancer Gene Therapy

Transplantation

Autologous Bone Marrow and Stem Cell Transplantation

Transplantation of Allogeneic Hematopoietic Cells for the Treatment of Malignancies

The student must be familiar with current indications and results of bone marrow transplantation in various diseases.

1. Donor selection

   HLA typing and MLR in bone marrow transplantation, screening of Donor
2. Conditioning regimens -the trainee must be familiar with the different conditioning regimens, principles of their use in different disorders and complications
3. Harvesting and manipulation of the bone marrow

   Bone marrow collection, red cell or plasma reduction, peripheral blood stem cell mobilization and collection, cryopreservation, Transfusion of marrow. Purging of marrow –T cell depletion.
4. Transplantation immunology

   Histocompatibility, graft versus host disease – diagnosis and management. Immune reconstitution following transplantation.
5. Management of post-transplant patient

2. **DIAGNOSIS , STAGING & MANAGEMENT OF CANCER**

A thorough knowledge and experience to be developed in diagnostic modalities, staging work up, treatment, complications, follow up. All the international and national standard treatment guidelines like NCCN, ESMO, ASCO, ESTRO, NICE, TMH etc must be readily and judiciously used. A specialized knowledge of comprehensive and multidisciplinary approach for cancer treatment is expected on completion of the course.

1) NEOPLASMS OF THE CENTRAL NERVOUS SYSTEM

   Neoplasms of the Central Nervous System

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2) NEOPLASMS OF THE EYE

Neoplasms of the Eye

3) NEOPLASMS OF THE ENDOCRINE GLANDS

Pituitary Neoplasms

Neoplasms of the Thyroid

Neoplasms of the Adrenal Cortex

Neoplasms of the Neuroendocrine System

Endocrine System

4) NEOPLASMS OF THE HEAD AND NECK

Head and Neck Cancer

Odontogenic Tumours

5) NEOPLASMS OF THE THORAX

Cancer of the Lung

Malignant Mesothelioma

Thymomas and Thymic Tumours

6) NEOPLASMS OF THE FEMALE REPRODUCTIVE ORGANS

Neoplasms of the Vulva and Vagina

Neoplasms of the Cervix

Endometrial Cancer

Neoplasms of the Fallopian Tube

Ovarian Cancer

Gestational Trophoblastic Disease

7) NEOPLASMS OF THE BREAST

Neoplasms of the Breast

8) NEOPLASMS OF THE SKIN

Neoplasms of the Skin

9) MALIGNANT MELANOMA

Malignant Melanoma

10) NEOPLASMS OF THE BONE AND SOFT TISSUE

Bone Tumours & Sarcomas of Non-osseous Tissues

11) NEOPLASMS OF THE HEMATOPOIETIC SYSTEM

Myelo-dysplastic Syndrome

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Acute Myeloid Leukemia in Adults

Chronic Myeloid Leukemia

Acute Lymphocytic Leukemia in Adults

Chronic Lymphocytic Leukemia

Tumours of the Heart and Great Vessels

Primary Germ Cell Tumours of the Thorax

Metastatic Tumours in the Thorax Hairy-Cell Leukemia

Hodgkin's disease

Non–Hodgkin's Lymphomas

Mycosis Fungoides and the Sezary Syndrome

Plasma Cell Tumours

Mast Cell Leukemia and Other Mast Cell Neoplasms

Polycythemia Vera and Essential Thrombocytopenia

12) NEOPLASMS OF THE ALIMENTARY CANAL

Neoplasms of the Oesophagus

Neoplasms of the Stomach

Primary Neoplasms of the Liver

Treatment of Liver Metastases

The Gallbladder

Diagnosis and Management of Biliary Tract Cancer

Neoplasms of the Ampulla of Vater

Neoplasms of the Exocrine Pancreas

Neoplasms of the Small Intestine, Vermiform Appendix, and Peritoneum

Adenocarcinoma of the Colon and Rectum

Neoplasms of the Anus

13) NEOPLASMS OF THE GENITOURINARY TRACT

Renal Cell Carcinoma

Neoplasms of the Renal Pelvis and Ureter

Bladder Cancer

Neoplasms of the Prostate

Neoplasms of the Penis

Neoplasms of the Testis

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14) NEOPLASMS IN AIDS

Neoplasms in Acquired Immunodeficiency Syndrome

15) NEOPLASMS OF UNKNOWN PRIMARY SITE

Neoplasms of Unknown Primary Site

16) NEOPLASMS IN CHILDREN

a. Principles and Practice of Pediatric Oncology
b. Incidence, Origins, Epidemiology
c. Principles of Pediatric Radiation Oncology
d. Late Effects of Treatment of Cancer in Children and Adolescents
e. Childhood Acute Lymphoblastic Leukemia
f. Pediatric Acute Myeloid Leukemia
g. g Hodgkin's Disease in Children and Adolescents
h. Non-Hodgkin's Lymphoma in Children
i. Langerhans' Cell Histiocytosis
j. j Hepatic Tumours
k. Renal Tumours of Childhood
l. Germ Cell Tumours
m. Neuroblastoma
n. Soft Tissue Sarcomas of Childhood

17) COMPLICATIONS OF CANCER AND ITS TREATMENT

Management of Cancer Pain

Anorexia and Cachexia

Antiemetic Therapy

Neurologic Complications

Dermatologic Complications of Cancer Chemotherapy

Skeletal Complications

Hematologic Complications and Blood Bank Support

Coagulopathic Complications of Cancer

Urologic Complications

Cardiac Complications

Respiratory Complications

Liver Function and Hepatotoxicity in Cancer

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Gastrointestinal Complications

Oral Complications

Gonadal Complications

Endocrine Complications

Secondary Cancers: Incidence, Risk Factors, and Management.

18) INFECTIONS IN PATIENTS WITH CANCER

Infections in Patients with Cancer

19) ONCOLOGIC EMERGENCIES

Oncologic Emergencies requiring medical management.

b. **CLINICAL RADIATION ONCOLOGY**

Radiotherapeutic Management of all the different malignancies

Radiotherapy for non-malignant conditions

Radiation Oncology Emergencies

Treatment Response & Result

Guidelines for treatment response assessment.

Complete Response, Partial Response, No response, Stable disease.

End points of treatment results. Loco-regional control recurrence, metastasis, survival quality of life.

Treatment related morbidity assessment

Radiation Toxicities (early & late)

Morbidities of combined treatment

Grading of morbidity

3. **CANCER CHEMOTHERAPY AND PHARMACOLOGY**

Basic Principles of chemotherapy

Chemotherapy drugs

Newer chemotherapeutic agents

Basic for designing different chemotherapy schedules. Standard chemotherapy schedules.

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Chemotherapy practice in various malignancies

Chemotherapy practice & results/toxicities in sequential & concomitant chemoradiotherapy.

Supportive care for chemotherapy.

The basic principles underlying the use of chemotherapeutic agents.

Classification and mode of action of cytotoxic drugs. The principles of cell kill by chemotherapeutic agents, drug resistance, phase specific and cycle specific action.

Drug administration. The general principles of pharmacokinetics; factors affecting drug concentration 'in vivo' including route and timing of administration, drug activation, plasma concentration, metabolism and clearance.

Principles of combinations of therapy, dose response curves, adjuvant and neo-adjuvant chemotherapy, sanctuary sites, high dose chemotherapy, and regional chemotherapy.

Toxicity of drugs. Early, intermediate and late genetic and somatic effects of common classes of anticancer drugs. Precautions in the safe handling of cytotoxic drugs.

Endocrine manipulation and biological response modifiers. An understanding of the mode of action and side effects of common hormonal preparations used in cancer therapy (including corticosteroids).

Use of the major biological response modifiers such as interferons, interleukins and growth factors and knowledge of their side effects.

Assessment of New Agents. Principles of phase I, II, and III studies.

Gene Therapy

4. OTHER DISCIPLINES ALLIED TO CLINICAL ONCOLOGY

Surgical Oncology

Basic principles of surgical oncology, biopsy, conservation surgery, radical surgery, palliative surgery.

Basics of surgical techniques – head & neck, breast, thorax, abdomen, gynecological, genitourinary, musculoskeletal, CNS.

Combined treatments: with radiotherapy, chemotherapy, and hormone therapy.

Diagnostic Radiology and Nuclear Medicine

Radiographic diagnosis of malignant and nonmalignant conditions

Radiological Procedures with reference to Radiotherapy practices

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Study of Ultrasound, CT Scans, MRI Scans, and PET scans, as applicable for management of cancer.

Other nuclear imaging and therapeutic modalities as applicable to management of cancer.

5. **PREVENTIVE &COMMUNITY ONCOLOGY**

Cancer Epidemiology & Etiology

Cancer Statistics- worldwide & India

Cancer Registries & National Cancer Control Programme

Analysis of data in cancer registries

Regional Cancer Centers

Cancer Screening & Prevention

6. **PALLIATIVE CARE**

Guidelines for palliative care

Symptoms of advanced cancer

Management of terminally ill patients.

Different pharmacologic & non-pharmacology methods

Pain control, WHO guidelines for adults & children

Palliative radiotherapy

Palliative chemotherapy

Home care

Hospice care

Physical, social, spiritual & other aspects

7. **TRAINING**

Residency in Clinical Oncology

Theory, clinical & practical modes of training

Structured training: lectures, seminar, Journal club, Ward-round, Physics demonstration,

Practical, Case Presentations (e.g. Long Case; short case)

Participation in various procedures, techniques (e.g. Brachytherapy, Radiotherapy Planning,

Mould Room Procedures etc.)

Administration of chemotherapy and supervision of day care ward.

CME-conference, symposium, workshop, seminar (including CME) Visiting other cancer centres & clinical oncology departments.

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8. **COMMUNICATION SKILLS**

The discipline of Clinical Oncology requires additional specialist communication skills which the trainee will acquire incrementally during the indicative three years of training and the trainee will be expected to demonstrate increasing capability as he/she gains experience and skills. It is anticipated that the trainee will undertake very few of these skills unsupervised during the first phases of training but by the time that he/she is ready to take the Final M.D examination, will have gained some experience in all domains and will have successfully negotiated the majority of situations at least once with minimal supervision.

9. **ADMINISTRATION**

Clinical Oncologists role as an administrator- How to set up a Radiotherapy and Oncology department, planning of infrastructure, & equipment. Role in National Cancer Control Programme (NCCP). Responsibilities towards safety & quality assurance

2.11 No: of hours per subject

Present in clause 2.10 .

2.12 Practical training

1st Year

Clinical Oncology (In-patient ward and special clinics)

Radiation Oncology

Medical Oncology

Molecular & Cancer Biology

Radiobiology

Radiation Physics

Pathology

Cancer Chemotherapy and Pharmacology

Diagnostic Radiology

Cancer Epidemiology and Medical Statistics

Cancer Research and Laboratory methods

2nd Year (In-patient ward and special clinics)

Clinical Oncology & Critical Care (In–patient ward & special clinics)

Radiation Physics

Simulators, Tele-therapy, Brachytherapy and other machine postings

Radiotherapy treatment planning

Medical Oncology including Hemato-oncology

Prescription and administration of cytotoxic chemotherapy

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Internal Medicine

Critical Care (ICU)

Specialty clinics (Nuclear medicine, Pain & Palliative, Paediatric Oncology, Surgical Oncology, ENT, Gynaecologic oncology)

3rd Year

Clinical Oncology & Critical Care including oncological emergencies (Inpatient ward and special clinics)

Medical Oncology

Radiation Oncology

Teaching Skill

Clinical audit

- clinical effectiveness
- clinical risk management including discrepancy review
- quality standards

Cancer Research

Health informatics

2.13 Records

Present in clause 2.21.

2.14 Dissertation:

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

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4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to within the first 6 months from the commencement of the course or as notified by the university in the calendar of events, to the Registrar.

Submission of dissertation

The dissertation shall be submitted to the Registrar (Evaluation) of the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be reevaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Present in clause 2.12.

2.16 Project work to be done if any

As stipulated by the Head of Department.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

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2.18 Prescribed/recommended textbooks for each subject

As stipulated by the Head of Department.

2.19 Reference Books

- Molecular Diagnosis of Cancer, COTTER.F.E.
- Molecular Biology for Oncologist, YARNOLD.J.R. et al
- Cancer Chemotherapy Handbook, BAQUIRANJ DELIA
- The Lymphomas, CANELLOS, G.P.et al
- Chemotherapy source book, PERRY, M.C,
- Leukemia, HENDERSON, E.S.et al
- Cancer Medicine, HOLLAND, J .F. et al.
- Atlas of clinical Haematology, BEGEMANN
- Text book of Malignant Haematology, Degos .L et al
- Clinical Haematology, ROCHARD Lee. et al
- Clinical Oncology, ABELOFF et al
- Important Advances in Oncology, .DEVITA, V.T.
- Cancer Principles and Practice of Oncology, DEVITA, V. T. et al,
- Decision Making in Oncology Evidence Based Management, DJULBEGOVIC. B & SULLIVAN.
- AJCC Cancer Staging Manual
- Cancer Treatment, HASKEL
- Oncology for' Palliative Medicine, HOSKIN PETER & MAKING WENDY)
- Regional Therapy of Advanced Cancer, RUBIN, J.T
- MAGRATH, I. The Non-Hodgkin's Lymphoma,
- Comprehensive Text book of Oncology, Vol 1-2, MOSSA, A.R
- Oxford textbook of Oncology PECKHAM, M. et al I
- A Multi-disciplinary Approach for Physicians and Students, RUBIN Clinical Oncology.
- Atlas of diagnostic oncology, SKARIN, A.T
- Basic Science of Oncology, TANNOCK,E.I
- Pediatric oncology, Philip LANSZOWSKY
- William’s Haematology [Beutler, Lichtman, Coller & Kipps]
- Wintrobe’s Clinical Haematology [Greer et al]
- Haematology – Basic Principles & Practice [Hoffman, Benz, Shattil, Furie, Cohen & Silberstein]

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- Practical Haematology [Dacie & Lewis]
- Bone Marrow Transplantation. [Forman, Blume & Thomas]
- Clinical bone marrow and blood stem cell transplantation [Atkinson et al]
- The molecular basis of Blood Diseases [Stamatoyannopoulos, Neinhuis, Leder & Majerus].
- Liebel and Philips text book of radiation oncology Richard T Hoppe, Theodore Locke Philips Mack Roach III
- Perez and Brady's Principles and Practice of Radiation Oncology Edward C Halperin, Carlos A Perez
- Clinical Radiation Oncology (2007) Leonard L Gunderson, Joel E Tepper.
- Bethesda Handbook of Clinical Oncology (2009) by Carmen J Allegra, Jame Abraham, James L Gulley
- Handbook of evidence based radiation Oncology 2nd Edition (2010) Dr. Eric K Hansen, Dr, Mack Roach III.
- Moss's Radiation Oncology: Rational, Technique, Results (1994) William Thomas Moss, and James Daniel Cox.
- Text Book of Radiotherapy, Gilbert H Fletcher.
- Treatment planning in Radiation Oncology 2nd Edition (2007) Faiz M Khan.
- Oxford Handbook of Oncology, Jim Cassidy, Donald Bissett, Roy A J Spence Obe.
- The Physics of Radiation Therapy: Mechanisms, Diagnosis and Management by Faiz M Khan.
- Radiobiology for the Radiologist 6th Edition, Eric J Hall.
- Text Book of Medical Oncology 4th edition, Franco Cavalli, Stan B Kaye, Heine H Hansen, James O Armitage, Martine J.
- Surgical Oncology: Contemporary principles and Practice, K. I. Bland, John M Daly, Constantine P Karakousis

2.20 JOURNALS

1. Acta Oncologica
2. Haematology/Oncology
3. British Journal of Cancer
4. Cancer
5. CA.A Cancer Journal for Clinicians

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6. Cancer Detection & Prevention
7. Cancer Genetics and Cytogenetics
8. Cancer Journal (Scientific American) (NP)
9. Cancer Survey (NP)
10. Cancer Treatment Review
11. Clinical Oncology
12. Current Problem in Cancer
13. Current Opinion in Oncology
14. European Journal of Cancer
15. European Journal of Surgical Oncology
16. Genes, Chromosomes and Cancer
17. Gynaecologic Oncology
18. Haematological Oncology
19. Haematology Oncology Clinics of North America
20. Indian Journal of Cancer (Indian)
21. International Journal of Cancer (UICC)
22. International Journal of Gynaecological Cancer
23. International Journal of Radiation Oncology Biology/Physics
24. Journal of Cancer Education (NP)
25. Journal of Clinical Oncology
26. Journal of National Cancer Institute (Gift) 27.Journal of Psycho social Oncology
27. Journal of Surgical Oncology
28. Medical & Paediatric Oncology
29. Nutrition and Cancer
30. Oncology (NP)
31. Psycho-Oncology
32. Radiotherapy & Oncology
33. Seminars in Oncology
34. Seminars in Oncology Nursing
35. Seminars in Radiation Oncology

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36. Seminars in Surgical Oncology

37. International Journal of Radiation Oncology, Biology, Physics.

38. Annals of Oncology

39. British Journal for Cancer

40. Journal of Cancer Research and therapeutics

41. Medscape Oncology

42. The Lancet

43. The new England Journal of Medicine

44. Surgical Oncology Clinics of North America

45. Blood

46. British J. Haematology

47. Seminars in Haematology

48. Haematology & Oncology Clinics

49. Bone Marrow Transplantation

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATION

3.1 Eligibility to appear for exams

- Minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

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Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that specialty.

3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each specialty. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

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Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Four (4) papers, Three (3) hours and hundred (100) marks each, and each consisting of one (1) essay and eight (8) structured short notes.

Paper I – Radiation Physics, Cancer Biology Including Radiobiology & Other Basic Sciences of Clinical Oncology

Paper II – Clinical Oncology - Principles & Practice of Radiotherapy

Paper III – Clinical Oncology - Principles & Practice of Cancer Chemotherapy & Other Systemic Therapies

Paper IV – Recent Developments in Clinical Oncology

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No.:……**

MD Degree Examinations in Radiotherapy

(Model Question Paper)

Paper I – Radiation Physics, Cancer Biology Including Radiobiology& Other Basic Sciences Of Clinical Oncology

Time: 3 hrs **Max marks:100**

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- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essays: **(2x25=50)**

1. Describe the shape of the cell survival curve for sparsely and densely ionizing radiations. Mention the various parameters used to describe the shape of the cell survival curve for sparsely ionizing radiations as described in the multi-target model.

Short essays: **(10x5=50)**

2. Reoxygenation
3. RBE
4. Population based cancer registry
5. Oncogenes
6. Pathology of Hodgkin's disease
7. Compton effect and its clinical significance
8. Beam directing devices
9. Californium as a brachytherapy source

****

QP Code: **Reg.No.:……**

MD Degree Examinations in Radiotherapy

(Model Question Paper)

Paper II – Clinical Oncology - Principles &Practice of Radiotherapy

Time: 3 hrs **Max marks:100**

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essays: **(2x25=50)**

1. Describe the pathology and staging of carcinoma cervix and discuss in detail the management of carcinoma cervix stage III B.

Short essays: **(10x5=50)**

2. Rationale of postoperative radiotherapy

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3. Management of brain metastases
4. Principles of palliative radiotherapy
5. Rationale of combining photon beam therapy and electron beam therapy
6. Concomitant boost
7. Radioprotectors
8. High dose rate brachytherapy
9. Avoidance of long term complications in clinical radiotherapy

****

QP Code: **Reg.No.:……**

MD Degree Examinations in Radiotherapy

(Model Question Paper)

Paper III – Clinical Oncology - Principles & Practice of Cancer Chemotherapy & Other Systemic Therapies

Time: 3 hrs **Max marks:100**

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essays: **(2x25=50)**

1. Discuss the different sequences in which chemotherapy is combined with other modalities of treatment.

Short essays: **(10x5=50)**

2. SVC syndrome
3. Medulloblastoma
4. Adriamycin
5. Perineal Implants

6. CHOP
7. Chemotherapy of Wilm's tumour
8. Hormone manipulation in carcinoma prostate
9. Bone marrow toxicity following chemotherapy

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QP Code: **Reg.No.:……**

MD Degree Examinations in Radiotherapy

(Model Question Paper)

Paper IV – Recent Developments in Clinical Oncology

Time: 3 hrs **Max marks:100**

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essays: **(2x25=50)**

1. **Discuss the recent advances in the management of early stage breast cancer with special emphasis on radiation techniques.**

Short essays: **(10x5=50)**

2. X-knife
3. Cone beam CT
4. Proton beam therapy
5. Targeted therapy
6. GTV, CTV and PTV
7. PET scan
8. PDR brachytherapy
9. DRR

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

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Practical examination consists of clinical case discussion, clinical skill assessment and viva voce for a total of four hundred (400) marks divided among each.

A. **Clinical Case Discussion** – two hundred (200) marks

One (1) long case – 45 minutes for case taking – hundred (100) marks

Two (2) to three (3) short cases – 30 minutes each for case taking – total hundred (100) marks

The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject.

Case selection for examination should be comprehensive and include all the different systems.

B. **Clinical Skill Assessment** – hundred (100) marks

a) **Objective Structured Clinical Examination (OSCE)** – five (5) stations – ten (10) marks each – three (3) to five (5) minutes each – which comprises of any of the followings:- pathological gross specimen, pathological microscopy, radiological films, contouring stations, dose volume histograms, radiotherapy equipment's, cancer chemotherapeutics agents, clinical examinations, charts, or any other areas relevant in clinical oncology.

b) **Clinical Case Scenarios** - five (5) stations – ten (10) marks each - five (5) to seven (7) minutes each – consisting of hypothetical or real clinical case scenarios given to the candidate to assess the comprehensive knowledge in cancer care, to test the in-depth knowledge in clinical oncology (medical and radiation oncology).

3.9 Number of examiners (Internal & External) and their qualifications
Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva:

Viva Voce – 80 marks
Log Book – 20 marks
Total - 100 marks

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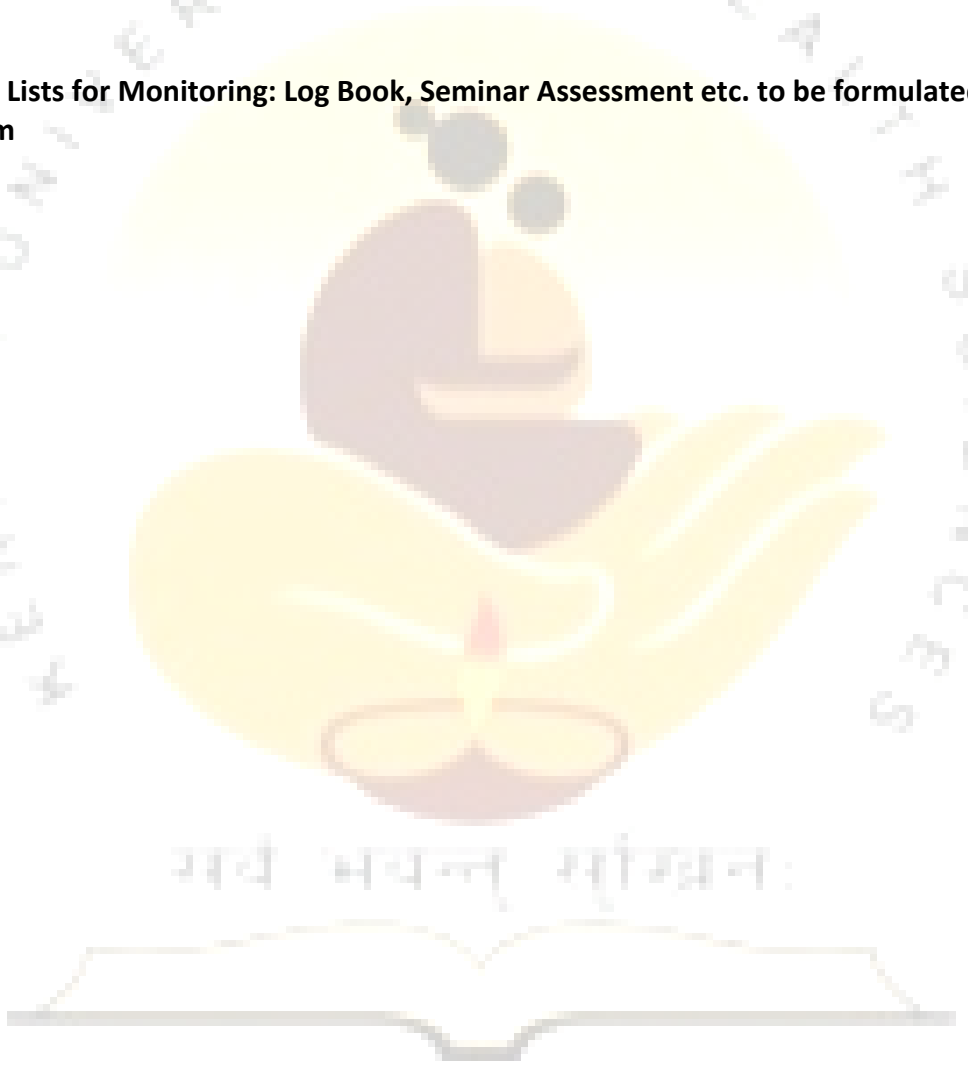
The Clinical Skill Assessment and Viva Voce in examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

4.. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum



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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD PULMONARY MEDICINE

Course Code 215

(2016-17 Academic year onwards)

2016

2. COURSE CONTENTS

2.1 Title of course:

M.D. Pulmonary Medicine

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.

- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As given under clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years. The maximum duration of the course will be 6 years.

2.6 Syllabus

As given under clause 2.10
The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

Not applicable as it is a residency programme.

2.8 Branches if any with definition

Not Applicable

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations. This is to improve the quality of training.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

2.10 Content of each subject in each year

Structure & Functions of Respiratory System, Cardiovascular system and mediastinum.

1- Anatomy
2- Development & aging of respiratory system
3- Physiology
4- Pathophysiology
5- Microbiology
6- Genetics
7- Pharmacology
8- Pathology
9- Immunology & defence mechanisms
10- Moleculay biology
11- Biochemistry

Airways

1-Asthma
2-Acute Bronchitis
3- COPD
4-Bronchiolitis
5-Bronchiectasis
6-Airway Stenosis, megaly & malacia

7-Tracheooesophageal Fistula
8-Upper airway disease
9-Vocal cord Dysfunction
10-FB aspiration
11-GERD

Thoracic Tumours

1-Lung cancer
2-Metastatic Pulmonary tumours
3-Mesothelioma
4-Metastatic & Other pleural tumours
5-Benign intrathoracic tumours
6-Mediastinal tumours
7-Chest wall tumours
8-Sarcoma
9-Lymphoma and related diseases.

Non TB Respiratory Infections

1- Upper Respiratory Infections
2- Lower respiratory infections
3- Community acquired pneumonia
4- Nosocomial pneumonia
5- Pneumonia in the immunocompromised host
6- Other pneumonias
7- Parapneumonic effusion & Empyema
8- Lung abscess
9- Fungal infections
10- Parasitic infections
11- Epidemic Viral infections

Tuberculosis

1-. Aetiopathogenesis
2. Diagnostic methods
3. Differential diagnosis
4. Management of pulmonary tuberculosis
5. Complications in tuberculosis
6. Tuberculosis in children
7. Geriatric tuberculosis
8. Pleural and pericardial effusion and empyema
9. Mycobacteria other than tuberculosis
10. Extra pulmonary tuberculosis
11. HIV and TB
12. Management of MDR and XDR tuberculosis
13.Tuberculosis affecting various systems-Pulmonory, Lymph node, GIT , Genito Urinary , Nuro, Skeltal, cutaneous,occular tuberculosis
14.Principles of antituberculous treatment
15.Pharmacology of antituberculos drugs, drug advers reaction and management

Pulmonary Vascular diseases

1- Pulmonary Embolism
2- Pulmonary edema
3- Primary Pulmonary Hypertension
4- Secondary Pulmonary Hypertension, Cor Pulmonale
5- Vasculitis and Diffuse pulmonary hemorrhage
6- Abnormal A-V communication
7- Hepatopulmonary Syndrome

Occupational and Environmental Diseases

1- Occupational Asthma
2- Reactive airway dysfunction syndrome
3- Pneumoconiosis and Asbestos related Disease
4- Hypersensitivity pneumonitis
5- Dust and Toxic gas inhalation disease
6- Indoor pollution related diseases
7- Outdoor pollution related disease
8- Smoking related disease
9- High altitude Disease
10- Diving related disease, Aviation and sports related pulmonary disorders.
11. Disability evaluation and compensation.

Diffuse Parenchymal (interstitial) Lung Diseases

1- Sarcoidosis
2- Idiopathic Interstitial pneumonias including Idiopathic Pulmonary Fibrosis (IPF) NSIP,COP, AIP, RB-ILD, DIP, LIP
3- Cryptogenic organizing Pneumonia of unknown etiology/ Bronchiolitis obliterans organizing Pneumonia (BOOP)
4- Interstitial lung diseases specific to Infancy

Latrogenic diseases

1- Drug induced lung diseases
2- Complications of invasive procedures
3- Radiation induced Disease

Acute Injury

1- Inhalation Lung Injury
2- Traumatic thoracic injury

Respiratory Failure

1- Acute Lung Injury and Acute Respiratory Distress Syndrome
2- Obstructive Lung disease
3- Neuromuscular Disease
4- Chest Wall Diseases
5- Other restrictive lung Diseases

Pleural Diseases

1- Pleurisy
2- Pleural Effusion
3- Chylothorax
4- Haemothorax
5- Fibrothorax
6- Pneumothorax

Diseases of the chest wall and respiratory muscles including the diaphragm

1- Chest wall deformities
2- Neuromuscular disorders
3- Phrenic Nerve Palsy
4- Diaphragmatic hernia

Mediastinal Diseases

1- Mediastinitis
2- Medistinal Fibrosis
3- Pneumomedistinum
4-Neoplasams -benign and malignant
5-Congenital disorders of mediastium

Pleuropulmonary manifestations of systemic/ Extrapulmonary disorders

1- Collagen vascular disease
2- Cardiac disease
3 - Abdominal disease
4- Haematological disease
5- Obesity
6- Hyperventilation syndrome

Genetic and Developmental Disorders

1- Cystic Fibrosis
2- Primary Ciliary Dyskinesia
3- Alpha-1 antitrypsin deficiency
4- Agenesis, Aplasia and Hypoplasia
5- Sequestration

Respiratory Diseases and Pregnancy

1- Asthma
2- Cystic fibrosis
3- Tuberculosis
4- Sarcoidosis
5- Restrictive Lung diseases
6- Pregnancy induced respiratory diseases

Allergic Diseases (IgE mediated)

1- Allergic rhinitis
2- Asthma
3- Allergic Bronchopulmonary aspergillosis
4- Anaphylaxis

Eosinophilic Diseases

1- Non-asthmatic eosinophilic bronchitis
2- Acute and chronic eosinophilic pneumonia
3- Hypereosinophilic syndrome
4- Churg-strauss syndrome
5- Tropical pulmonary eosinophilia
6-Drug induced
7-Simple pulmonary eosinophilia

Sleep related disorders

1- Obstructive sleep apnoea
2- Central sleep apnoea
3- Upper airway resistance syndrome
4- Obesity hypoventilation syndrome

Immunodeficiency disorders

1- Congenital immunodeficiency syndrome
2- Acquired immunodeficiency syndrome
3- HIV related diseases
4- Graft versus host diseases
5- Post-transplantation immunodeficiency

Orphan Lung diseases

1- Langerhans cell histiocytosis 2- Lymphangioleiomyomatosis
3- Pulmonary alveolar proteinosis
4- Amyloidosis
5-pleuro pulmonary fibro elastofis

Symptoms and Signs

1- Dyspnoea
2- Wheeze
3- Stridor
4- Hoarseness
5- Cough
6- Sputum production
7- Chest Pain
8- Haemptysis
9- Snoring
10- General symptoms of disease including fever, weight loss, oedema, Nocturia and day time somnolence
11- Abnormal findings on inspection including cyanosis, abnormal breathing patterns, finger clubbing, chest wall deformities, superior vena cava syndrome and Horners syndrome
12- Abnormal findings on palpation and percussion
13- Abnormal findings on auscultation

Pulmonary Function Testing

1- Static and Dynamic Lung Volumes- Interpretation and Performance
2- Body Plethysmography – Interpretation
3- Gas transfer- Interpretation
4- Blood gas assessment and Oximetry-Interpretation and Performance
5- Bronchial provocation testing- Interpretation and performance
6- Cardiopulmonary exercise testing- Interpretation and performance
7- Assessment of respiratory mechanics- Interpretation
8- Compliance measurements - Interpretation
9- Respiratory muscle assessment – Interpretation
10- Ventilation perfusion measurement – Interpretation
11- Shunt measurement – Interpretation
12- Sleep studies- Interpretation and performance
13- Measurement of regulation of ventilation- Interpretation

Other procedures

1- Blood test and serology relevant to Respiratory medicine
2- Analysis of exhaled breath components including NO,CO and breath condensate
3- Sputum induction
4- Sputum analysis
5- Tuberculin skin testing
6- Allergy skin testing

7- Thoracic ultrasound imaging
8- Thoracentesis
9- Closed needle pleural biopsy
10- Medical thoracoscopy
11- Flexible bronchoscopy
12- Transbronchial lung biopsy
13- Transbronchial needle aspiration
14- Endobronchial ultrasound
15- Bronchalveolar lavage
16- Bronchography
17- Rigid bronchoscopy
18- Interventional bronchoscopic technique including fluorescent bronchoscopy, brachytherapy, endobronchial radiotherapy, afterloading laser and electrocoagulation cryotherapy, Photodynamic therapy and airway stents.
19- Transthoracic needle aspiration & biopsy
20- Fine needle lymphnode aspiration for cytology
21- Right heart catheterization
22- Chest X-ray
23- Flouroscopy

Procedures performed collaboratively

1- Thoracic imaging (X-ray, CT, MRI)
2- Nuclear medicine techniques (Pulmonary and Bone scan PET)
3- Electrocardiogram
4- Echocardiography
5- Ultrasound
6- Transoesophageal ultrasound
7- Oesophageal pH monitoring
8- Cytology/Histology
9- Microbiology testing

Treatment modalities and prevention measures

1- Systemic and inhaled drug therapy
2- Chemotherapy
3- Other systemic antitumour therapy
4- Immunotherapy including de-/ hyposensitization
5- Oxygen therapy
6- Ventilatory support (Invasive/ Noninvasive/CPAP)
7- Cardiopulmonary resuscitation
8- Assessment for anaesthesia/Surgery
9- Bronchoscopy and Endobronchial therapies

10- Intercostal tube drainage
11- Pleurodesis
12- Home care
13- Palliative care
14- Pulmonary rehabilitation
15- Nutritional interventions
16- Surfactant therapy
17- Gene therapy
18- Principles of stem cell therapy
19- Smoking cessation
20- Vaccination and infection control
21- Other preventive measures

Core generic abilities

1- Communication including patient education and public awareness
2- Literature appraisal
3- Research
4- Teaching
5- Audit/ quality assurance of clinical practice
6- Multidisciplinary teamwork
7- Administration and management
8- Ethics

Competencies in the fields shared with other specialties

1- Intensive care
2- High dependency units

Knowledge of associated fields relevant to adult Respiratory medicine

1- Thoracic surgery
2- Radiotherapy
3- Paediatric respiratory medicine
4- Chest physiotherapy
5- Other relevant medical specialties
6. General Medicine(Diabetetes, hypertension , renal disorders and Hepatic disorders)

7. Basic cardiology

8. Basic Anaesthesia

Further areas relevant to respiratory medicine

1- Epidemiology
2- Statistics
3- Evidence based medicine
4- Quality of life measures
5- Psychological factors in the development of respiratory diseases
6- Psychological consequences of chronic respiratory diseases
7- Public health issues
8- Organization of Health care
9- Economics of health care
10- Compensation and legal issues

2.11 No: of hours per subject

Not applicable as it is a residency program.

2.12 Practical training

General Medicine : 1.5 Months

Cardiology : 1 Month
Thoracic Surgery : 2 weeks

MICU : 1 Month

Paediatrics : 3 weeks Anaesthesia : 15 days

Radiodiagnosis:2weeks
Radio therapy: 1 week

2.12 Records

As given under clause2. 10

2.13 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be

resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any :As given under clause 2.12

2.16 Project work to be done if any : As stipulated by the University from time to time.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Respiratory Diseases (I & II) - Crofton & Douglas
Pulmonary Diseases & Disorders - A. Fishman
Murray and Naidal's text book of respiratory medicine
Tuberculosis William N Rome,Stuart M Garay

2.19 Reference books

- Diseases of Chest (I,II,III &IV) - Fraser & Pare
- Principles of Critical Care - Farokh E. Udwadia
- Pulmonary Function Testing - Gregg L. Ruppel
- Bronchoscopy -Udaya B. S.Prakash
- Principles & Practices of Sleep Medicine - Kryger & Roth
- Clinical application of Blood Gases - Barry A.Shapiro
- Occupational Lung Disorders - Park & Park
- Paediatric Respiratory Illnesses- Ravindran Chetambath
- High Resolution CT of the Lung - W. Richard Webb
- Surgical Aspects of Tuberculosis - Gibbons
- Tuberculosis – Toman
- Text Book of Pulmonary & critical care medicine-SK Jindal

2.20 Journals

- Chest
- Pulmoun
- Thorax
- American Journal of Respiratory and Critical Care medicine
- Lung India
- European Journal of Respiratory Diseases.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/ State/Regional conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3. Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

M.D

- Theory 400 marks (M.D/M.S)
- Clinical / Practical 300 marks
- Oral 100 marks

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Practicals: Total 300 marks distributed between long case/ short case/ practicals depending on the speciality.

Division of marks

Practicals

Long case :150 Marks

Two short case : 50 Marks each

Ward rounds : 50 Marks

Oral: 100 marks for oral examination.

Division of marks

Viva voce : 80 marks

Log book : 20 Marks

Pass Criteria: 50 % Separate minimum for:

(1) Theory with 40% minimum for each paper
(2) Clinical / practical, and oral examinations.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Paper 1 – Basic Science Applied aspects of Anatomy, Physiology, Biochemistry, Pharmacology, Pathology, Pathophysiology and Radiology. (Marks 100)

Paper II –Pulmonary Tuberculosis and Extra Pulmonary Tuberculosis including Epidemiology and control programme (Marks 100)
Paper III- Non tuberculous Pulmonary Diseases (Marks 100)
Paper IV- Recent advances in Pulmonbary Medicine, Critical Care, Clinical Immunology and Air pollution (Marks 100)

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No.:……**

MD Degree Examinations in Pulmonary Medicine

Paper I – Applied aspects of Anatomy, Physiology, Biochemistry, Pathology, Pathophysiology, Microbiology& Radiology of TB & Chest diseases

Time: 3 hrs Max marks :100

- Answer all questions
- Draw diagrams wherever necessary

Essay: (20)

1. Discuss defense mechanism of lung.

Short essays: (8X10=80)

2. Lung compliance
3. Newer diagnostic tools for tuberculosis
4. O2 dissociation curve
5. Hyperluscent lung on chest_X-ray
6. Role of sputum examination in lung disorders
7. Role of eosinophyl in lung disease

8. Mechanism of granuloma formation in TB

9. Equal pressure point

****

QP Code: **Reg.No.:……**

MD Degree Examinations in Pulmonary Medicine

Paper II – Pulmonary Tuberculosis & Extrapulmonary tuberculosis including Epidemiology and Control Programme

Time: 3 hrs Max marks:100

 Answer all questions

 Draw diagrams wherever necessary

Essay: (20)

1. Discuss the evolution and diagnosis of MDR-TB. Describe DOTS plus in the context of XDR-TB

Short essays: (8X10=80)

2. Clinical manifestation of abdominal TB
3. Non tubercular mycobacteriosis
4. Broncho-pleural fistula
5. Hepatotoxic anti TB drugs
6. Lag period
7. Lymphnode TB
8. Appriasal of RNTCP
9. Post TB sequelae

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QP Code: **Reg.No.:……**

MD Degree Examinations in Pulmonary Medicine

Paper III – Non Tuberculous Respiratory diseases.

Time: 3 hrs Max marks:100

 Answer all questions

 Draw diagrams wherever necessary

Essay: (20)

1. Discuss the management of chronic persistent asthma

Short essays: (8X10=80)

2. Pathogenesis and diagnosis of silicosis
3. Preoperative pulmonary evaluation
4. Thoracoscopic lung volume reduction
5. Non specific interstitial pneumonia
6. Pulmonary infections in HIV patient
7. Newer antifungal agents
8. Wegeners granulomatosis
9. Obstructive sleep apnoea

****

QP Code: Reg.No.:……

MD Degree Examinations in Pulmonary Medicine

Paper IV – Recent Advances in Respiratory Diseases including Clinical Immunology & Air Pollution

Time: 3 hrs Max marks:100

 Answer all questions

 Draw diagrams wherever necessary

Essay: (20)

1. Discuss the diagnosis, management and prevention of ventilator associated pneumonia

Short essays: (8X10=80)

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2. Impact of air pollution on lung health
3. Assessing cost-effectiveness in medicine
4. Non-invasive ventilation
5. Newer phosphodiesterase inhibitors
6. Natural calamity and lung health
7. Assessing quality of life in COPD
8. Diagnosis of acute lung injury
9. Fraction of expired nitiric oxide (FENO)

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

Clinical / Practical and Oral

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have post graduate teaching experience of not less than 8 years as

Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva: division of marks

As given under clause 3.3

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MS OTO-RHINOLARYNGOLOGY

Course Code 216

(2016-17 Academic year onwards)

2016

2 . COURSE CONTENTS

2.1 Title of course:

M.S. OTO-RHINOLARYNGOLOGY

2.2 Objectives of course:

GENERAL GOALS

The goal of Post Graduate medical education shall be to produce competent specialists and/or Medical teachers

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advancements and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of medical and paramedical professionals.

  At the end of the Post Graduate training in the discipline concerned the student shall be able to

- Recognize the importance of the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.

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- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.

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- Function as an effective leader of a health team engaged in health care, research and training.

GOALS - Oto-rhinolaryngology:

The goal is to produce an Otolaryngologist, who should be able to

- Practice Otorhinolaryngology ethically maintaining human values.
- Diagnose and treat with reasonable skill, all common medical and surgical problems related to Otorhinolaryngology at all levels of health care including preventive and community health care without making serious complications, and refer the patient to a more experienced colleague when faced with a difficult situation
- Update his awareness of recent advances in Otorhinolaryngology
- Teach undergraduate medical and paramedical students in simple language, common problems in Otorhinolaryngology, especially about their signs and symptoms, diagnosis and general principles of therapy
- Know the basic principles of research methodology including record-keeping methods and basic statistics, and be able to conduct a research enquiry including making a proper analysis and writing a report on its findings.
- Communicate effectively with and counsel patients and their families, especially during an emergency in the casualty or dealing with a cancer patient or an accident victim or the community when the need arises

OBJECTIVES - Oto-rhinolaryngology:

After three years, the postgraduate should acquire the following:

1. **Cognitive skills:** Understanding of all basic sciences related to his specialty such as anatomy, embryology, physiology, pathology, clinical features, diagnostic procedures and therapeutics (medical/surgical) and preventive methods specifically pertaining to Otorhinolaryngology.

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2. **Clinical skills:** Diagnose conditions from history taking, clinical evaluation and investigations and develop expertise to manage commonly encountered, disorders and diseases both medically as well as surgically in different areas as follows:

   a. ***Otology, Neurotology & Skull-base Surgery***: Should acquire skill in early diagnosis of external, middle and internal ear diseases, deafness, facial nerve palsy, tinnitus, vertigo and tumors of the region and also acquire adequate knowledge about principles of therapy of these diseases.

   b. ***Rhinology:*** Should have knowledge of nose and paranasal sinus conditions such as infection, polyps and allergy. Should develop capability for oncologic diagnosis and treatment planning of such patients in collaboration with radiation and medical oncologists.

   c. ***Laryngology:*** Should be able to diagnose and manage infections and benign lesions of the larynx including voice-disorders. Should have basic knowledge of voice therapy and speech therapy. Should be capable of diagnosing laryngeal malignancies and plan treatment strategies in collaboration with radiation and medical oncologists.

   d. ***Pharyngology:*** Should acquire ability to diagnose and manage benign lesions of the nasopharynx, oropharynx and hypopharynx including adenoids, angiofibroma and reflux diseases. Should be conversant with common causes of dysphagia and have basic knowledge of swallowing therapy. Should be capable of diagnosing nasopharyngeal, oropharyngeal and hypopharyngeal malignancies and plan treatment strategies in consultation with radiation and medical oncologists.

   e. ***Oral cavity and salivary glands:*** Should learn about oral cavity and salivary gland diseases, their diagnosis and therapy planning with referral strategies for cancer patients to advanced cancer centers. Should be aware of common oral ulcers and pre-malignant conditions and counsel patients on prevention of oral malignancies.

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f. ***Head/Neck conditions/diseases:*** Should learn about head and neck diseases including benign and malignant thyroid diseases, malignant neck nodes, parapharyngeal tumors, neck space infections and their management.

g. ***Broncho-esophageal region:*** Should know about broncho-esophageal diseases/disorders such as congenital disorders, diagnosis of foreign bodies in wind/food pipes with their management policies. Should be capable of performing panendoscopy for oncologic evaluation in the head-neck region, including esophageal malignancy.

h. ***Plastic reconstruction following major head neck surgery & trauma:*** Should be aware of general principles of reconstructive surgery and its referral needs.

i. ***Advanced Surgical methods:*** Should acquire knowledge about phonosurgical procedures like thyroplasty micro/videolaryngoscopic surgery, palatopharyngoplasty for velopharyngeal incompetence and cleft palate and surgery for sleep apnea.

j. ***General principles of newer therapy/Surgery:*** Should acquire newer knowledge about ENT diseases in general, including technological advances (Laser, coblation, cryosurgery, robotic surgery, EXIT procedure), pharmacological advances (medicines) and newer method of therapy for certain conditions such as obstructive sleep apnea syndrome and asthma.

k. ***Traumatology & maxillo-facial injury:*** Should have knowledge in the management of trauma in general and maxillo-facial injury in particular, including nasal fractures.

l. ***Community and psychosocial:*** Should be capable of doing screening in the community of hearing & speech related disabilities, and also be capable of early identification of malignancies and create awareness in the community to eventually get better cooperation from people in health management. Elementary knowledge in clinical psychology and social work is to be acquired for management of patients, especially the terminally ill and differently abled persons and interacting with their relatives.

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m. ***Radiology in ENT:*** Should acquire knowledge about radiology and to interpret different radiological procedures and imaging results in Otolaryngology and Head and Neck and skull base regions. This includes plain X-rays, contrast X-rays, Ultrasound scans, CT scans, MRI scans and PET scans. There should be collaboration with Department of Radiology for such learning activities. Knowledge of interventional radiological techniques relevant to Otorhinolaryngology is also essential.

n. ***Audiology & Rehabilitation:*** Should be able to perform different audiological and neurotological tests for diagnosis of auditory and vestibular diseases and be capable of interpreting these findings and to implicate this in the diagnosis and treatment of the condition. He should also be aware of rehabilitative methods in audiology and speech pathology including hearing aids and other assistive and implantable devices and counsel patients accordingly.

o. ***Pediatric Otorhinolaryngology:*** Should have knowledge of diseases of ENT in children, including causes for respiratory distress and stridor at various ages, foreign bodies and surgery for hearing including cochlear implantation.

3. **Teaching:** Should acquire ability to teach undergraduates in simple language about the common ENT disorders especially about their signs and symptoms, diagnosis and general principles of therapy.
4. **Research:** Should develop capability for problem oriented record keeping with the use of computers and appropriate software. Should be able to conduct a research enquiry on such stored databases or clinical materials available in the hospital or the community. Should be able to do medical literature search from both online and conventional libraries, analyze data and discuss observations and conclusions vis-à-vis previous studies.
5. **Patient doctor relation:** Develop ability to communicate with the patient and his or her relatives pertaining to the disease condition, its severity, options available for the treatment and prognosis in the vernacular.

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6. **Preventive Aspect:** Should have sound knowledge about preventive Otorhinolaryngology. Should acquire knowledge about prevention of common conditions, especially in children such as middle ear and sinus infection, hereditary deafness and early diagnosis of head-neck malignancy.
7. **Identification of a special area within the subject:** Should develop higher skills further in specialized areas such as otology, neurotology, rhinology, laryngology, head and neck oncology, skull base surgery, sleep and snoring disorders and audiological medicine. Should show interest to pursue higher studies in one of the above areas or any other specialized area in the specialty, rather than limiting to general Otorhinolaryngology.
8. **Presentation of Seminar/paper:** Should develop public speaking ability and should be able to make presentation on disease-conditions and research topics to fellow colleagues in a seminar or meeting or conference using audiovisual aids.
9. **Writing and publishing research:** Should be capable of writing case-reports and research papers for publication in scientific journals.
10. **Team work:** Team spirit in patient **management**, working together in outpatient department, Operation Theater, and ward and sharing responsibility with colleagues such as doctor, nurses and other staff are essential. Resident has to develop these attributes through different mechanism of interaction.
11. **Practical training:**

    A junior resident, pursuing postgraduate degree in Otorhinolaryngology is expected to perform major and minor surgical procedures in the specialty independently as well as under supervision of a faculty member.

    On completion of the course, the resident should be able to do many major operations independently such as

    - Tracheostomy
    - Tonsillectomy
    - Adenoidectomy and grommet insertion
    - Nasal polypectomy

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- Excision of rhinosporidiosis
- Incision and drainage of quinsy and other abscesses
- SMR. & septoplasty
- Cortical mastoidectomy
- Modified radical mastoidectomy

He should be able to manage common emergencies like, fracture nasal bone, stridor requiring a tracheostomy, epistaxis, sub-periosteal abscess, and peritonsillar abscess.

He should be capable of doing minor operations independently like

- Myringotomy
- Myringoplasty
- Antral washout and nasal biopsy
- Sub-mandibular salivary gland removal
- Biopsy from a neck mass, such as a node
- Direct laryngoscopy
- Nasophayrngoscopy
- Aural polypectomy

He should be able to do the following operations under supervision/guidance of senior colleagues/faculty member

- Rigid endoscopy of esophagus
- Intranasal ethmoidectomy
- External ethmoidectomy
- External fronto-ethmoidectomy
- Maxillectomy (Partial and Total)
- Excision of thyroglossal cyst
- Superficial Parotidectomy
- Radical neck dissection for metastatic nodes
- Total Laryngectomy for cancer

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- Laryngofissure
- Repair of laryngotracheal trauma.
- Ligation external carotid artery

He should be able to do under guidance/supervision the following specialized operative procedures

- Facial nerve decompression
- Pinna-Repair (Post-traumatic)
- Surgery of choanal atresia
- External canal atresia-surgery
- Functional endoscopic/sinus surgery
- Stapedectomy
- Tympanoplasty with mastoid surgery
- Rhinoplasty for cosmetic purposes.
- Fibreoptic bronchoscopy and esophagoscopy including foreign body removal
- Cryosurgery/Laser surgery in ENT
- Micro/videolaryngoscopic voice-surgery for vocal nodules, polyps/ cyst etc
- Phonosurgery for cord palsy including type I thyroplasty.
- Skull base/parapharyngeal space surgery
- Thyroid surgery
- Laryngo-tracheal stenosis – surgical correction
- Maxillo-facial injury

(The above lists are only examples and not complete)

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline:

Total duration: 36 months

Basic training: 01 – 06 months

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Specialty posting: 07 – 12 months

Mandatory ENT training: 13 – 36 months

2.5 Duration:

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

Otorhinolaryngology including sub-specialties and recent advances thereto

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours:

Present in clause 2.10 .

2.8 Branches if any with definition:

The following sub-specialties are recognized and practised

Otology: Diseases of ear

Neurotology: Neurological diseases of ear including balance disorders

Rhinology: Diseases of nose and paranasal sinuses

Laryngology: Diseases of larynx including voice and reflex diseases

Head and neck surgery: Tumors of head and neck region

Skull base surgery: Lesions of anterior lateral and posterior skull base including tumors

Pediartic otolaryngology: Any ear, nose or throat issue in children including birth defects that affect breathing or eating, chronic illnesses, and other serious conditions

Sleep medicine: Disorders of sleep including people who are having difficulty falling or staying asleep

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Facial plastic: Botulinum injections to treat facial wrinkles, simple skin lesion removal, rhinoplasty, surgery for prominent ears, resection of malignancies and reconstruction of facial defects

2.9 Teaching learning methods:

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degree shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.
- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.
- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.
- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.
- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

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- The record books shall be checked and assessed by the faculty members imparting the training, monthly.
- During the training for Degree awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.
- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of interns Under Graduate medical students and paramedical students under supervision.
- **Seminars & Journal Review Meeting:**

  The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained.

- **Maintenance of Record of Work done:**

  1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.

  2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.

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3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

- **Periodical Assessment and Progress Report:**

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

- **Dissertation work:**

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

- **Registration of dissertation topic:**

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Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first six months of commencement of the course or as notified by the university in the calendar of events.

- **Submission of dissertation:**

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

SPECIFIC TEACHING LEARNING METHODS - ENT

Didactic lectures are of least importance; seminars, journal clubs, symposia, reviews and guest lectures should get priority for acquiring theoretical knowledge. Bedside teaching, grand rounds, interactive group discussions and clinical demonstrations should be the hallmark of clinical learning. The following learning methods are to be used for teaching of the postgraduate students:

1. ***Journal club:*** One hour duration - Paper presentation/discussion - once per week Seminar: One seminar every week of one hour duration
2. ***Lecture/discussion:*** Lectures on newer topics by faculty, in place of seminar as per need.
3. ***Guest lectures:*** These are to be arranged by the department involving consultants from Radiation oncology, Radiology, Plastic surgery, Neurosurgery, Maxillo-facial or other allied specialties
4. ***Case presentation:*** Done in the ward and the Special clinics (Vertigo Clinic, Otology Clinic, Rhinology Clinic, Headache clinic and Tumor Clinic) Resident will present a

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clinical case for discussion before a faculty and discussion made pertaining to its management and decision to be recorded in case files

5. ***Clinico-pathological Conference:*** Conducted in the Department of Pathology. Special emphasis is made on the surgical pathology and the radiological aspect of the case. The ENT junior resident presents the clinical aspects of the case and the Pathology resident presents the pathological aspects of the case. Various aspects including histopathology are discussed and future treatment protocols designed based on the report.
6. ***Combined Round/Grand Round:*** These are to be done for the hospital monthly involving presentation of unusual or difficult patients.
7. ***Community camps:*** For rural exposure and also for experiences in preventive aspect in rural situation, hospital or school. Patient care camps are to be arranged twice a year, involving residents and junior faculty. This is for community exposure and work experience
8. ***Emergency duties:*** Casualty duty to be arranged by rotation among the residents with a faculty cover daily by rotation
9. ***Specialty Clinics:***
    1. **Vertigo Clinic:** Once a week. All the patients with vertigo, attending ENT outpatient or referred cases are worked up in detail by the junior residents and are discussed with one or two faculty and treatment, decided upon.
    2. **Tumor clinic:** Once a week. In collaboration with the Department of Radiotherapy, the patients with cancer in the field of ENT and Head and Neck are worked up by the junior residents and their management discussed by the ENT as well as Radiotherapy consultants and treatment decision made.
    3. **Rhinology Clinic:** Once a week. Patients with nasal and sinus diseases and nasal deformity for rhinoplasty presented and discussed. Decisions for surgery, FESS, Rhinoplasty or only other treatment are taken.
    4. **Otology Clinic:** Once a week. The ear cases are thoroughly investigated and are discussed by the junior residents with the faculty for their management.

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Discussions are made after each case is presented. Audiologists are also part of this clinic.

5. **Headache clinic:** Once a week. Consultants from Neurology also attend. Help of Psychiatrists or Ophthalmologists may also be sought in cases in which their presence is deemed necessary. Cases are presented by residents, discussed and a decision on management is made
6. **Voice clinic:** Once a week. Patient with voice disorders are pooled and asked to attend the voice clinic. Specialized investigations like stroboscopy, voice analysis, electro-myography are performed and diagnosis is made. Treatment options are discussed with consultants and fixed. Speech and voice therapists are part of the clinic

10. ***Bedside clinical training:*** This is for training in patient care and bedside manners. Daily for half to one hour duration during ward rounds with faculty and one to two hours in the evening by senior resident or faculty on emergency duty. Discussions are to be made on bedside patient care. Once a week one senior faculty should take a one hour teaching round by rotation of Faculty
11. ***Audit and death review:*** Once a month the records of complicated cases and deaths are presented by senior residents. The junior residents are encouraged to participate actively in the discussion in the presence of faculty of Otorhinolaryngology and hospital administration. This program helps to take corrective measures as well as to maintain accountability in patient management.
12. ***Clinical teaching:*** In outpatient department, ward rounds, emergency, ICU and the operation theatres, residents and faculty on duty in respective places make discussion on clinical diagnosis, surgical procedures and treatment modalities, including post operative care and preparation of discharge slip.
13. ***Clinical interaction with audiologists/speech therapist:*** Clinical interaction with audiologist and speech therapist pertaining to management of patients with audiological and speech problems are made and discussion arranged. Audiologic methods and therapy strategies are to be made known to residents.

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14. ***Research Methodology:*** Should attend courses on research methodology and basic statistics. Should be taught the basic principles of research methodology including record-keeping methods, medical literature search using internet and conventional library. He should be able to conduct a research enquiry including making a proper analysis and writing a report on its findings. The final report may be published in indexed journals.

15. ***Teaching:*** Pedagogy is part of postgraduate training. Residents should chair seminars presented by undergraduates. They may also be allotted didactic lectures on turn by a roster in the department.

16. ***Humanities and Ethics:*** Courses and lectures are to be arranged for the residents for language proficiency by humanity teachers besides a few lectures on human values and ethical issues in patient care, personality development, behavior sciences, team spirit and human relationship including public relations. These are to be done by Psychologists, Sociologists and public relation officers and to be arranged by the department or college.

17. ***Writing Thesis:***

    a. The subject for thesis is to be selected by the resident in consultation with the guide and finalized after approval from other faculty and the head of the department. This may be done by presentation in the department and accepted after internal vetting

    b. A thesis protocol is to be made within first four months of admission and seek approval from scientific and ethical committees of the college concerned and the university

    c. The process should be completed never later than six months after admission

    d. Once the thesis protocol is approved the candidate starts the research work under direct supervision of guide and co-guides

    e. Guides and co-guides are to hear the problems of the candidate and can provide assistance to the student

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f. The thesis progress is presented in the department and discussed every three months to know the outcomes or difficulties faced by the resident.

g. Progress made or any failure of the candidate may be brought to the notice of college Dean or Principal

h. Thesis to be submitted six months prior to final exams. Final submission is made only after presentation to the entire department.

i. Once thesis is completed, the resident should be able to make an abstract, a short paper or a power point presentation of the same.

18. ***Cadaveric dissection Lab:*** Cadaveric temporal bone, Skull for nose & paranasal sinuses dissections and head & neck dissections must be arranged in the Departmental Lab and/or in the Department of Anatomy for learning surgical anatomy by dissection as well as for learning different operative procedures under faculty supervision and independently (for middle ear operations using operating microscope, endoscopic sinus surgery using endoscopes) during 2nd & 3rd year of residency on a regular basis before and during exposure of particular batch of students to real operative procedures in patients.

19. ***Conferences:*** The residents are encouraged to attend conferences and present papers. They are helped in preparation of presentations. Preliminary presentations are done in the department and flaws rectified by faculty before being finalized for presentation in a conference.

20. ***Logbook:*** Each candidate should be required to maintain a log book in which following details will be entered and evaluated on a scale of 1 to 10. At the end of each term of six months of training, for five such terms the logbook will be evaluated and a score is to be calculated from a maximum of 100 marks for the 10 items as entered in the logbook. Half of the total is considered in formative periodic assessment. The evaluation pattern is given below.

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Log book evaluation					
Heads of evaluation	**Term marks (Maximum)**				
	I	**II**	**III**	**IV**	**V**
Didactic lectures / guest lectures attended	10	10	10	10	10
Presentation in departmental seminars / journal clubs	10	10	10	10	10
Cases presented in clinical meetings	10	10	10	10	10
Intra and interdepartmental training and evaluation	10	10	10	10	10
Teaching activities / Community work	10	10	10	10	10
Skills learned independently, under supervision or assisted	10	10	10	10	10
Conferences / workshops / CME attended	10	10	10	10	10
Papers presented in conferences or published	10	10	10	10	10
Thesis progress and evaluation details	10	10	10	10	10
Attitude and punctuality	10	10	10	10	10
Total term marks	100	100	100	100	100
Marks to be added for periodic assessment	**50**	**50**	**50**	**50**	**50**

2.10 Content of each subject in each year

Paper I: Basic sciences

This includes

1. Anatomy

   a. Embryogenesis of ear, nose and throat including palate, mandible, teeth, lacrimal system, larynx, esophagus, trachea, lungs, tongue, salivary gland, head, neck, skull base etc.

   b. Applied anatomy of the skull bones, meninges, cranial venous sinuses, brain, external, middle and inner ears, nose, paranasal sinuses, lacrimal system, eustachian tubes, nasopharynx, oropharynx, hypopharynx, larynx, neck including

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fasciae and spaces, trachea and bronchi, lungs, pleurae, esophagus, and the mediastinum

c. Anatomy of all cranial nerves with their functions

d. Histology of mucous membranes

2. Physiology

a. Physics of sound, theories of hearing, mechanism of perception of sound

b. Physiology of hearing including neurophysiology, equilibrium, smell and taste, breathing, voice production, speech production, deglutition, salivation, lacrimation, larynx, tracheo-bronchial tree, esophagus, cough and sneezing

c. Physiology of brain in hearing, equilibrium, phonation, speech, smell and taste including pathways and central connections

d. Hearing evaluation and audiologic tests like pure tone audiometry, impedance, evoked potentials, otoacoustic emissions, speech audiometry including evaluation of children by behavior observation and play audiometry

e. Tests of smell and taste

f. Blood coagulation and hemostasis

g. CSF production and circulation

h. Lymphoepithelial system and mechanism of immune system.

3. Biochemistry

a. Chemistry of body fluids including CSF and their abnormalities

b. Liver function tests and their derangements

c. Renal function tests and their derangements

d. Hormones and their functions, thyroid function tests

4. Pharmacology of drugs used in ENT including

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Antibiotics, antiviral and antifungal drugs, anti-tuberculous drugs, antihistamines, analgesics and anti-inflammatory drugs, steroids including topical preparations, anesthetic drugs and drugs used for premedication, parasympathomimetic, sympathomimetic and their lytic drugs, anti-malignant drugs.

5. Microbiology

All bacteria pertaining to Otorhinolaryngology including tubercle bacillus and lepra bacillus viruses including retro virus, fungi, parasites, staining techniques, sepsis and aseptic measures, sterilization

6. Pathology

General pathology, wound healing, gross pathology and histopathology of common ENT diseases, preparation and staining of histopathology slides, biopsy and FNAC, cytology, hematology and immunology as applicable to otolaryngology

7. Principles of General Surgery including surgical diagnosis, basic necessities for surgery, management of shock, burns, aseptic technique, decontamination and debridement of wounds, incision, flap design, tissue handling, hemostasis, dead space management, intra-operative and post-operative fluid and electrolyte balance, blood transfusion, edema management, pain management, suture materials, suturing techniques, wound care, general health and nutrition of patient

8. Statistics: Basic statistics including methods of data collection, elimination of errors, analysis and interpretation of data

9. Allied subjects related to above (anesthesia, plastic surgery, maxillo-facial surgery, radiotherapy, surgical oncology, medicine, neurology and thoracic surgery)

10. Basic computers, computer averaging of the biological signals and its applications in Otorhinolaryngology and Otorhinolaryngologic equipments

11. Principles of jurisprudence and ethical issues as applicable to otolaryngologists

Paper II: Diseases of the Ear and Nose

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1. This includes history of otology and rhinology, doyens of otology and rhinology and clinical methodology as applied to ear and nose diseases in adult & children, diagnosis, medical and surgical treatment of diseases of ear and nose
2. Diseases of external ear including congenital anomalies and their correction, traumatic conditions, infections including otitis externa, otomycosis, skull base osteomyelitis, Herpes zoster, ear wax and keratosis obturans, foreign bodies, maggots
3. Tympanic membrane diseases including trauma, tympanosclerosis, myringitis, bullous myringitis
4. Infective middle ear diseases including acute otitis media, otitis media with effusion, chronic otitis media – mucosal and squamosal, their complications in detail and management
5. Conductive hearing including syndromial and non-syndromial losses, otosclerosis and stapedectomy
6. Sensorineural hearing loss including syndromial and non-syndromial losses, sudden sensorineural hearing loss, noise induced hearing loss, presbyacusis
7. Dizziness evaluation and its management including peripheral causes like Menière's disease, benign paroxysmal positional vertigo, vestibular neuronitis, central causes, phobic vertigo, motion sickness, whiplash injury
8. Disorders of eustachian tube including evaluation and treatment, patulous eustachian tube
9. Facial nerve disorders, upper motor neuron and lower motor neuron causes including Bell's palsy, traumatic palsy, syndromial associations, neuromas, clinical evaluation, topodiagnostic tests, grading of palsy, decompression of nerve, nerve grafting, facial slings and re-animation, intra-operative monitoring, eye care and physiotherapy for facial paralysis
10. Tinnitus evaluation and management, retraining therapy

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11. Conventional hearing aids, vibro-tactile aids and management of the hearing impaired including children including rehabilitation
12. Tumors of external and middle ear and their management, cerebello-pontine angle lesions and their management
13. Congenital anomalies of nose including choanal atresia, pyriform aperture stenosis, skull base defects with brain herniations and their management
14. Diseases of external nose including infections and their treatment
15. Infectious rhinosinusitis including viral, bacterial, complications of sinus infections including orbital, facial and intracranial ones, mucoceles, atrophic rhinitis, their diagnosis and management
16. Nasal allergy, non-allergic rhinitis, rhinitis medicamentosa, allergic fungal rhinosinusitis, eosinophilic mucinous rhinosinusitis
17. Maxillo-facial trauma with deformity of face including Le Fort fractures, fractures of nasal bones, zygoma, frontal bones, mandible and their management, CSF rhinorrhoea and its management
18. Epistaxis with causes, diagnosis and management
19. Nasal granulomas including tuberculosis, leprosy, syphilis, yaws, granulamatosis with polyangitis, nasal lymphomas, sarcoidosis, rhinoscleroma, rhinosporidiosis, Churg-Strauss syndrome, fungal infections both acute including rhino-cerebral mucormycosis and chronic ones
20. Nasal septal pathologies including deviated septum, hematoma, abscess, perforation,
21. Foreign bodies of nose, rhinolith, myiasis, synechiae nose,
22. Proptosis – causes, evaluation, diagnosis and management

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23. Jaw swellings including cysts in association with teeth, odontogenic tumors, fibrous dysplasia – monostotic and polyostotic, ossifying fibroma, cementoma, ameloblastoma, cherubism

24. Benign swellings of nose and paranasal sinuses, including nasal polyposis, squamous papilloma, inverted papilloma, hemangioma, osteomas.

25. Malignant tumors of the nose and paranasal sinuses including plasmacytoma, hemangiopericytoma and carcinomas with their pathology, staging, diagnosis, management including prosthetic and flap reconstruction, prognosis and prevention.

Paper III: Diseases of Throat, Skull Base & Head and Neck

1. Cleft lip and palate and their management

2. Oral mucosal lesions including leukoplakia, sub-mucous fibrosis and other pre-malignant lesions, bullous and ulcerative lesions like pemphigus, herpes, hand foot and mouth disease, herpangina, aphthous ulcers, pigmented lesions like melanosis, melanoma, tongue lesions including ankyloglossia, geographic tongue, hairy tongue, fissured tongue

3. Oral benign and malignant lesions, their etiology, pathology, clinical features, staging, diagnosis, management and prevention.

4. Salivary gland acute infections including abscesses, chronic infections, actinomycosis, toxoplasmosis, salivary calculi and chronic sialadenitis

5. Sjogren's syndrome, Frey's syndrome and tympanic neurectomy

6. Tumors of salivary glands. Benign including pleomorphic adenoma, Warthin's tumor, malignant tumors including all carcinomas, lymphoma. Pathology, staging, diagnosis, treatment

7. Neoplasms of oral cavity. Benign like papilloma, adenoma, pleomorphic adenoma, hemangioma, lymphangioma, torus, granulomas, cysts, ranula. Malignant lesions

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of oral cavity including carcinoma of each sub-site of oral cavity, etiology, staging, pathology, treatment, prognosis, prevention

8. Infections of pharynx including streptococcal tonsillitis and its complications, infectious mononucleosis, diphtheria, peritonsillar abscess and its complications, diseases of lingual tonsils, tonsillolith, keratosis pharyngis, stylalgia, Quinke's edema

9. Diseases of nasopharynx including adenoids, adenoid facies, craniofacial growth abnormalities and their correction

10. Sleep apnea evaluation and diagnosis, severity assessment, complications of sleep apnea, non-surgical and surgical treatment, treatment of snoring

11. Nasopharyngeal diseases including craniopharyngiomas, Thornwaldt cyst, teratomas, juvenile nasopharyngeal angiofibroma

12. Benign and malignant tumors of oropharynx including carcinomas, lymphomas, their etiology, pathology, investigations, staging, management and prevention

13. Parapharyngeal tumors – their pathology, diagnosis and management

14. Premalignant conditions of hypopharynx including sideropenic dysphagia, tumors of hypopharynx including carcinomas, their etiology, pathology, investigations, staging, non-surgical and surgical management including pull up operations and prevention

15. Congenital and neonatal stridor, causes including laryngomalacia, vocal cord paralysis, sub-glottic stenosis, laryngeal webs, sub-glottic hemangioma, laryngo-tracheal cleft and management

16. Adult causes of stridor, causes and management. Tracheostomy – its indications, types, tracheostomy tubes, procedure, complications, care after tracheostomy, decannulation, differences in adults and children, cricothyrotomy, per-cutaneous tracheostomy

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17. Infections of the larynx and throat including diphtheria, acute epiglottitis in children and adults, infections of tracheo-bronchial tree, chronic non-specific laryngitis, tuberculosis, lupus, syphilis, scleroma, leprosy, their causative organisms, diagnosis and management. Causes of laryngeal edema and management.

18. Indications and various techniques of direct laryngoscopy, bronchoscopy and esophagoscopy including micro-laryngoscopic procedures

19. Benign lesions of larynx including nodules, polypi, Reinke's edema, contact ulcers, intubation granuloma, leukoplakia and keratosis, amyloidosis, laryngeal cysts, laryngocoele, recurrent respiratory papillamatosis, solitary papilloma, hemangioma, chondroma, their pathology, investigations including stroboscopy, and management including voice therapy

20. Neurological lesions of larynx – vocal cord paralysis and its causes, classification, assessment, treatment including surgery, spasmodic dysphonia and its management

21. Malignant lesions of larynx including carcinoma, its etiology, pathology, staging, investigations, medical and surgical treatment including various types of laryngectomies, organ preservation protocol, photo-dynamic therapy, prognosis, prevention. Voice rehabilitation after laryngectomy

22. Diseases of esophagus including perforation, corrosive burns, Mallory-Weiss syndrome, gastro-esophageal reflux disease, Barrett's esophagus, benign strictures, hiatus hernia, Plummer-Vinson syndrome, Schatzki's ring, candidiasis, diffuse esophageal spasm, nut-cracker esophagus, achalasia cardia, scleroderma, Zenker's diverticulum, globus pharyngeus, benign tumors and malignancy esophagus with diagnostic procedures and treatment options

23. Foreign bodies of aero-digestive tract with diagnosis and management

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24. Thyroid and parathyroid diseases with their management. Benign and malignant tumors of thyroid and parathyroid swellings with diagnosis and treatment.
25. Neck node infections, unknown primary, their management
26. Neck abscesses including retropharyngeal, parapharyngeal, masticator space, Ludwig's angina, their management and complications

Paper IV: Recent Advances in Otorhinolaryngology

1. Recent developments in the diagnosis, pathogenesis and treatment of ENT diseases. Contact endoscopy, Optical coherence tomography
2. Frontiers of the otolaryngology and lateral skull base surgery.
3. Rhinoplasty, endoscopic sinus surgery, and anterior cranial fossa surgery
4. Lasers and fiber optics, coblation, robotics
5. Other methods of managing hearing loss including implantable hearing aids, cochlear implants, brain stem implants
6. Phonosurgery
7. Etiology and management of sleep apnea and snoring
8. Hypophysectomy and orbital and optic nerve decompressions
9. Immunotherapy and modalities of the gene therapy
10. Preventive Otorhinolaryngology
11. Radiology, imaging, computed tomography and magnetic resonance imaging, (MRI) and interventional radiology and angiography as related to Otorhinolaryngology
12. Newer techniques for radiotherapy including, use of gamma knife for treatment of intracranial tumors and other malignancy, 3D conformal radiotherapy including intensity modulated radiotherapy, image guided radiotherapy, stereotactic body radiation therapy.

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13. Chemotherapy of head and neck cancer including newer agents and their mechanism of action and complications

The above description is not all encompassing and topics of interest and importance may be added to the list as deemed necessary

2.11 No: of hours per subject

No specific hours assigned. As detailed in Clause 2.10.

2.12 Practical training given

The resident, after admission to the course is acclimatized to the activities of the department. He is given minor duties and responsibilities which include the following:

- Learns bedside history taking in ward, intensive care exposures, operation theater exposures, casualty exposure along with senior colleagues
- Exposed to Audiology, Vestibular Laboratory and speech therapy
- Cares for inpatients (preoperative and postoperative medical care only)
- Attends operation theatre and emergency operations for acclimatization.
- Assists ward rounds and visit other wards with senior colleagues to attend call or consultations from other departments
- Participates in the teaching sessions in ward bedside clinics and outpatient
- Attends all teaching activities of the department like seminars, case presentations, journal clubs and guest lectures to gain theoretical knowledge.
- Attends biostatistics classes and classes on research methodology.
- Makes a thesis protocol and report
- Attends lectures on humanity including personality development, behavior sciences, team spirit and ethical issues in patient care and human relationship including, public relations.

Months 07 – 12 (Specialty posting in various departments)

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During this period, the resident is rotated in various allied specialties so as to get exposed to various connected fields of Otorhinolaryngology. He is made aware of the fact that cooperation between different departments is essential for betterment of patient care. The following departments may be chosen

Anesthesia	4 weeks
General Surgery + ICU	4 weeks
Head & Neck surgery	4 weeks
Maxillo-facial surgery	4 weeks
Neurosurgery	2 weeks
Plastic surgery	4 weeks
Radiation Oncology	2 weeks

Months 13 – 36 (Mandatory ENT training)

The resident is rotated for an equal period of time in all units if more than one unit functions in the department. His duties are as follows:

- Attends ENT outpatient department at least two days a week
- Attends operation theatre at least two days a week
- Attends morning rounds at least two days a week
- Looks after minor operation theater in the outpatient area once a week by rotation, where minor procedures are performed
- Provides care of inpatients on allotted beds
- Discusses problematic cases with the consultants in outpatient and ward
- Does emergency duty at least once a week as per roster of the department
- Attends the weekly journal club and seminar and presents the same by rotation
- Start research (thesis) work at least from the start of second year of posting

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- Attends specialty clinics run by the department like Vertigo Clinic, Otology Clinic, Rhinology Clinic, Headache clinic and Tumor Clinic. Presents cases and participates in discussions including therapy planning etc.
- Attends combined teaching programs and clinical meetings of the hospital for staff and students of the whole hospital, especially departments of Surgery and Medicine
- Attends attend clinic-pathological conference (CPC) in the Department of Pathology
- Attends radiology clubs organized in collaboration with Department of Radiology
- Attends guest lectures by faculty from allied specialties
- Attends lectures by visiting faculty to the department or college from India or abroad
- Attends and presents papers in State/Zonal/National conferences
- Actively participates and helps in organization of departmental workshops or courses in specialized areas from time to time
- Attends rural camps or peripheral centers for community exposures and work experience
- Maintains a logbook of all academic activities and duly initialed by the supervising faculty and head of the department.

2.13 Records:

Log book as in Clause 2.21

2.14 Dissertation: As per Dissertation Regulation of KUHS

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

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Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any:

As detailed in Clause2. 12 above (7 – 12 months)

2.16 Project work to be done if any:

Thesis work: To be completed and submitted six months before final exam

2.17 Any other requirements [CME, Paper Publishing etc.]:

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination. This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

There is a huge amount of free Otorhinolaryngology resources on web that includes textbooks, journals and other resources. These are constantly updated and therefore providing a list of web resources is not feasible. Students can identify free resources on web by doing a Google search for “free otolaryngology resources”. It is also useful to search for otolaryngology surgery related videos in video sharing websites like YouTube. In addition to these, it is highly recommended that students develop a habit of searching the web for information related to Otorhinolaryngology.

2.19 Reference books:

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1. Scott-Brown's Otolaryngology, Head and Neck Surgery, 7th edition. Publishers: Edward Arnold Publishers Ltd., 2008
2. Cummings' Otolaryngology, Head and Neck Surgery, 5th edition. Publishers: Elsevier Mosby, 2010
3. Byron J. Bailey and Jonas T. Johnson, Head and Neck Surgery, Otolaryngology, 5th edition. Publishers: Lippincott Williams, 2016
4. Michael J Paparella - Otolaryngology, Head and Neck Surgery
5. Logan Turner's Diseases of the Ear, Nose and Throat, Robin Blair, Arnold G D Maran, 11th Edition; Publishers: Hodder Arnold, 2015
6. Ballenger's Otolaryngology, Head and Neck Surgery by James Snow and Ashley Wackym 18th edition. Publishers: PMPH, 2016
7. Surgery of the Ear - Glasscock- Shambaugh, 6th edition. Publishers: CBS Publishers, 2012
8. Manual of middle ear surgery: Approaches Myringoplasty, Ossiculoplasty and Tympanoplasty 2nd edition by Mirko Tos, Publishers: Thieme 2006
9. An atlas of Head and Neck Surgery 4th edition by Lore and Medina. Publishers: Elsevier Saunders, 2004
10. An atlas of Head and Neck Surgery by Jathin P Shah, Publishers: W.B. Saunders Co., 2006
11. Atlas of skull base surgery and Neurotology 2nd edition by Robert Jackler, Publishers: Thieme, 2008
12. Color Atlas on Temporal Bone Dissection by Vijayendra Honnurappa
13. Current Diagnosis and Treatment- Otolaryngology Head and Neck Surgery by Anil K. Lalwani. Tata McGraw Hill Publishing Company, New Delhi
14. European Manual of Medicine - Otolaryngology, Head and Neck Surgery by M. Anniko, M. Bernal Sprekelsen, V. Bonkowsky, P. Bradley, S. Iurato. Publishers: Springer (India) Private Ltd
15. Endoscopic Sinus Surgery - Anatomy, three dimensional Reconstruction and Surgical Technique by Peter John Wormald. Publishers: Thieme, 2013

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16. Endoscopic Sinus Surgery by Heinz Stamberger. Publishers: Mosby
17. Rhinology and Sinus Disease, A Problem Oriented Approach by Steven D Schaefer. Publishers: Mosby
18. Stell and Maran's Text book Head and Neck Surgery and Oncology 5th edition by J C Watkinson, Ralph W Gilbert. Publisher: CRC Press, 2012
19. Principles of Medical Statistics 12th edition by Austin Bradford Hill. Publisher: Hodder Education Publishers, 1991
20. Introduction to biostatistics and research methods 5th edition, by P S S Sundar Rao, J. Richard. Publisher, PHI Learning, 2012
21. Park's textbook of Social and Preventive Medicine 22nd edition by K Park. Publishers: M/s Banarsidas Bhanot, 2014
22. Gray's Anatomy - The Anatomical Basis of Clinical Practice, 41st edition, by Susan Standring. Publishers: Elsevier, 2015

2.20 Journals:

Indian

1. Indian Journal of Otolaryngology and Head Neck Surgery
2. Asian Journal of Ear Nose and Throat
3. Indian Journal of Otology

Foreign

1. Journal of Laryngology and Otology
2. Otolaryngologic Clinics of North America
3. International Journal of Pediatric Otolaryngology
4. Laryngoscope
5. Otolaryngology Head Neck Surgery
6. British Journal of Otolaryngology
7. North American Clinics of Otolaryngology
8. Annals of Otology, Rhinology and Laryngology
9. Acta Otolaryngologica
10. Archives of Otolaryngology, Head and Neck surgery
11. Journal of Paediatric Otolaryngology

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2.21 Logbook:

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATION

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years.

3.2 Schedule, ie, approximate months of Regular/Supplementary exams:

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The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks:

- ***Theory***

1. There shall be four theory papers.
2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that specialty.
3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- ***Clinical / Practical and Oral***

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

- ***Number of candidates***

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Periodic Formative assessment

The formative assessment should be continuous as well as end-of-term. The former should be based on the feedback from the unit faculty concerned. End-of-term assessment should be held

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at the end of each semester (up to the 5th semester). Formative assessment will not count towards pass or fail at the end of the program, but will provide feedback to the candidate. The marks are tabulated and maintained by the Head of the Department for assessment by the University or MCI (See Clause 11(vi) of General Regulations).

Scheme of periodic assessment:

It is held by means of a written test and clinical with viva examination by all consultants of the department as per distribution of marks as follows. The logbook is also evaluated and marks added to formative assessment. In such five six monthly tests a candidate shall be evaluated for 1000 marks in total i.e. 200 marks in each term as follows.

Periodic Formative Assessment						
Items	**Marks (maximum)**					
	Term I	**Term II**	**Term III**	**Term IV**	**Term V**	**Average**
Theory	75	75	75	75	75	75
Clinical and Oral	75	75	75	75	75	75
Log book	50	50	50	50	50	50
Total	200	200	200	200	200	**200**

Final summative Evaluation

Sl. No.	**Subject**	**Theory**		**Theory Group**		**Practical**				**Practical Group**		**Total**	
		University				**University**		**Viva**					
		Max	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**
1	Paper I	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

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3.5 Details of theory exams

Theory examinations will be conducted in the middle of sixth semester. There shall be four papers. Each paper shall be of three hours duration of 100 marks, distributed as per the contents of the question paper. Each paper includes one essay question (1×20 = 20 marks). The essay may be structured and marks distributed. Eight short essays (8×10 = 80 marks). Total theory marks are 4×100 = 400 marks

Paper I - Basic Sciences Applied to Otorhinolaryngology

Paper II – Diseases of ear and nose

Paper III: Diseases of Throat, Skull Base & Head and Neck

Paper IV: Recent Advances in Otorhinolaryngology

3.6 Model question paper for each subject with question paper pattern

MODEL QUESTION PAPER FOR MS OTORHINOLARYNGOLOGY

MS Degree Examinations in Otorhinolaryngology

Paper I - Basic Sciences Applied to Otorhinolaryngology

Time: 3 hrs **Max marks: 100**

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essay: **(20)**

1. Describe the anatomy and clinical significance of pterygopalatine fossa.

Short Essays: **(8x10=80)**

2. Cochlear microphonics
3. Methicillin resistant Staphylococcus aureus
4. Posaconazole
5. Physiology of smell
6. Otic ganglion
7. Inferior petrosal sinus
8. Intestinal adenocarcinoma of sinuses

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9. Total parenteral nutrition

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MODEL QUESTION PAPER FOR MS OTORHINOLARYNGOLOGY

MS Degree Examinations in Otorhinolaryngology

Paper II – Diseases of ear and nose

Time: 3 hrs **Max marks: 100**

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essay: **(20)**

1. Describe the etiopathogenesis clinical features and management of skull base osteomyelitis

Short Essays: **(8x10=80)**

2. Allergic fungal rhinosinusitis
3. Benign paroxysmal positional vertigo
4. Granulamatosis with polyangitis
5. Fibrous dysplasia
6. Vaccination protocol in cochlear implant
7. Orbital complications of sinusitis
8. Tympanosclerosis
9. CSF Rhinorrhoea

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MODEL QUESTION PAPERS FOR MS OTORHINOLARYNGOLOGY

MS Degree Examinations in Otorhinolaryngology

Paper III: Diseases of Throat, Skull Base & Head and Neck

Time: 3 hrs **Max marks: 100**

- *Answer all questions*
- *Draw diagrams wherever necessary*

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Essay: **(20)**

1. A 60 year old gentleman, a smoker of many years, presented to ENT OPD with swelling (L) side neck. He was asymptomatic otherwise. Examination showed a 4 x 3 cm hard mobile node in Level III. Ear nose and throat examination were normal. • How do you proceed to evaluate the case? • Discuss the treatment options. (10+10=20)

Short Essays: **(8x10=80)**

2. Management of obstructive sleep apnea

3. Masticator space infection
4. Craniopharyngioma
5. Spasmodic dysphonia
6. Tracheal stenosis
7. Cardio-vocal syndrome
8. Stomal recurrence
9. Gastric pull up

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MODEL QUESTION PAPER FOR MS OTORHINOLARYNGOLOGY

MS Degree Examinations in Otorhinolaryngology

Paper IV: Recent Advances in Otorhinolaryngology

Time: 3 hrs **Max marks: 100**

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essay: **(20)**

1. Discuss the surgical techniques and complications of cochlear implantation

Short Essays: **(8x10=80)**

2. CO_2 laser
3. Contact endoscopy
4. Robotic surgery in Otorhinolaryngology
5. Stroboscopy
6. Stacked ABR

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7. Image guided radiotherapy
8. Prevention of recurrent otitis media
9. Type IV Thyroplasty

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3.7 Internal assessment component:

Not applicable.

3.8 Details of practical/clinical exams

- .***Clinical / Practical and Oral***

1) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of three short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3) Marks of clinical exam:

Total practical marks 300 marks	
Long case	150 marks
Short cases (3×50)	150 marks

4) Duration of case taking:

1. Long case: 45 minutes for examination and preparation of case record

2. Short cases: 15 minutes each for examination and preparation of case record

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3.9 Number of examiners needed (Internal & External) and their qualifications:

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Total marks for viva:	**100**
Radiology (X-rays, CT & MRI scans)	20
Gross specimens, Histopathology & Microbiology	20
Audiometric charts, drugs, osteology	20
Instruments & Operative surgery	20
Log book (Clause 21)	20

Total marking pattern:

Theory	400 marks
Clinical	300 marks
Viva voce	100 marks
Total	**800 marks**

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4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MS GENERAL SURGERY

Course Code 217

(2016-17 Academic year onwards)

2016

2. COURSE CONTENTS

2.1 Title of course:

M.S. General Surgery

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.

- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.

- Who shall be aware of the contemporary advance and developments in the discipline concerned.

- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.

- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Present in clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

Present in clause 2.10

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

Not applicable as the course is a residency programme.

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

  - The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

  - Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco –

economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

Syllabus Theory

The syllabus for the postgraduate examinations in General surgery should fully integrate basic sciences and clinical knowledge- The syllabus should be common to all the Medical College, and may be conveniently divided into 10 modules- 5 core and 5 system modules. The core modules cover topics that relate to all branches of Surgery whereas the system modules cover the specialist components of basic surgical training. The syllabus is indicative of the areas of knowledge expected of candidates. It is not intended to be exhaustive or to exclude other items of knowledge which are similar relevance.

General Cognitive Skills

Core Module I- Peri- operative management (part I)

Pre-Op management

Assessment of fitness for anaesthesia and surgery

Tests of respiratory, cardiac and renal function

Management of associated medical conditions, eg diabetes, respiratory disease; cardiovascular disease: psychiatric disease: malnutrition: anaemia; drug therapy like steroids, anticoagulants and immunosuppressants.

Infection

Pathophysiology of the body's response to infection

The source of surgical infection- prevention and control

Surgically important micro organisms

Principles of asepsis and antisepsis

Surgical sepsis and its prevention

Aseptic techniques

Skin preparation

Antibiotic prophylaxis

Sterilisation

Investigative and Operative procedures

Excision of cysts and benign tumors of skin and subcutaneous tissue

Principles of techniques of biopsy

Suture and ligature materials

Drainage of superficial abscesses

Basic principles of anastomosis

Anaesthesia

Principles of Anaesthesia

Pre medication and sedation

Local and regional anaesthesia

Care and monitoring of the anaesthestised patient

Theatre- Problems

Surgical technique and technology

Diathermy, Principles and precautions

Explosion hazards in anesthesia and endoscopic surgery

Tourniquets uses and precautions

Prevention of nerve and other injuries in the anaesthetized patient

Surgery and special precautions in hepatitis and HIV carriers

Disorders of coagulation and haemostatsis and prophylaxis of DVT

Core Module2- Peri operative Management (part 2)

Skin and wounds

Pathophysiology of wound healing

Classification of surgical wounds

Principles of wound management

Incision and their closure

Suture and ligature materials

Scars and contractures

Wound dehiscence

Dressings

Fluid Balance

Assessment and maintenance of fluid and electrolyte balance

Techniques of venous access

Nutritional support and TPN, indications and techniques

Blood

Blood transfusion, indications, hazards complications and plasma substitutes

Post OP Complications

Prevention, monitoring, recognition and management of complications

Ventilatory support, indications and technique

Post OP Sequelae

Pain control

Immune response to trauma, infection and tissue transplantation

Pathophysiology of the body's response to trauma

Surgery in the immunocompromised patient

Core Module 3- Trauma

Initial Assessment and Resuscitation

Clinical assessment of the injured patient

Maintenance of airway and ventilation

Haemorrhage and shock

Chest , Abdomen and Pelvis

Cardiorespiratory physiology as applied to trauma

Penetrating chest injuries and pneumothorax

Rib fractures and flail chest

Abdominal and pelvic injuries

CNS Trauma

CNS anatomy and physiology relevant to clinical examination

Understanding of disorders caused by cranial or spinal trauma

Interpretation of special investigations

Intracranial haemorrhage

Head injuries, general principles of management

Surgical aspects of meningitis

Spinal cord injury and compression

Paraplegia and quadriplegia, principles of management

Special problems

Pre hospital care

Triage

Trauma scoring systems

Traumatic wounds, principles of management

Gunshots and blast wounds

Skin loss, grafts and flaps

Burns

Facial and orbital injuries

Limb injury

Anatomy and physiology of the peripheral nervous system

Pathophysiology of fracture healing

Non union, delayed union and complications of fractures

Principles of bone grafting

Traumatic oedema, compartment and crush syndromes and fat embolism

Brachial plexus injury

Core-Module- 4 Intensive Care

Cardiovascular

Surgical anatomy of airways, chest wall, diaphragm and thoracic viscera

Mechanisms and control respiration

Interpretation of special investigations, radiology, LFT and ABG

Disorders of respiratory function caused by trauma, acute surgical illness and surgical intervention

Respiratory failure

Complications of thoracic operations

Adult respiratory distress syndrome

Endotracheal intubation, cricothyroidotomy, tracheostomy

Artificial ventilation

Multi system failure

Pathology of multisystem failure

Renal failure, diagnosis and complications

GI tract and liver

Nutrition

Problems in the ICU

Sepsis, predisposing factors and organisms

Complications of thoracic operations

Localised sepsis, pneumonia, lung abcess, bronchiectasis, empyema and mediastinitis

Principles of ICU

Indications for admission

Organization and staffing

Scoring systems

Costs

Core Module 5- Neoplasia and general considerations

Principles of Oncology

Epidemiology of neoplasms and role of cancer registries

Principles of carcinogenesis and pathogenesis relevant to clinical feature, special investigations staging and treatment.

Clinico pathological staging of cancer

Pathology, clinical features, diagnosis and principles of management of common cancers in each surgical specialty

Principles of treatment by surgery, chemotherapy, immunotherapy and hormone therapy

Principles of molecular biology, genetic factors and mechanisms of metastasis

Cancer screening

Screening programmes for various cancers especially of the breast.

Economic and social aspects in screening

Special cancer clinics and multidisciplinary approach

Techniques in management

Terminal care of cancer patients and pain relief

Rehabilitation

Psychological effects of surgery and bereavement

Ethics and the law

Medical /legal ethics and medico legal aspects of cancer surgery

Communication with patients, relatives and colleagues

Outcome of surgery

Decision making in surgery

Evaluation of surgical outcome

Clinical audit & Principles of research and design and analysis of clinical trials

Critical evaluation of technical and pharmaceutical innovations

Health service management and economic aspects of surgical care

Statistics and computing in surgery

Systemwise Cognitive Skills

System Module I - Locomotor system

Msuculoskeletal anatomy and physiology relevant to clinical examination of the locomotor system and to the understanding of disordered function, with emphasis on effects of acute muculoskeletal trauma.

Effects of trauma and lower limb

Acute trauma

Common fractures and joint injuries

Degenerative and rheumatoid arthritis and principles of joint replacement & common foot disorders

Amputations

Infections and upper limb

Common soft tissue injuries

Infections of bones and joints including implants and prosthesis

Pain in the neck, shoulder and arm

Common hand disorders, injuries and infections

Bone disease and the spine

Common disorders of infancy and childhood including tumors

Low back pain and sciatica

Metabolic bone diseases

Surgical aspects of paralytic disorders and nerve injuries

Common disorders of adults including tuberculosis

System Module 2- Vascular System

Surgical anatomy and applied physiology of blood vessels relevant to clinical examination the interpretation of special investigations and the understanding of the role of surgery in the management of cardiovascular disease.

Arterial diseases

Chronic obliterative arterial disease

Carotid disease

Aneurysms

Special investigation techniques in vascular disease

Acute and chronic limb ischaemia and gangrene

General principles of management and reconstructive arterial surgery

Venous diseases

Vascular trauma and peripheral veins

Varicose veins and other disorders of veins in the lower limb

Venous hypertension and post phlebitic leg

Deep venous thrombosis and embolism and their complications

Chronic ulceration of the leg

Lymphatics and spleen

Anatomy and physiology of the haemopoietic and lymphoreticular systems'

Lymph nodes and lymphoedema

Surgical aspects of auto immune disease

Surgical aspects of disorders haemopoiesis

Spleen, Hyperplenism and splenectomy

System Module 3- Head, Neck and Endocrine

The head

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Laryngeal disease and maintenance of airway

Acute and chronic inflammation of ENT

Intracranial complications of ENT infections

Foreign bodies in ENT and epitasis

Salivary gland disease

Eye trauma and common infections

Neck and endocrine

Developmental anatomy and common neck swellings

Surgical anatomy and physiology of endocrine glands relevant to clinical examination, interpretation of special investigations, understanding of disordered function and principles and surgical management

Thyroid gland

Common disorders of parathyroids, adrenals and pituitary

System module 4- Abdomen and Genitourinary

Surgical anatomy of the abdomen and its viscera and the applied physiology of the alimentary and genitor urinary systems relevant to clinical examination, interpretation of common special investigations and understanding of disorders of function, disease and injury.

Abdominal wall

Anatomy of anterior abdominal wall, incisions and laparoscopic access

Anatomy of the groin and acute and elective hernias

Acute abdomen

Common acute abdominal emergencies

Peritonitis and intra abdominal abscess

Paralytic ileus and intestinal obstruction

Fistulas and their management

Investigation of abdominal pain and masses

Gynaecological causes of acute abdomen.

Abdominal trauma

Elective abdominal conditions

Jaundice

Portal hypertension

Gallstones

Pancreatic diseases

Stoma techniques and care

Common anal and perianal disorders

Urinary tract

Urinary tract in infections

Trauma to the urinary tract and haematuria

Urinary calculi

Diseases of prostate and retention of urine

Acute conditions of the scrotum

Renal failure and transplantation

Renal failure and dialysis

Principles of transplantation

System Module-5 Miscellaneous

Paediatric disorders

Neonatal physiology

Problems of anaesthesia and surgery in the new born

Principles of neonatal fluid and electrolyte balance

Correctable congenital abnormalities

Common paediatric surgical disorders

Recent Advances

Detailed Syllabus

1. Historical aspects of surgery

Origin of surgery

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Ancient surgical practice

Development surgery and allied specialties

Important social events influenced the development of surgery

Development of modern surgical practice

Contributions of various individuals in development

History of Indian surgery

2. Principles of surgery in general

1. Principles of clinical surgery
2. Principles of pre operative management
3. Intra operative care
4. Principles of post operative care
5. Surgical sepsis, prevention and management
6. Infectious and infestations of surgical importance
7. Principles of nutrition in surgical practice, nutrition in surgical patients and rehabilitation
8. Metabolism in surgical patients
9. Clinical immunology and organ transplantation
10. Surgical technique and principles of operative surgery
11. Surgical technology
12. Trauma management
13. Intensive care and management of critical illness
14. Principles of diagnostic and therapeutic radiology
15. Principles of clinical oncology
16. Principles of pathology in surgical practice
17. Pharmacology in surgical practice
18. Principles of genetics and genetic aspects of surgery

Topics in Detail

1. **Principles of clinical surgery**

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Case taking- History, physical examination, Demonstration of physical signs

Clinical assessment of surgical conditions

2. **Principles of Preoperative management**

Investigations in surgical practice- Scientific principles, Methodology of investigation of surgical case.

Assessment of fitness for surgery and anesthesia. Tests of respiratory cardiac and renal function Patho- physiology of respiratory , cardiovascular and renal systems.

Management of associated medical conditions with a knowledge of pathophysiology

diabetes mellitus respiratory disease, cardiovascular disease, bleeding disorders, seizure disorders, neurological diseases, malnutrition, anemia, jaundice, steroid, anticoagulant, immune- suppressant and other drugs therapy and drug therapy and drug therapy and management of psychiatric disorders.

Pre medication and sedation

Prophylaxis prevention and risk factors of thromboembolism

3. Intra operative care

Principles of anaesthesia

Care and monitoring of anaesthesia patient

Recovery from anaesthesia, recovery room

4. Principles of post operative care

Post operative management

Post operative monitoring

High dependency unit, intensive care unit

Assessment and maintenance of fluid and electrolyte blance

Care of tubes, drains and dressings

Pathophysiology, prevention, prevention, recognition and management of postoperative complications. Respiratory infections, atelectasis and failure, deep vein thrombosis, pulmonary, embolism, myocardial infarction, cardia failure and cardiac arrest, haemorrhage, fluid and electrolyte imbalance, shock, retention of urine renal failure, paralytic ileus, constipation, jaundice, sepsis, wound complications hematoma, infection, dehiscence, cerebral complications and psychiatric disorders.

Blood transfusion indications, hazards, complications, plasma substitutes, blood component therapy.

Techniques of venous access

Nutrition in postoperative patients

Post operative drug therapy

5. Surgical sepsis, prevention and management

Surgical infection- wound infection

Surgically important micro organisms

Principles of microbiology of body's response to infection, SIRS, sepsis, severe, sepsis, septic shock.

Sources of surgical infection- prevention, control, investigation and treatment of surgical infections.

Principles of asepsis and antisepsis

Aseptic techniques, cross infection, sterilization, disinfection

Antibiotic prophylaxis

Principles of antibiotic, therapy, antibiotics in surgery

6. Infections and infestations of surgical importance

Bacterial- Clostridial- tetanus, gas gangrene

Salmonella

Mycobacteria- tuberculosis, leprosy

Treponema- syphilis

Actinomycosts

Anthax

Chancroid, gonorrhea, LGV, granuloma inguinale

Viral- Herpes simplex infections

Cytomegalovirus infection

Viral hepalitis- A,B,C,D,E

HIV infection- AIDS

AIDS and surgical practice

Fungal candida, Aspergillus, Mycetoma

Parasitic- Hydatid disease, filariasis, amoebiasis, malaria ascariasis

7. Principles of nutrition in surgical practice, nutrition in surgical patients and rehabilitiation

Nutrition assessment in surgical practice including pre operative and post operative malnutrition.

Nutritional requirement

Indication of nutritional support

Routes of administration- techniques, indications, management, complication, Nutritional

Monitoring

Total parenteral nutrition

Principles of rehabilitation and physiotherapy, methods of limiting morbidity.

8. Metabolism in surgical patients

Metabolism of protein and carbohydrate

Protein requirements and turnover

Respiratory quotient

Energy- caloric requirements

Caloric- Nitrogen ratio, Role of fat as caloric source, Regulatory mechanism metabolic response to trauma, surgery, sepsis and starvation.

9. Clinical immunology & Organ transplantation

Immune system- components,function

Immune response

Major histocompatibility complex (MHC)

Immune suppression, immune suppressive drugs, problems with immune suppression

Transplantation

Immunology

Organ donation, preservation

Tissue typing

Technical aspects of transplantation of kidney, heart pancreas, lung, liver, heart lung and intestine

Ethical aspects of organ transplantation

Indian Law of Organ Transplantation

10. Surgical technique and principles of operative surgery

Skin preparation

Local anaesthesia-techniques

Incision, placement and techniques of closure

Suture & ligature materials

Suture techniques, anastamosis, tissue handling

Dressings

Tubes and drains, Catheters Cannulae

Methods of hemostasis

Principles of wound Management

Classification of surgical wounds

Pathophysiology of wound heating

Scars &Contracture, wound dehiscence

Excision of cysts and benign tumors of skin & subcutaneous tissue

Drainage of abscess

Growing, Masks, Scrubbing up, Gloves

Customs and conduct in operative theatre (Basic surgical skills training mandatory)

11. Technology in surgical practice

Diathermy principles. Usage, precautions

Lasers in surgical practice-principles, usage, precautions

Ultrasonic's in surgical practice

Endoscopic in surgical practice

Endoscopes, thoracoscope, laparoscope scientific operation complications

Instruments for operative surgery

Operating for operative surgery

Operating microscopes

Monitors in surgical practice

Ventilators

Properties of various implant materials

Operation theatre technology

Technology of illumination (lighting) in surgical practice

Computers in surgical practice

Robots in surgical practice

Internet and surgeon

Tele surgery

Applications of principles of information technology in surgical practice

12. Trauma management

Applied basic sciences relevant to the assessment of injured patients and to the understanding of

Disorders of function caused by trauma hemorrhage and shock

Epidemiology of trauma in-India

Mechanisms of trauma-blunt, sharp & Blast injury.

Metabolic response to trauma

Principles of pre- hospital are. First and ambulance service emergency management team, transport of trauma patients

Clinical assessment and management of trauma victim

Priority decisions in trauma management

Resuscitation –airway breathing & circulation management

Monitoring & repeated clinical assessment

Management of airway

Management of hemorrhage and shock

Management of traumatic wounds

Traumas scoring systems

Burns

Management of skin loss

Management of fractures, pathophysiology of fracture healing, immobilization of fracture treatment

Chest injuries, management of cardiac lemonade

Abdominal trauma

Head &spinal trauma

Pelvic injuries. Perineal, rectal and vaginal injuries and maxillofacial injuries

Traumatic edema and compartment syndrome

13. Intensive care and management of critical illness

Intensive care-principles& practice

Intensive care unit-structure &function

Indication of admission to ICU

Clinical assessment of critically ill

Scoring systems

Monitoring in ICU

Transportation of the critically ill patients

Applied cardiovascular and respiratory physiology. And assessment

Pathophysiology of shock &management

Respiratory and cardiovascular support ,

Cardiopulmonary resuscitation

Acute renal failure, dialysis

Hepatic failure-assessment and management

Selective decontamination of gut

Alimentary system management

Nutrition. Fluids & electrolyte management. In critically ill

Prevention of stress ulceration

Psychological & behavioral problems in ICU patients

Management of unconscious patient

Multiple organ dysfunction syndrome

14. Principles of diagnostic & therapeutic radiology

Imaging methods and principles of functioning-plain radiography contrast radiography ultrasound, CT scan, MR imaging scintigraphy etc.

Imaging of body systems

Interventional radiology-importance in surgical context- binary vascular, renal etc.

15. Principles of clinical oncology

Molecular biology of cancer

Carcinogenesis

Molecular basis of carcinogenesis tumor kinetic

Genetics & cancer

Pathological classification of tumors- in general

Staging of cancers

Mechanisms of metastasis

Premalignant conditions

Epidemiology of common cancers, cancer registers

Diagnostic modalities

Cancer screening. Tumor markers

Clinical problems associated with cancer

Treatment modalities in general surgery chemotherapy, radiotherapy, hormonal therapy immunotherapy

Terminal care of cancer patients psychological factors, pain relief

16. Principles of pathology in surgical practice

Biopsy techniques & cytological examination

Excision biopsy, incision biopsy, FNAC brush cytology, endoscopic biopsy

Basics of handling of specimen

Tissue processing, cutting & staining

Frozen section biopsy

Enzyme histochemistry

Immunohistochemistry

Election microscopy

17. Pharmacology in surgical practice

Principles related to drug action

Half life, bioavailability , volume of distribution, clearances, drug interaction advice drug reactions

Drug therapy in surgical practice-anticoagulants, diuretics inatropics, drugs, steroids, analgesics

Drug therapy in of diabetes mellitus, hypertension and bronchospasm

Drug therapy in young and old age

Drug usage in pregnancy

Drug usage in diseased states-renal failure, liver disease cardiac failure

18. Principles of genetics & genetic aspects of surgical practice

Fundamentals of genetics- chromosomes, genes, genetic code. Structure of DNA mutations.

inheritance, polymerase chain reaction gene mapping.

Applied genetics in diagnosis and management pedigree analysis, prenatal diagnoses, common genetic diseases encumbered in surgical practice. Screening consideration counselling.

Applied genetics in cancer management cellular biology of cancer tumor viruses, ontogenesis tumour suppressor genes. Genetic basis of carcinogenesis. Familial cancers, genetic basis of familial cancers, screening of familial cancers.

Gene therapy

3. General Principles in Surgical Practice

Decision making in surgical practice

Principles of good surgical practice

Consent for surgical treatment informed consent unconscious patient, consent for children, mental handicap and psychiatric illness. Informed consent and surgical research – Nuremburg code.

Surgical Audit

Economic aspects in surgical practice

Principles of management in surgical care delivery

Principle of management in surgical care delivery

Principle of referral practice in surgery

Medical documentation & information systems

Quality assurance in surgical practice

Principles of research and design & analysis of clinical trials

Quality of Life assessment – part of surgical research

Critical evaluation – literature and innovations

Medicolegal aspects in surgical practice

Ethical aspects in surgical practice

Communication with patients, relative and colleagues

Decision, certification and declaration of death

Decision on brain death

Psychological effects of Surgery and bereavement

Civil responsibilities of surgeon in practice

4. Systemise Operative Surgery

1 Abdominal surgery

2 Haemopoietic

3 Vascular surgery

4 Head and neck surgery

5 Endocrine surgery

6 Breast

7 Thoracic surgery

8 Plastic and reconstructive surgery

9 Genito urinary surgery

10 Nero surgery

11 Orthopedics and traumatology

12 Pediatric surgery

13 Faciomaxillary surgery

14 Minimal Access Surgery

Operative Surgery of Systems in detail

1) Abdominal Surgery

Surgical anatomy of abdomen & viscera

Applied physiology of GIT

Clinical presentation, pathology and pathophysiology of disease process

Investigative modalities & indications

Management decisions

Condition affecting Stomach, duodenum Small Intestine, Hepatobiliary System Pancreas and Large Intestine & Appendix

Abdominal wall hernia, complication, management

Conditions affecting retroperitoneum, retroperitoneal tumors

Mesentery, peritoneal cavity, mesenteric tumors, peritonitis, ascites, mesothelioma,

intraperitoneal abscesses

Surgical management of obesity

Abdominal trauma – investigation and management with respect to organ involvement.

Abdominal emergencies – investigation, management

Principles of operative surgery-

Decision making Pre-operative preparation

Incisions and access

Abdominal closure methods.

Laprostomy

Gastrostomy, ileostomy, colostomy and ostomy management

Gastrointestinal fistulae – management

2. Haemopoetic and lymphatic system

Anatomy & physiology of spleen, lymphnodes and lymphatics system investigative

modalities

Splenomegaly - causes, management

Splenic trauma, splenic conservations, management of Lymphedema

3. Vascular surgery

Vascular anatomy of body

Newer concepts in vascular physiology endothelium dependent relaxation factor Pathology of aneurysms, thrombosis, embolism, atherosclerosis Investigative modalities in vascular surgery

Doppler, Duplex scan, angiogram, DSA, Magnetic Resonance Angiogram. Angioscopy,

Transcutaneous oxygen tension

Varicose veins

Deep vein thrombosis

Vascular malformations

Occlusive arterial diseases – evaluation, management

Arterial aneurysms – Aortic aneurysms

Vascular trauma

Angioplasty & endovascular procedures

Vascular prosthesis, vascular reconstruction Principles of operative surgery vascular bypass,

Carotid body tumor.

Mesenteric and renal vascular disease

4. Head and neck surgery

Surgical anatomy of nasopharynx, oropharynx oral cavity and neck salivary glands, nose & ear, & Principles of investigation.

Neck lumps – differential diagnosis, pathology, investigations and management

Thyroglossal cyst, fistula

Lymphangiomas

Neurogenic tumors of neck

Head and neck cancers – management

Neck dissections for malignancy – radical, modified radical, functional and selective neck injuries

Diseases of salivary glands, salivary gland tumors

Principles of operative surgery- head and neck

Reconstruction after radical surgery – head and neck

5. Endocrine Surgery

Surgical anatomy of thyroid, parathyroid and adrenal

Physiology of thyroid parathyroid and adrenal'

Disorders in function

Principles of investigation of disease process

Hyperthyroidism hypothyroidism

Solitary nodule thyroid- pathology investigation

Diseases affecting thyroid gland

Tumours of thyroid papillary carcinoma, follicular carcinoma, medullary carcinoma

anaplastic carcinoma investigations, management.

Surgery of thyroid gland- thyroidectomy- technique complications

Hyper parathyroidism, hypoparathyroidism

Parathyroid tumors

Surgery of parathyroid

Functional disorders of adrenal gland

Tumors of adrenal gland

Pheochromocytoma

Neuroendocrine tumors- carcinoids

Paraneoplastic syndromes

6. Breast

Surgical anatomy and applied physiology

Investigations for breast disease

Mammogram

Breast infections

Nipple discharge, breast lumps- pathology and investigations

Benign breast disease mastalgna

Carcinoma of breast- epidemiology, aetiology and risk factors, pathology, staging, investigations and treatment:

Carcinoma breast during pregnancy & lactation

Mastectomy- principles of operative surgery

Excision biopsy of breast lumps

Breast conservation in malignancy

Breast reconstruction

Aesthetic breast surgery

Gynaecomastia male breast

Male breast cancer

7. Thoracic Surgery

Surgical anatomy of chest, mediastinum, airway& lungs, diaphragm, heart ad great vessels in thorax and esophagus.

Surgical physiology of chest, pulmonary system esophagus and heart

Bronchoscopy & mediastinoscopy

Trauma to chest- principles of clinical examination, investigations and management

Pneumothorax

Tube thoracostomy

Pleural effusion

Infections of lung, pulmonary tuberculosis

Emphyema

Bronchectasis

Emphysema

Pulmonary aspergillosis

Tumors of pleura and lungs ; Thoracoscopy; thoracoscopic surgery

Techniques of thoracotomy & thoracic surgery

Mediastinal tumors

Deformities of chest wall

Chest wall tumors

Investigations for esophageal disease- esophagoscopy, manometry, ambulatory pH monitoring; Gastro esophageal reflux disease

Hiatus hernia

Barret's esophagus

Esophageal trauma

Esophageal diverticula

Tumours of esophagus

Surgery of esophagus

Congenital anomalies of heart & great vessels and surgical management

Cardiopulmonary by pass- general principles

Principles of myocardial revascularization surgery, coronary artery bypass graft (CABG)

Injury to heart and great vessels

Aneurysms of thoracic aorta, aortic dissection

Complications of thoracic surgery

Diaphragmatic hernia, eventration of diaphragm, traumatic rupture of diaphragm

8. Plastic and Reconstructive surgery

☆

Principles of plastic surgery- tissue handling excision & revision of scars and contractures, skin grafting flaps microsurgery, bone grafting nerve repair.

Reimplantation of amputated limbs, digits and organs

Care of burns and complications

Cosmetic Surgery

Reconstructive surgery reconstruction after head and neck surgery reconstruction of chest wall defects, reconstruction of abdominal wall

Hernia surgery

Craniofacial surgery

9. Genito urinary surgery

Surgical anatomy and physiology of genitor urinary system

Symptomatology and clinical examination

Investigations- GU disease

Oliguria, anuria- investigation, management

Congenital anomalies- genitourinary system

Hematuria

Infections of urinary tract

Tuberculosis of kidney and urinary tract

Renal trauma, trauma of urinary tract

Tumors of kidney and urinary tract

Urinary retention

Urinary incontinence

Urinary fistulae

Urinary diversion

Diseases of prostate and seminal vesicles

Carcinoma of prostate

Hypospadias, epispadias, phimosis

Urethral injuries

Extravasation of urine

Urethral strictures

Paraphimosis

Carcinoma of penis

Imperfect descent of testes

Torsion testes

Hydrocele, scrotal swellings- investigations, pathology, treatment

Epididiymo orchitis

Testicular tumors

Fourniers gangrene

Carcinoma of scrotum

Infertility investigations, management

Impotence –Management

Prosthetics in urological surgery

Principles of operative surgery- exposure of kidney, nephroectomy, surgery for renal injuries

Genitourinary stents

Renal transplantation

10. Neurosurgery

Fundamental anatomy of skull & brain

Investigations in neurosurgical practice- CT scan, angiogram, MRI Biopsies Congenital anomalies of central nervous system

Skull tumors

Head injury – assessment, classification, investigation, treatment

Intracranial pressure monitoring

Brain tumors- pathology, treatment

Intracranial infections- meningitis, brain abscess

Intracranial hemorrhage

Hydrocephalus

Principles of operative surgery- burr hole, craniotomy, reconstruction of skull bone defects, drainage of intracranial hematoma

Post operative management in neurosurgical patients

Stereotactic surgery

12. Pediatric surgery

Essentials of anatomy of neonate

Physiology of new born

Principles of surgery and anaesthesia in new born and children

Fluid and electrolyte management

Common congenital anomalies- cleft lip, cleft palate, tracheoesophageal fistula, gastroschisis, exomphalos, umbilical & inguinal hernia, phimosis, undescended testis.

Hypertrophic pyloric stenosis

Torsion testes, acute scrotum

Acute abdomen in neonates and children

Pediatric malignancies- neproblastoma, neuroblastoma

Jaundice biliary atresia

Malrotation of intestine

Intestinal atresia

Meconeum ileus

Imperforate anus

Hirschrprung's disease

Bleeding per rectum, hematuria

13. Facio- maxillary surgery

Surgical anatomy of face and facial skeleton

Imaging anomalies

Principles of surgery of face

Surgical techniques placement of incisions

Tumors of face pathology and management

Management of Jaw tumors, malignant tumors of mandible maxilla

Congenital and developmental anomalies of teeth

Faciomaxillary trauma principles of management- assessment, primary management maintaining airway imaging , surgical principles of treatment

Features of maxilla- Le Fort Classification

Fractures of mandible dislocation

Fracture of zygomatic bone and arch

14. Minimal Access Surgery (MAS)

Evolution of MAS

Demerits of conventional open surgery

Nature and principles of MAS

Scope of MAS- Laparoscopic, Thoracoscopic, Endoluminal (CPI and vascular), Perivisceral endoscopic endopelvic, intra articular joint surgery, intracranial spinal combined (MAS combined with open surgery, combined MAS)

Techniques of MAS- in GI surgery, Urological surgery, Thoracic Surgery, Orthopaedics, cardiovascular surgery and Neurosurgery

Pathophysiology of pneumo peritoneum

Principles of anaesthesia relating MAS

Hazards & limitations of MAS

Innovations- in principles and technology of MAS

Standardization of training in MAS

<u>Syllabus of Practicals</u>

1. Clinical Skills expected

a. Diagnosis and management of acute abdominal emergencies

b. Total parenteral nutrition

c. Initial Assessment and resuscitation of head, chest and abdominal injuries

3. Practical skills expected

A) **General Surgery & Specialities**

Endoscopy & Laparoscopy-Assisting ten cases.

Thoracic and peritoneal aspiration and drainage-fifty cases

Draining abscesses-five hundred cases

Standard surgical approaches

Laparotomy-one hundred cases

Removal of simple cutaneous and subcutaneous swellings-five hundred cases

Appendicectomy-fifty cases

Strangulated hernia-thirty cases

Bowel resection and anastomosis-ten cases

Hernioplasty-thirty cases

Varicose veins-twenty cases

Sigmoidoscopy and minor anal- rectal procedures-fifty cases

Excision of breast lumps-fifty cases

2.11 No: of hours per subject

Present in clause 2.10.

2.12 Practical training given

Present in clause 2.10.

2.13 Records

Present in clause 2.21

2.14 Dissertation: As per Dissertation Regulation of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re

evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Present in clause 2.10.

2.16 Project work to be done if any

As per direction of the HOD from time to time.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

TEXTBOOKS

1.Short Practice of **surgery**- *Bailey & Love.*

*2.*An introduction to **the** symptoms and signs of surgical Disease-Norman L. Browse.

3. Pye's Surgical Handicraft.

Reference books

1.Test book of surgery by **Sabiston**

2. Hamilton Bailey's Physical Signs in Surgery.

3. ASI Text book of surgery Ed.A.K. HAI

4. Principles and Practice of Surgery Eds-Garden, **Bradbury** Forsythe

5.. Clinical Methods in Surgery. By K. DAS, M.B. (Cal.), F.R.C.S. (Eng. and Edin.),

2.19 Reference books

General Surgery

1. Short practice of surgery – Bailey and Love

2. Essential Surgical practice- Cuschieri

3. Meingot's Abdominal Operations

4. Principles of Surgery by Schwartz

Clinical Surgery

1. Demonstrations of physical signs and Clinical surgery- Hamilon Bailey

2. Manual on Clinical Surgery Das

3. Clinical Surgery Pearls – by Dr. R. Dayananda Babu

Emergency and Operative Surgery

1. Text book of Operative General Surgery- Farquharson

2. Emergency surgery- Hamilton Bailey

Surgical Anatomy

1. Regional Applied Anatomy –Last

2. Synopsis of Surgical Anatomy- Lee Mc Gregor

3. Surgical Anatomy and Technique by Skandelakis

Surgical Pathology

1. Basic Pathology – Robbins

2. Pathology for Surgeons in Training- Gardner

Miscellaneous

Any one standard textbook on each Critical care,Statistics and Medical Ethics

2.20 Journals

Indian Journal of Surgery

British Journal of Surgery

Annals of Surgery

Surgical clinics of North America

World Journal of Surgery

Asian Journal of Surgery

And all other indexed Surgical Journals.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available

to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry.. The guidelines for preparing the logbook is available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATION

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of three short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

Evaluation

1) Six monthly **internal assessment** (both theory & practical) of students shall be conducted & feedback given to them.

2) **Logbook**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this

Logbook of the special procedures/ operations performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Postgraduate Teacher / Head of the Department. This shall be made available to the

Board of Examiners for their perusal at the time of his / her appearing at the final Examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. Diploma students, also, should maintain a similar logbook.

3) A Checklist for evaluation of Seminar, Journal Club and Clinical Presentations done by the Candidates shall be maintained for each candidate and evaluated on a quarterly basis.

Scheme of Examination- General Surgery

1. *Theory*

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I: Basic Sciences - 100 marks

1. Anatomy
2. Physiology
3. Other basic science topics covered in syllabus

Introduction to Surgery, Basic Surgical Principles. Wounds, tissue repair and scars. Critical care; fluid, electrolyte and acid-base balance; blood transfusion. Nutritional support and rehabilitation. Anaesthesia and pain relief. Wound infection. Special infections. Acquired immunodeficiency Syndrome (AIDS). Sterile precautions. Transplantation. Tumors, Cysts, Ulcers, Sinuses. Plastic and reconstructive surgery, skin lesions. Burns. Arterial disorders. Venous disorders. Lymphatic system. Day care surgery. Audit in surgery. Surgical ethics.

Paper II: 100 marks

Eye and orbit. Cleft lip and palate, developmental abnormalities of the face, palate, jaws and teeth. Maxillofacial injuries. Nose and sinuses. Ear. Oral and oropharyngeal cancer and pre cancerous conditions. Salivary gland disorders. Pharynx, larynx and neck. Thyroid gland and the thyroglossal tract. Parathyroid and Adrenal glands. Breast. Thorax. Heart and Pericardium. Triage .Trauma scoring systems. Traumatic wounds, principles of management. Gunshots and blast wounds. Initial Assessment and Resuscitation. Clinical assessment of the

injured patient. Maintenance of airway and ventilation. Haemorrhage and shock Chest , Abdomen and Pelvis Cardiorespiratory physiology as applied to trauma. Penetrating chest injuries and pneumothorax. Rib fractures and flail chest. Abdominal and pelvic injuries

Paper III: 100 marks

Esophagus. Stomach and duodenum. Liver. Spleen. Gallbladder and bile ducts. Pancreas. Peritoneum, omentum, mesentery and retroperitoneal space. Small and large intestines. Intestinal obstruction. Vermiform appendix. Rectum. Anus and anal canal. Hernias, Umbilicus, Abdominal wall. Principles of Laparoscopic surgery.

Paper IV: 100 marks

Recent advances in surgery

Neuro-surgery: Fundamental anatomy of skull & brain. Investigations in neurosurgical practice- CT scan, angiogram, MRI, Biopsies. Congenital anomalies of central nervous system

Skull tumors. Head injury – assessment, classification, investigation, treatment

Intracranial pressure monitoring. Brain tumors- pathology, treatment.

Intracranial infections- meningitis, brain abscess. Intracranial hemorrhage, Hydrocephalus

Principles of operative surgery- burr hole, craniotomy, reconstruction of skull bone defects, drainage of intracranial hematoma. Post operative management in neurosurgical patients Stereotactic surgery.

Facio- maxillary surgery, Jaw tumors, malignant tumors of mandible maxilla, Swellings of gums

Genito -Urinary System: Urinary symptoms, Investigation of the urinary tract, anuria. Kidneys and ureters. Urinary bladder. Prostate and seminal vesicles. Urethra and penis. Testis and scrotum.

Pediatric surgery-Essentials of anatomy of neonate, Physiology of new born,Principles of surgery and anaesthesia in new born and children. Fluid and electrolyte management.

Tracheoesophageal fistula,gastroschisis, exomphalos, umbilical & inguinal hernia, phimosis, undescended testis. Hypertrophic pyloric stenosis,Torsion testes, acute scrotum. Acute abdomen in neonates and children. Pediatric malignancies- neproblastoma, neuroblastoma. Jaundice biliary atresia,Malrotation of intestine,Intestinal atresia,Meconeum ileus,Imperforate anus. Hirschrprung's disease, Bleeding per rectum, hematuria.

Minimal Access Surgery (MAS) Evolution of MAS. Nature and principles of MAS, Techniques of MAS- in GI surgery, Urological surgery, Thoracic Surgery, Pathophysiology of pneumo peritoneum. Principles of anaesthesia relating MAS

Note: The distribution of chapters / topics shown against the papers are suggestive only.

2. *Clinical* *3*00 marks

There shall be one long case and three short cases to be examined and presented by each candidate.

Type of cases

Long case	1	150 marks
Short cases	3 (50x3)	150 marks

iii) Viva voce 100 marks

1) Viva-voice Examination: (80 marks)
   All examiners will conduct viva-voice on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, Histo-pathology slides, X-rays, ultrasound, CT scan images, etc., for interpretation. Questions on operative surgery and use of instruments will be asked. It includes discussion on dissertation also.

2) Log book: (20 marks)
   A log book must be presented at the time of practical examination. It should be the actual work performed/ assisted/observed by the candidate during the tenure of the course.

Maximum marks for	**Theory**	**Practical**	**Viva**	**Grand Total**
M.S Gen. Surgery	**400**	**300**	**100**	**800**

Reg No	**Long case 150**	**Short Case-150**			**Total 300**	**VIVA 80 marks**				**Log 20 marks**	**Total Viva 100**
		1	**2**	**3**		**1**	**2**	**3**	**4**		

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Present in clause3.3

3.6 Model question paper for each subject with question paper pattern [specimen available in kuhs website]

QP Code: **Reg.No.:……**

MS Degree Examinations in General Surgery

(Model Question Paper)

Paper I – Surgery including Basic Sciences

Time: 3 hrs Max marks :100

Answer all questions

Draw diagrams wherever necessary

Essay: (20)

1. Describe the anatomy and surgical importance of subphrenic spaces and discuss the management of subphrenic abcisses.

Short essays: (8X10=80)

2. Evaluation of thyroid nodules
3. Rotation of the midgut
4. Medical managements of peptic ulcer
5. Hospital acquired infections
6. Post operative analgesics
7. Meconium ileus
8. Deep vein thrombosis.

****

QP Code: **Reg.No.:……**

MS Degree Examinations in General Surgery

(Model Question Paper)

Paper II – Surgery including Surgical Specialties

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Essay: (20)

1. Describe the aetiology pathology clinical presentation and management of obstructive jaundice

Short essays: (8X10=80)

2. Branchial cyst
3. Adamantinoma
4. Zollinger- Ellison syndrome
5. Skin grafts
6. Flail chest
7. Maxillo facial injuries
8. Anorectal anomalies
9. Therapeutic embolization

****

QP Code: **Reg.No.:……**

MS Degree Examinations in General Surgery

(Model Question Paper)

Paper III – Surgery including Surgical Specialities.

Time: 3 hrs Max marks:100

Answer all questions

Draw diagram

Essay: (20)

1. Classify tumours of testis and discuss the management of teratoma of Testis

Short essays: (8X10=80)

2. Medullary carcinoma of thyroid
3. Meningomyelocele
4. Subdural hematoma
5. Frozen shoulder
6. Intussusception
7. Premalignant conditions of the skin
8. Stenosing tenosynovitis
9. Gardner's syndrome

****

QP Code: **Reg.No.:……**

MS Degree Examinations in General Surgery

(Model Question Paper)

Paper IV – Recent Advances in Surgery

Time: 3 hrs Max marks:100

Answer all questions

Draw diagrams wherever necessary

Essay: (20)

1. Discuss the recent advances in the management of advanced breast carcinoma

Short essays: (8X10=80)

2. Lasers in surgery
3. Radio frequency ablations
4. Endoscopic sclerotherapy
5. ESWL
6. No Scalpel Vasectomy
7. Multi organ dysfunction syndrome
8. Blood substitutes
9. Surgery for impotence

****

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

Clinical / Practical and Oral

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of three short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

The viva The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty. The viva should cover pathology specimens, X Rays, imaging reports, instruments and operative surgery.

Reg No	Long case 150	Short Case-150			Total 300	VIVA 80 marks				Log 20 marks	Total Viva 100
		1	2	3		1	2	3	4		

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MS OPHTHALMOLOGY

Course Code 218

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course

M.S. Ophthalmology

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Should be aware of the rationale use of antibiotics and its current protocols.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.

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- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.
- The candidate should develop compassionate attitude towards patients and should have an aptitude to give palliative care for patients who are suffering from end stage disease.
- Should be able to give visual rehabilitation for patients with very poor vision

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As Per clause 2 of the curriculum.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As mentioned in the clause 10 of the curriculum.
The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

Not applicable.

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2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

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- All Post Graduate students should take part in the teaching of paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. The involvement of the student should be documented in the log book. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Log Book

1. A log book showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

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Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the Ethical committee and PG training cum Research Committee of the concerned institution. The synopsis shall be sent to within the first 6 months from the commencement of the course or as notified by the university in the calendar of events to the Registrar.

Submission of dissertation

The dissertation shall be submitted to the Registrar (Evaluation) of the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

Teaching Program- OPHTHALMOLOGY

General Principles

Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training is skill oriented. Learning in postgraduate program should essentially be self-directed and primarily emanating from clinical and academic work. The formal sessions should merely be meant to supplement this core effort.

Teaching Sessions

- Seminar presentations including detailed topics covering all aspects of ophthalmology shall be taken up by the residents.
- Journal clubs shall be held for having wider view of the subject and latest research work and papers discussed in routine.
- Case discussions should be mandatory for PG students so as to be expert in clinical examination, reach a diagnosis and then plan for appropriate and required management.

Teaching Schedule

In addition to bedside teaching rounds, in the department there should be daily hourly sessions of formal teaching per week. The suggested departmental teaching schedule is as follows:

1. Seminar Presentation once in a week
2. Journal Club once in a week

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3. PG Case Discussion twice in a week
4. Group Discussion once in a week
5. Guest Lecture 4 to 6 in a year

Note:

- All sessions shall be attended by all the faculty members except for those on emergency duties. All Junior and Senior Residents are supposed to attend the session.

- All teaching sessions should be assessed by the chairing consultant at the end of the session and log books signed.

- Attendance of the Residents at various sessions has to be at least 75%.

2.10 Content of each subject in each year

Theory

During the training period effort should always be made that adequate time is spent in discussing ocular health problems of public health importance in the country.

Section I: Anatomy and Physiology

- Embryology and Anatomy
- Physiology of the Eye
- The Physiology of Vision
- The Neurology of Vision

Section II: Ophthalmic Optics

- Elementary Optics
- Elementary Physiological Optics
- Refraction
- Refractive Errors of the Eye

Section III: Ocular Examination Techniques and Ocular Therapeutics

- Ocular Symptomatology
- Assessment of Visual Function
- Examination of the Anterior Segment
- Examination of the Posterior Segment and Orbit
- Ocular Therapeutics
- Ocular Microbiology

Section IV: Diseases of the Eye

- Diseases of the Conjunctiva
- Diseases of the Cornea
- Diseases of the Sclera
- Diseases of the Uveal Tract
- The Lens
- The Glaucomas

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- Diseases of the Retina
- Diseases of the Vitreous
- Diseases of the Optic Nerve
- Intraocular Tumours
- Injuries to the Eye

Section V: Disorders of Motility

- Anatomy and Physiology of the Motor Mechanism
- Comitant strabismus
- Incomitant Strabismus

Section VI: Diseases of the Adnexa

- Diseases of the Lids
- Diseases of the Lacrimal Apparatus
- Diseases of the Orbit

Section VII: Systemic Ophthalmology

- Diseases of the Nervous System with Ocular Manifestations
- Ocular Manifestatioins of Systemic Disorders
- Systemic drugs – Effects on eye

Section VIII: Preventive Ophthalmology

- Genetic Ophthalmology
- The Causes and Prevention of Blindness
- Eye Banking
- Eye Camps

Section IX: Surgical Instruments in Ophthalmology

- Surgical Instruments in Ophthalmology
- Local Anaesthesia in Ophthalmology
- Lasers in Ophthalmology

Practical

During the training period, PG students should learn various clinical and skilled work. PG's should be encouraged to assist/perform the procedures both minor & major including given below:

Minor Procedures

- Thorough ocular examination.
- Pediatric ocular examination.
- Removal of foreign body.
- Syringing and probing
- Pterygium excision
- Chalazion excision
- I & D for Adnexal infections(stye)
- Posterior/Anterior sub tenon injection
- Intravitreal injection
- Tarsorraphy
- Epilation

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- Corneal Scrapping
- Conjuctival swab
- Anterior chamber tap
- Subconjuctival injection

Major Procedures

- SICS with IOL implantation
- Phacoemulsification with foldable IOL
- Glaucoma surgery
- Lid surgeries including entropion, ectropion & ptosis
- Ocular trauma management
- Enucleation, Evisceration and Exenteration
- Corneal transplant
- Basic Squint Surgery.
- Management of trauma including penetrating injury
- DCT and DCR

Surgical Training

It may be helpful to expose all PG students to artificial eye for various surgical steps and to hone surgical skills.

Surgical Skills

- Perform all minor and at least DCT, SICS with IOL implantation, Trabeculectomy
- To manage trauma cases including penetrating injury

2.11 No: of hours per subject

Refer under clause 10 of the curriculum.

2.12Practical training given

Refer under clause 10 of the curriculum**.**

Posting

- All PG students shall be posted in all units in rotation.
- OT duties shall be mandatory for all PG students.
- PG students should be casualty duties to deal with any ocular emergency .
- Should be posted in speciality clinic- Retina, Glaucoma, squint for one month during the three year period
- Should be given refraction posting one month each in every year
- Effort should be made to expose PG students to the latest techniques even though they may have to be sent for some time to the

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centres performing and using latest instruments or surgeries.

2.13 Records

Not applicable

2.14 Dissertation: As per dissertation regulating of KUHS

Changing the guide as stipulated by the KUHS norms

Dissertation

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

I. Identify a relevant research question.
II. Conduct a critical review of literature.
III. Formulate a hypothesis.
IV. determine the most suitable study design
V. State the objectives of the study
VI. Prepare a study protocol.
VII. Analyze and interpret research data, and draw conclusions.
VIII. Write a research paper.

2.15 Speciality training if any

Speciality training in Neuro medicine and Radiodiagnosis.

2.16 Project work to be done if any

Not applicable

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2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks

Core books

Parson's Diseases of the Eye -Sihota & Tandon
Duanes Text book of Ophthalmology
Refraction Duke Elder
Adlers Physiology
Wolf's Anatomy of eye
Duke Elder's Refraction
Stallard's Eye Surgery
Practical Orthoptics in treatment of Squint Keith Lyle
Glaucoma Shields

2.19 Reference books

Ophthalmology Yanoff Duker
Retina Stephen. J. Ryan
Systems of Ophthalmology Duke Elder
Principles and Practices of Ophthalmology Peyman, Sander & Goldberg
Diagnosis and Therapy of Glaucoma Becker Shaffer
Glaucoma Chandler & Grant
Mastering Phacoemulsification Paul. S.Koch
Cataract Surgery and its complications Jaffe
Automated Static Perimetry Anderson and Patela
Cornea Smolin
Diseases of Uvea – Nozik
Squint – Pradeep Sharma
Neurophthalmology - Walsh

2.20 Journals

American Journal of Ophthalmology
British Journal of Ophthalmology
Archives in Ophthalmology
Ophthalmology
Indian Journal of Ophthalmology
International Ophthalmology Clinic
DOS Times
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2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3 EXAMINATIONS

3.1 Eligibility to appear for exams

- Minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination).**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

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3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

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3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases, two fundus cases one refraction, one pathology slide and one microbiology slide or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.
(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.
Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Assessment- Ophthalmology

All the PG residents should be assessed daily for their academic activities and also periodically.

General Principles

- The assessment is valid, objective and reliable.
- It covers cognitive, psychomotor and affective domains.
- Formative, continuing and summative (final) assessment is also conducted in theory as well as practical/clinicals. In addition, d is also assessed separately.

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1. **Personal attributes:**

- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.
- **Motivation and Initiative:** Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.
- **Honesty and Integrity:** Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

2. **Clinical Work:**

- **Availability:** Punctual, available continuously on duty, responds promptly on calls and takes proper permission for leave.
- **Diligence:** Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, competent in clinical case work up and management.
- **Academic ability:** Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.
- **Clinical Performance:** Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing Documents of the case history/examination and progress notes in the file (daily notes, round discussion, investigations and management) Skill of performing bed side procedures and handling emergencies.

3. **Academic Activity:** Performance during presentation at Journal club/ Seminar/ Case discussion/Stat meeting and other academic sessions. Proficiency in skills as mentioned in job responsibilities.

Job Responsibilities

During first year the resident will work under direct supervision of the 2nd/3rd year resident/senior resident and consultant on call. She/he will be responsible for asking detailed history, examination of patients as per the file record and send appropriate investigations as advised by seniors. Initially all procedures are to be observed and then done under supervision of seniors and during 2nd/3rd year can do procedures independently.

In 2nd year, resident is posted in special clinics like Cornea clinic, Uveitis Clinic, Retina Clinic, Squint Clinic and Glaucoma Clinic also and making of discharge cards including

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referrals. They may be posted to departments like Neurology, Radiodiagnosis

In 3rd year, resident is also encouraged to make independent decisions in management of cases. She/he is also involved in teaching of undergraduate students.
In 2nd and 3rd year Junior Residents should be performing surgeries stepwise and then independently under the guidance of Senior Residents/ Consultants.

SCHEME OF EXAMINATION

- Theory 400 marks (M.D/M.S)
- Clinical / Practical 300 marks
- Oral 100 marks

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Practicals: Total 300 marks distributed between long case/ short case/ practicals depending on the speciality.

Oral: 100 marks for oral examination including 20 marks for Log Book

Pass Criteria: 50 % Separate minimum for

(1) Theory with 40% minimum for each paper

(2) Clinical / practical, and oral examinations.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40										
2	Paper II	100	40										
3	Paper III	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

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Paper I - Basic Sciences Applied to Ophthalmology
Paper II – Refraction, Strabismus, Neurophthalmology & Systemic Ophthalmology
Paper III – Diseases and Surgery of Anterior Segment, Posterior
Segment and Ocular Adnexae
Paper IV – Recent Advances in Ophthalmology

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No:**

MS Degree Examinations in Ophthalmology
(Model Question Paper)
Paper I - Basic Sciences Applied to Ophthalmology
Time: 3 hrs Max marks:100
• Answer all questions
• Draw diagrams wherever necessary

Essays: (20)

1. Describe in detail the aqueous dynamics.

Short Essays: (8x10=80)

2. Role of stem cell transplantation in ophthalmology
3. Mebomian carcinoma and its histopathology
4. Contrast sensitivity
5. Visual assessment in pre-school children
6. Humphrey perimetry and its role in the detection of glaucoma progression
7. Role of fundus fluorescein angiography in the management of diabetic retinopathy.
8. Localisation of intraocular foreign body
9. Immunosuppression in the management of uveitis

QP Code: **Reg.No**

MS Degree Examinations in Ophthalmology
(Model Question Paper)
Paper II – Refraction, Strabismus, Neurophthalmology & Systemic Ophthalmology
Time: 3 hrs Max marks:100
• Answer all questions
• Draw diagrams wherever necessary

Essays: (20)

1. Discuss the various methods of management of myopia

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Short Essays: (8x10=80)

2. Painful ophthalmoplegia
3. Adaptation to strabismus
4. Discuss the cause for III nerve palsy
5. Describe the ocular manifestation of rheumatoid arthritis
6. Cortical blindness
7. Clinical features and management of anterior ischemic optic neuritis
9.Superior oblique palsy.

QP Code: **Reg.No:**

MS Degree Examinations in Ophthalmology

(Model Question Paper)

Paper III – Diseases and Surgery of Anterior Segment, Posterior Segment and Ocular Adnexae

Time: 3 hrs Max marks:100

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: (20)

1. Discuss the aetiology and clinical features of bacterial keratitis. Outline the method of investigation and management

Short Essays: (8x10=80)

2. Band shaped keratopathy
3. Discuss the management of paediatric cataract
4. Steroid responsiveness
5. Pseudo exfoliation syndrome
6. Clinical features of irido corneal endothelial syndrome
7. Role of periocular steroids in the management of anterior uveitis
8. Classification and differential diagnosis of diabetic retinopathy.
9. Detection, management and follow up of retinopathy of prematurity

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QP Code: **Reg.No:**

MS Degree Examinations in Ophthalmology

Paper IV – Recent Advances in Ophthalmology

Time: 3 hrs Max marks:100

- **Answer all questions**
- **Draw diagrams wherever necessary**

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Essays: (20)

1. Recent trends in the management of keratoconus

Short Essays: (8x10=80)

2. Imaging techniques in glaucoma
3. TORIC IOL
4. Ocular Response Analyser- its use in the management of glaucoma
5. Balloon dacryocystoplasty
6. Osteoodento keratoprosthesis
7. Current trends in the management of subluxated lens
8. Surgical management of duanes retraction syndrome
9. Use of botulinum toxin in ophthalmology

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of

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which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate internal examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva:

Viva: Total - 100 marks. 80 marks for oral examination and 20 marks for Log Book.

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MS ORTHOPAEDICS

Course Code 219

(2016-17 Academic year onwards)

2016

2. COURSE CONTENTS

2.1 Title of course:

M.S. Orthopaedics

2.2 Objectives of course

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As per clause 2.10

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As per clause 2.10

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

As per clause 2.10

2.8 Branches if any with definition

Not Applicable

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree / Diploma to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and

in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

SYLLABUS

THEORY

1. Methods of Clinical Examinations
2. Basic Sciences

(A) Structure & functions of Bone Cartilage Synovium Muscle Ligment Tendon
(B) Relevant surgical Anatomy of Axial and appendcular skeleton
Physiologic basis of functioning of skeletal system
(C) Biochemical basis of function of Bone
(D) Pathologic basis of Orthopaedic diseases
(E) Pharmaco therapeutics in Orthopaedics
(F) Microbiological basis of Orthopaedic infection
(G) Orthopaedic implants, Metals, Corrosion, Lubrication and implant failure, Bio Tribology
(H) Research Methodology
Refining a research question, Steps involved in refinement, formulating a hypothesis, steps involved in preparation of research protocol, data collection and data presentation
(I) Statistics
(J) Level of evidence

3. Traumatology

Injuries of axial and appendicular skeleton and associated soft tissues, their clinical examination, radiography and modes of treatment

General Consideration: Fracture healing,
Conservative treatment of fractures
Internal fixation
principles External
fixation principles
Open fractures
Pathologic fractures
Bone grafting Poly Trauma Trauma
Care
Individual injuries to upper limb, lower limb, spinal column, shoulder girdle and pelvis girdle in detail

4. Diagnostic Imaging in Orthopedics Radiography

MRI and CT scan Nuclear Medicine Ultrasonography

5. Metabolic Bones diseases
6. Endocrine disorders of Bone
7. Bone & Joint infection

8. Poliomyelitis of skeletal system
9. Cerebral palsy and other spastic disorders
10. Systemic complication in Orthopedics

    Shock Crush syndrome DIC Thromboembolism
    Fat Embolism syndrome
    Gas gangrene
    Tetanus

11. Orthopaedic anaesthesia, Regional blocks, Pain management and Care of critically ill patient
12. Neoplasms of Bone & Joint and related structures
13. Osteoarthritis
14. Rheumatoid arthritis
15. Disorders of synovium
16. Peripheral Nerve injuries and dysfunction
17. Biomaterials in Orthopaedics
18. Illizarov – Basic principles and principles of deformity correction
19. Arthroscopy
20. Arthrosplasty
21. Hand injuries with reconstruction principles
22. Re implantation
23. Regional Orthopaedic disorders
24. Congenital anomalies
25. Paediatric Orthopaedics
26. Analysis of Gait
27. Microsurgery in Orthopaedics
28. Arthrodesis
29. Prosthetics and Orthotics
30. Amputation
31. Rehabitation Orthopaedics
32. Disability evaluation
33. Bone substitutes
34. Recent advances in Orthopaedics
35. Navigation in Orthopaedics
36. Spinal injuries and management
37. Pelvi Acetabular injuries
38. Spinal Deformities
39. Spinal infections
40. Disc disease and degenerative disorders

Course duration

3 years – Posting in each unit by rotation and 1 month each in physical Medicine, Plastic Surgery, Anaesthesia and intensive care

Teaching Schedule

1. Clinical case discussion every day
2. Topic presentation – once a week
3. Journal club – once a week
4. Continuing orthopaedic education programme at least twice a year
5. Seminar once in two weeks
6. Routine ward work and preoperative evaluation
7. Performing and assisting operation under guidance of staff members
8. Casualty management under supervision
9. Outpatient and plaster room management
10. Maintenance of Log book
11. Periodic internal theory and clinical assessment.

PROCEDURES THAT SHOULD BE DONE INDEPENDENTLY UNDER SUPERVISION

1. Reduction and plastering of common fractures in upper and lower limbs - 10
2. Reduction and immobilization common dislocations in upper and lower limbs - 10
3. Application of upper tibial, lower femoral and skull traction - 10
4. Open reduction and plate and screw fixation of forearm fracture - 3
5. Open reduction and plate and screw fixation of humerus fracture - 2
6. Open reduction and nailing of femur fracture - 2
7. Open reduction and nailing of tibial fracture
8. Hemarthroplasty - 3
9. Fixation of trochanteric fracture - 3
10. Carpal tunnel decompression, DQ release and trigger finger release - 2 each
11. BK and AK amputation - 1 each
12. Surgery for recurrent dislocation of patella and shoulder - 1each
13. Diagnostic Arthroscopy
14. Tendon repair
15. Wound debridement and external fixation

2.11 No: of hours per subject

As per clause 2.10

2.12 Practical training given

As per clause 2.10

2.13 Records :

Present clause 2.21.

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any:

As per clause 2.10

2.16 Project work to be done if any

Not Applicable.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/ state conference and to present one research paper which should be published/ accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Prescribed Books

1. Graham Apley – System of Orthopaedics
2. Fractures and Joint injuries – Watson Jones
3. Orthopaedics – Samuel F Turek
4. Mercer Orthopaedic Surgery
5. Outline of fractures – Adam's
6. Outline of Orthopaedics – Adam's
7. Clinical Surgery – Das – Chapter on Orthopaedics
8. Crawford Adam's – Operative techniques (orthopaedics)
9. Text book of Orthopaedics and fractures GS Kulkarni

2.19 Reference books

1. Campbell's Operative Orthopaedics
2. Tachdjian's Pediatric orthopaedics
3. AO principles of fracture management
4. Rockwood and Green Fractures in adults
   Fractures in children

2.20 Journals

1. JBJS
2. British Journal of Orthopaedics
3. Indian Journal of Orthopaedics
4. Journal of Paediatric Orthopaedics
5. OCNA (Orthopaedic Clinic of North America)
6. CORR (Clinical Orthopaedics and related research)
7. JOT (Journal of Trauma)

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the

training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3.EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of three short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

- Theory 400 marks
- Clinical / Practical 300 marks
- Oral 100 marks

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Practicals: Total 300 marks distributed between long case/ short case/ practicals.

Long case-150, 3 short cases 50 marks each.

Oral: 100 marks for oral examination.

Pass Criteria: 50 % Separate minimum for

(1) Theory with 40% minimum for each paper
(2) Clinical / practical, and oral examinations.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Paper I - Basic Sciences Applied to Orthopaedics & Traumatology
Paper II – Traumatology and Fractures
Paper III – Orthopaedic Diseases
Paper IV – Recent Advances in Orthopaedics and Traumatology

Structure of each question paper — Total marks 100

1. Essay question — 1 x 20 marks = 20
2. Short answers — 10 x 8 marks = 80

3.6 Model question paper for each subject with question paper pattern

1)

QP Code: **Reg. No. :……**

MS Degree Examinations in Orthopaedics
(Model Question Paper)

Paper I - Basic Sciences Applied to Orthopaedics & Traumatology

Time: 3 hrs **Max marks: 100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: **(20)**

1. Discuss the healing of fractures . How will you manage infected non union of fracture shaft of femur in 20 year old male following a compound fracture.

Short Essays: **(8x10=80)**

2. Medical management of Rheumatoid arthritis
3. Cement disease
4. Prevention of surgical site infection
5. Madura foot
6. Fat embolism
7. Triple arthrodesis
8. EMG
9. Functional cast brace

****

2)

QP Code: **Reg. No. :……**

MS Degree Examinations in Orthopaedics

(Model Question Paper)

Paper II – Traumatology and Fractures

Time: 3 hrs **Max marks: 100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: **(20)**

1. Classify fractures of acetabulum. Discuss the clinical evaluation, diagnosis and management of bi column acetabulum in an young adult

Short Essays: **(8x10=80)**

2. Traumatic spondylolisthesis of axis
3. Acromioclavicular subluxation
4. Lateral condyle fracture in children
5. Lisfranc's injury
6. ACL deficient knee
7. Pilon fracture
8. Fracture scaphiod
9. Fracture patella

☆

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3)

QP Code: **Reg. No. :……**

MS Degree Examinations in Orthopaedics

(Model Question Paper)

Paper III – Orthopaedic Diseases

Time: 3 hrs **Max marks: 100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: **(20)**

1. Discuss the mechanism of tumour metastasis to bone. Discuss the clinical features diagnosis and management of metastatic bone disease

Short Essays: **(8x10=80)**

2. Foot drop
3. Synovial chondromatosis
4. Chondroblastoma
5. Idiopathic Chrondrolysis of hip
6. Caries sicca
7. Neuritis in Hansen'sdisease
8. Post polio syndrome
9. Vit. D resistant rickets

****

4)

QP Code: **Reg. No. :……**

MS Degree Examinations in Orthopaedics

(Model Question Paper)

Paper IV – Recent Advances in Orthopaedics and Traumatology

Time: 3 hrs **Max marks: 100**

- **Answer all questions**
- **Draw diagrams wherever necessary**

Essays: **(20)**

1. Classify distal radius fracture fractures. Discuss the recent advances in the management of distal radius fractures

Short Essays: **(8x10=80)**

2. Cementing techniques
3. Ponseti technique
4. Limb salvage in osteosarcoma
5. Biological agent in rheumatoid arthritis
6. Local antibiotic delivery system
7. Total shoulder replacement
8. Double bundle ACL reconstruction
9. Safe surgical dislocation of hip

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☆

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

a. Long case one 150 marks
b. Short case three 50 marks each
c. Viva voce 100 marks (Details given in section 2.32)

.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience

after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

d. Orthotics, Surgical Instruments & implants 20 marks
e. Imaging (X rays, CT sans and MRI) 20 marks
f. Orthopaedic pathology (Gross specimens & histopathology slides):20 marks
g. Operative surgery (Orthopaedic Operations) 20 marks
h. Marks allotted after evaluation of Log book 20 marks

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MS OBSTETRICS AND GYNAECOLOGY

Course Code 220

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.S. Obstetrics and Gynaecology

2.2 Objectives of course

GOALS

The goal of MD course in Obstetrics & Gynaecology is to produce a competent Obstetrician & Gynecologist who:

Provides a comprehensive health care with a life cycle approach to the health needs of women Recognizes the health needs of adolescents, females in reproductive age group & post menopausal females & course out professional delegations in keeping with principles of National Health Policy and professional ethics.

Is competent to manage the pathological states related to reproductive system with knowledge of Anatomy, physiology, pharmacology & Patho-physiology.

Is aware of contemporary advances & developments in the field of maternal health & other related issues.

Is oriented to principles of research methodology.

Has acquired skills in educating medical and paramedical professionals.

OBJECTIVES:

The objectives of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

1. To provide quality maternal care in the diagnosis and management of Antenatal, Intra-natal & Post natal period of normal and abnormal pregnancy.
2. To provide effective & adequate care to the obstetrical and early neonatal emergencies.
3. To provide counselling & knowledge regarding family planning methods & perform Medical termination of pregnancy.
4. To organize & implement maternal components in the “National Health Programs”.
5. With adequate surgical skills to manage common Obstetrical & Gynaecological problems.
6. With adiquate knowledge in medical genetics – Elementary genetics as applicable to obstetrics.
7. With skills in management of Normal & Abnormal pregnancy during Antenatal, Intra-natal & Post-natal period,
8. With adiquate knowledge of Gynaecological Endocrinology & Infertility .
9. With knowledge of Benign & malignant Gynaecological disorders.
10. With knowledge of Operative procedures including Endoscopy (Diagnostic & therapeutic) & its related complications.

11. With knowledge of interpretation of various laboratory investigations & other diagnostic modalities in Obstetrics & Gynaecology.
12. With knowledge of Medical & Surgical problems and Anaesthesiology related problems in Obstetrics &Gynaecology.
13. With knowledgeof essentials of Paediatric & Adolescent Gynaecology.
14. With knowledgeof Reproductive Medicine &, Family Welfare.
15. With knowledge of STD, AIDS & Government of India perspective on women's health related issues.
16. Who demonstrate skills in documentation of case details and of morbidity & mortality data relevant to the assigned situation.
17. With knowledgeof medico legal aspects in Obstetrics & Gynaecology.
18. Who keep abreast with advances in the field of Obstetrics & Gynaecology.
19. Who facilitate learning of medical / nursing students, para-medical health workers as a teacher trainer.
20. Who Demonstrate empathy & humane approach towards patients and their families.
21. Who can function as a productive member of a team engaged in health care, research &education.
22. Who practice OBG ethically and in step with the principles of primary health care.
23. Who demonstrate sufficient understanding of the basic sciences relevant to Obstetrics & gynaecology.
24. Who can identify social, economic, environmental, biological and emotional determinants of health, and take them into account while planning therapeutic, rehabilitative, and preventive measure/strategies.
25. Who should develop compassionate attitude towards patients and should have an aptitude to give palliative care for patients who are suffering from end stage disease.
26. Who can diagnose and manage majority of the conditions in OBG on the basis of clinical assessment, and appropriately selected and conducted investigations.
27. Who can plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability.
28. Who develop skills as a self- directed learner, recognise continuing education needs; select and use appropriate learning resources.
29. Who demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As per clause 2.10.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As per clause 2.10.

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

As per clause 2.10.

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University. This log book will be assessed by the postgraduate Guide of the student and will be jointly evaluated by the Guide & Head of the Department.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to within the first 6 months from the commencement of the course or as notified by the university in the calendar of events, to the Registrar.

Submission of dissertation

The dissertation shall be submitted to the Registrar (Evaluation) of the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

TEACHING PROGRAMME

❖ GENERAL PRINCIPLES

- Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training should be skills oriented.

- Learning in postgraduate program is essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are meant to supplement this core effort.

❖ **TEACHING SESSION:**

- Clinical case discussions:
- Bed side discussions
- Teaching rounds
- Seminars / Journal Club
- Statistical meetings: Weekly./ monthly
- Mortality meetings
- Interdepartmental Meetings : Paediatrics, Radiology
- Others – Guest Lectures / Vertical Seminars / Central Statistical Meets

❖ **TEACHING SCHEDULE:**

- Journal club — Once in 2 weeks
- Seminar/Symposium — Once a week
- PG case discussion/Bed side teaching — Twice a week
- Monthly Statistics & Intra-departmental meet (with all the staff, in-charge, residents & faculty) — Once a month
- Interdepartmental meet (Endocrinology, Medicine, Cardiology, Transfusion Medicine, Pathology, Microbiology, Gastroenterology, Anaesthesia) — Twice a month
- Perinatology meeting with department of Obstetrics and Gynaecology including statistics; discussing any neonatal death/topic — Once a month
- Thesis meet to discuss thesis being done by the PG residents — Twice a month
- Grand round of the wards — Once a week
- Interdepartmental meet with the Radiology department — Once a month

- Central session (CPC, guest lectures, integrated student seminars, grand round, sessions on basic sciences, biostatistics, research methodology, teaching methodology, health economics, medical ethics and legal issues).

Once a week

JOB RESPONSIBILITIES

1 OPD:

History & Work up of all cases and presenting the same to the consultants.

This includes all the special clinics including infertility, endocrinology, oncology, Menopause & adolescent clinic. Documentation in OPD Card, completion and maintenance of registers.

2-MINOR PROCEDURES

Aseptic Dressings / Stitch removal / Pap smear collection / Colposcopy / Cryo Cautery/ Electrocautery / HSG.

3- FAMILY PLANNING

Counseling for contraception / Sterilization / IUCD insertion / Removal.

4- INDOORS (IP): Pre rounds, emergency managements,Charting the case sheets,sending investigations,writing the discharge cards, daily/ more frequent monitoring of patients as appropriate, pre and post operative evaluation and care and procedures as required eg:-stich removal, I&D, etc.

5 -LABOUR–ROOMS / L-ROOM RECOVERY

- History & work up of all cases. Examination of all patients and documentation in the files.
- Sending investigations & filing investigation forms.
- Performing NST, Maintaining partogram in labouring patients.
- Monitoring vitals, uterine contractions and fetal heart rate in labouring patients, conducting deliveries,
- Episiotomy stitching and neonatal resuscitation.
- Monitoring 4th stage of labour
- I/V Line insertion, , Ryles Tube insertion, Catheterization, preparation of oxytocin drip,
- Instillation of misoprostol or Cerviprime foleys catheter, for induction of labour.
- Management of sick patients including those with Eclampsia, Abruption & PPH
- Assessment & shifting of sick patients to ICUs.
- Completion of files
- Preparation of discharge summary
- Preparation of weekly, monthly and annual statitics.

6 POST PARTUM & GYNAE WARD / RECOVERY

- Care of post partum patients
- Advise to post partum patients regarding breast feeding, immunization of baby & contraceptive advise to mother.
- History and workup of all Gynaecology cases, examination of all patients, sending investigations and filling forms
- Pre operative assessment and preparation of all patients before surgery
- Aseptic dressing, suture removal

7 OPERATION THEATRE

- Performing minor procedures like D&C, MTP, Endometrial biopsy, Cervical biopsy, Cryo-Cautery, Electro cautery etc.
- Assisting major procedures listed below

Minimum Number of Cases to be performed or assisted for MD students

- Caesarean section - 20
- Hysterectomy - Assisting – 20
  Performing – 5 Abdominal and 5 vaginal hysterectomies
- MTP – 20
- Postpartum sterilization -20
- Laparoscopic surgeries

2. 10 Content of each subject in each year

❖ **THEORY**

➢ **<u>OBSTETRICS:</u>**

- Gametogenesis fertilization, implantation and early development of embryo
- Anatomical and Physiological changes in female genital tract during pregnancy.
- Pharmacology of drugs used during pregnancy, Labour, Post-partum period.
- Development of placenta and membranes & placental functions
- Fetal skull and Maternal pelvis
- Diagnosis and differential diagnosis of pregnancy

- Anatomy of fetus, fetal growth & development, fetal physiology & circulation
- Immunology of pregnancy
- Pre-conceptional Care
- Antenatal Care
- Early pregnancy complications
- Normal labour & management
- Malpresentation & malposition
- Labour Dystocia
- Induction and augmentation of labour
- Antepartum Haemorrhage
- Complications of 2nd & 3rd stage of labour
- CPD & its management
- Obstetric Analgesia
- Multiple pregnancy
- Amniotic fluid
- PROM, Poly-Hydramnios, Oligo-Hydramnios
- Preterm labour &PPROM
- Fetal growth disorders
- Hypertensive disorders in pregnancy
- Medical disorders in pregnancy
- Infections in pregnancy.
- Special cases- Rh Negative, BOH, Obesity, post-dated pregnancy, Grand-Multigravida, Elderly primi, Previous CS
- Puerperium – Normal
- Abnormal Puerperium
- Emergency Obstetric Care (Intensive Obstetrics)
- Fetal Medicine
- Antepartum & intrapartum fetal monitoring.

- Obstetric operations
- Gynaecological disorders in pregnancy.
- Recent Advances in Obstetrics.
- Imaging in Obstetrics.
- Affections of Newborn
- Safe Motherhood, Epidemiology of Obstetrics, and evidence based care in Obstetrics, SDG, MDG, RCH Care, near miss mortality auditing Maternal mortality, perinatal mortality.

➢ **GYNAECOLOGY:**

- Anatomy of female pelvic organs.
- Development of female genital organs and congenital malformations
- Gynaecological evaluation.
- Physiology of menstruation, ovulation & menopause.
- Colposcopy & vaginal and cervical cytology
- Endometrial Hyperplasia, DUB, Abnormal bleeding.
- Fibroid uterus
- Endometriosis, Adenomyosis
- Endocrine abnormalities, Menstrual abnormalities Amenorrhoea, PCOD
- Lower genital tract infections
- Pelvic infections & Tuberculosis of the female genital tract
- Paediatric and Adolescent Gynaecology
- Disorders of Sex development
- Hirsutism, Hyperprolactinemia, Thyroid disorders.
- Infertility.
- Endocrinology related to reproduction
- Menopause
- Laparoscopy & Hysteroscopy.
- Benign & Premalignant lesions of vulva, vagina, cervix & endometrium

- Benign disease of ovary
- Ca vulva & vagina
- Ca Cervix
- Ca Endometrium
- Carcinoma Ovary & Fallopian tube
- Gestational Trophoblastic diseases
- Benign and malignant disease of the breast
- Genital Fistulae / Urinary Incontinence
- Prolapse
- Contraception / Family Planning / Sterilization methods
- Hormone therapies in gynaecology
- Recent Advances in Gynaecology
- Imaging in Gynaecology
- Preoperative & postoperative management

❖ **PRACTICAL**

OBSTETRICS:

Clinical examination of antenatal, intrapartum and post partum cases including palpation and eliciting various clinical signs.

P/S examination, P/V examination

- Venepuncture
- Amniotomy
- Conduct of normal Vaginal delivery
- Perineal infiltration & Pudendal block
- Episiotomy
- Ventouse delivery
- Forceps delivery
- Management of Genital tract injuries

- Inspection Cervix
- Lower Segment Caesarean Section
- Manual Removal of Placenta
- Breech vaginal delivery
- External Cephalic Version
- Delivery of twins
- Management of shock and post partum collapse
- Prevention and Management of Postpartum haemorrhage
- Cervical Cerclage
- Amnio-infusion
- Instillation of extra amniotic & intra amniotic drugs
- Non stress Test
- Suction Evacuation
- Dilatation & Evacuation
- Repair of complete perineal tear
- Repair of cervical tear
- Caesarean Hysterectomy
- Internal iliac artery ligation
- Uterine & Ovarian Artery ligation
- Destructive operations
- Reposition of inversion uterus
- Amniocentesis
- Infection control measures and waste management
- Rationale use of antibiotics

GYNAECOLOGY

- Pap Smear
- Wet smear examination
- Endometrial Biopsy
- Endometrial Aspiration
- Dilatation and Curettage/Fractional Curettage / Polypectomy

- Cervical Biopsy
- Cryo / Electrocautery of Cervix
- Hystero-Salpingography
- Diagnostic Laparoscopy & Hysteroscopy
- Opening & Closing of abdomen
- Operations for utero- vaginal prolapse
- Operations for Ovarian tumours
- Operations for Ectopic Pregnancy
- Vaginal Hysterectomy
- Abdominal Hysterectomy
- Myomectomy
- Colposcopy
- Loop Electro Surgical Excision Procedure
- Tuboplasties
- Pessary insertion
- Bartholin cyst excision
- Paracentesis
- Culdocentesis
- Endoscopic Surgery (Operative Laparoscopy & Hysteroscopy)
- Repair of genital fistulae
- Operations for Urinary incontinence
- Radical operations for Gynaecological Malignancies
- Vaginoplasty
- Intrauterine insemination
- Basic ultrasound / TVS
- Hydrotubation
- Vulval Biopsy
- Incision & drainage
- Preoperative and post operative management.
- FNAC

- Ovum pick up and embryo transfer.

FAMILY PLANNING:

- Intra Uterine Contraception Device Insertion / removal
- Female sterilization (Post Partum & Interval) (Open & Laparoscopic)
- MTP
- Male Sterilization
- Hormonal contraception

2.11 No: of hours per subject

As per clause 2.10

2.12 Practical training

POSTINGS

ROTATION OF DUTIES:

1st years- acquiring theoretical knowledge in OBG, observer ship and assistance of practical OBG.

2nd yrs -Practical training under supervision.

3rd years-Performing under supervision

Each resident is rotated in the general wards of each unit, Labour room, Family Planning, Specialty postings (Anesthesia, Radiotherapy, Urology, Radiodiagnosis, and NICU) as follows:

1. General ward: in rotation in all units
2. LR: 3 postings- 3 months per year for MS OBG .
3. Speciality postings: 2 weeks each in Radiotherapy, Radiodiagnosis, Urology, Anaesthesia, general surgery for MS during second year
4. NICU- 4 weeks posting for MS, 2 weeks for DGO
5. Family Planning: 2 months for MS,1 month for DGO

ROTATION IN SPECIALITY CLINICS: weekly once for 3 months

- Menopause clinic
- Infertility clinic
- Vesicular mole clinic
- Adolescent clinic

- High Risk pregnancy Clinic
- Post Natal Clinic
- Cancer Clinic
- Infertility Clinic
- Gynae Endocrine Clinic
- Family Planning Clinic
- Trophoblastic clinic

1. Emphasis should be self-directed learning, group discussions, case presentations & practical hands on learning.

2.Student should be trained about proper history taking, clinical examination, advising relevant investigations their Interpretations and instituting medical surgical management by posting the candidates in OPD, specialty clinics, wards, operation theatres, labor room, family planning clinics & other departments like neonatology, radiology, anesthesia. The candidates must be trained to manage all emergency situations seen frequently.

2.13 Records

Log book to be maintained and submitted

2.14 Dissertation: AS per Dissertation Regulation of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students except Diploma students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

The student will identify a relevant research question; (ii) conduct a critical review of literature; (iii) formulate a hypothesis; (iv) determine the most suitable study design; (v) state the objectives of the study; (vi) prepare a study protocol; (vii) undertake a study according to the protocol; (viii) analyze and interpret research data, and draw conclusions; (ix) write a research paper.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for

the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will lose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

As per clause 2.12.

2.16 Project work to be done if any

Not applicable

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

- **OBSTETRICS**

- Holland and Brews Manual of Obstetrics .
- Williams Obstetrics
- Practical guide to High Risk Pregnancy and delivery – Arias Fernando
- MunroKerr Operative Obstetrics

Dewhurst's Text book of Obstetrics and Gynaecology . Ian Donald's Practical Obstetric Problems

- Steven G Gabbe - Obstetrics Normal and Problem pregnancies - 5th edition
- James -High Risk Pregnancy- Management Options – 4th Edition
- Clinical Obstetrics – by Mudaliar

- **GYNAECOLOGY**

  - William's gynaecology
  - Shaw's Text book of Gynaecology
  - Novak's Gynaecology

- Jeffcoate's Principles of Gynaecology

2.19 Reference books

➢ **OBSTETRICS**

- Medical Disorders in Pregnancy by Barnes
- Medical Disorders in Pregnancy by FOGSI
- Care of the Newborn 6th ed. Meharban Singh
- Obstetrics and Gynaecology 5th ed. Krishna Menon Sauerberi E.E
- USG in Obst. & Gynaecology by Callens
- USG in Obst. & Gynaecology by Kuldeep Singh
- Medico legal aspects in Obst. & Gynae – Mukherjee GG
- Clinical Obstetrics – by Mudaliar
- Text book of Obstetrics by Sudha Salhan
- Medical Disorders in obstetric Practice by Deswiet's

➢ **GYNAECOLOGY**

- Te Linde's Operative Gynaecology
- Bonney's Gynaecological Surgery 10th ed
- Shaw's Operative Gynaecology
- Practice of fertility control 7th ed. – Chaudhary S.K.
- Text book of Gynae contraception 14th ed. C.S. Dawn
- Infertility – R. Rajan
- Clinical gynaecological endocrinology and infertility, Speroff – Leon
- Year book of Obst. & Gynae
- Principles & Practice of Colposcopy by B. Shakuntala Baliga
- Laparoscopy & Hysteroscopy by Sutton
- Hormone replacement Therapy by White Head M.
- Gynae & Obst. Procedures – Parulikar S.V.

- Surgery in infertility & Gynaecology – Jain Nutan
- Principles & Practice of Colposcopy – Balya B.S.
- Infertility Manual – Rao Kamini A.
- Operative Laparoscopy – Soderstrom R
- Chemotherapy of Gynaecological Malignancies - Borker C
- Textbook of gynaecology- Pressana kumari

2.20 Journals

- Indian Journal of Obstetrics & Gynaecology
- British Journal of Obstetrics & Gynaecology
- American Journal of Obst. & Gynae
- Clinics of North America
- Recent Advances in Obst. & Gynaecology by John Bonnar
- Progress in Obst. & Gynae by Studd.
- Clinical Obst. & Gynaecology
- Obstetrics and gynaecological Survey.
- Fertility Sterility journal
- The obstetrician And Gynaecologist-TOG
- International journal of clinical epidemiology

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not

merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation/thesis and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years and for Diploma at the end of 2nd academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Theory 400 marks

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
2	Paper II	100	40										
3	Paper III	100	40										

4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Duration – 3 hours each paper

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

Paper 1: Basic sciences as related to Obstetrics & Gynaecology

Paper 2: Obstetrics including diseases of Neonates

Paper 3: Principles and Practice of Gynaecology and Gynecological Pathology

Paper 4: Recent Advances in Obstetrics & Gynaecology

3.6 Model question paper for each subject with question paper pattern

Paper-I Basic sciences as related to Obstetrics & Gynaecology

Max. Marks: 100 Time: 3 hrs

Attempt ALL questions
Answer each question & its parts in SEQUENTIAL ORDER
ALL questions carry equal marks
Illustrate your answer with SUITABLE DIAGRAMS

1. Describe the Hematological changes during Pregnancy
2. What are the causes of Galactorrhoea. Discuss the management of Microprolactinoma in 20yrs old infertile patient & in pregnancy.
3. Enumerate the causes of vault Prolapse. How will you manage vault prolapse
4. Clinical application of vaginal cytology in pregnancy.
5. Describe the Prenatal diagnosis of chromosomal anomalies in a fetus.
6. What is the use of Methotrexate in Obstetrics & Gynaecology?

7. Give an account of changes in fetal circulation immediately after the birth of baby.
8. Enumerate applications of colour doppler in obstetrics and describe the findings of colour doppler in placental insufficiency
9. Aim & objectives of P N D T Act. Enumerate the clauses for 2nd trimester abortions.
10. Discuss the management of 23 yrs Primi at 34 weeks gestation presenting with tonic clonic convulsions.

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Paper-II Obstetrics including diseases of Neonates

Max. Marks: 100 Time: 3 hrs

Attempt ALL questions
Answer each question & its parts in SEQUENTIAL ORDER
ALL questions carry equal marks
Illustrate your answer with SUITABLE DIAGRAMS

1. Give the classification of hypertension in pregnancy. Describe the patho-physiological changes in pre eclampsia
2. Discuss the Laparoscopic management of Ectopic pregnancy
3. Discuss management of Primigravida with RHD with MS with grade II dyspnoea with fever at 30 weeks of gestation.
4. What are the criteria for the diagnosis of Residual Trophoblastic disease. Discuss its management.
5. Describe the selection criteria and explain the intrapartum monitoring of vaginal birth after caesarean section.
6. What are the causes of occipito-posterior position. Discuss its management in second stage
7. Explain the medical and surgical measures for prevention of parent to child transmission of HIV infection.
8. How will you manage a 10 days postpartum lady presenting with swollen left leg.

9. What are the indications of medical & surgical fetal therapy.
10. Give an account of the management of an Rh isoimmunized newborn.

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Paper-III Principles and Practice of Gynaecology and Gynecological Pathology

Max. Marks:100 Time: 3 hrs

Attempt ALL questions
Answer each question & its parts in SEQUENTIAL ORDER
ALL questions carry equal marks
Illustrate your answer with SUITABLE DIAGRAMS

1. Enumerate types of epithelial ovarian tumors. Discuss principles of management of epithelial ovarian tumor stage IIIc.
2. Give a detailed account on follow up of CIN 2.
3. Describe the tests of ovulation
4. Explain medical management of endometriosis
5. What are the secondary changes and complications of fibroid uterus. Discuss the role of uterine artery embolisation in management of fibroids.
6. Enumerate the supports of uterus. Discuss the management of third degree UV prolapse.
7. What are the types of DUB. How will you manage a case of puberty menorrhagia.
8. How will you evaluate a case of post menopausal bleeding?
9. How will you manage a case of misplaced IUCD ?
10. What are the natural defense mechanisms of vagina against infection. Discuss bacterial vaginosis.

****

Paper-IV Recent Advances in Obstetrics & Gynaecology

Max. Marks: 100 Times: 3 hrs

Attempt ALL questions
Answer each question & its parts in SEQUENTIAL ORDER
ALL questions carry equal marks
Illustrate your answer with SUITABLE DIAGRAMS

1. Discuss the use of misoprostol in labor induction & abortion.
2. Describe management of atonic PPH in 25 years old female
3. Discuss management of Hirsutism in 22 year old girl with PCOD.
4. Discuss recent advances in surgical & medical management of DUB.
5. Give WHO criteria for Semen Analysis ? How will you treat a 28 years old male with oligo-terato-asthenozoospermia
6. Describe various criteria for breech vaginal delivery
7. Discuss the management of post menopausal osteoporosis in 55 years old lady.
8. Management of IUGR at 28 weeks of gestation in G2 P1 L1 A0 S0.
9. Enumerate sex cord tumors. How will you manage a 22 year old girl presenting with such tumors.
10. Discuss causes, Pathophysiology diagnosis & treatment of HELLP Syndrome

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical examinations

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Clinical / Practical 300 marks

Obstetrics

long case 1(100 marks)

Short case 1 (50 marks)

Gynecology

Long case 1(100 marks)

Short case 1(50 marks)

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

Viva voce: 80 marks

Log Book: 20 marks

Total: 100 marks

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc.

Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerned institution.

REGULATIONS 2016

Syllabus

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD PHYSIOLOGY

Course Code 221

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Physiology

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.

- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.

- Who shall be aware of the contemporary advance and developments in the discipline concerned.

- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.

- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

COURSE CONTENT

The students would be working in the department for 3 years. So proper time plan can be done on the course content. Teaching sessions will be held in the form of seminars, journal clubs, microteaching, tutorials and discussions.

1) Theory:

- To attend the U.G. lectures
- To attend P.G. lectures at other P.G. Centres.
- To conduct microteaching sessions

• To teach theory topics for U.G. Students.

2) Practicals:

•To attend the practicals and demonstrations taught by senior teachers for U.G Students and later all practicals to U.G. Students.

•To perform amphibian and mammalian experiments, inclusive of basic technique s of handling of laboratory animals, anaesthia, dissection and instruments.

3) To learn evaluation techniques

•To learn in in detail the teaching learning methods and the methods of evaluation in practicals and theory should be able to take a class using audiovisual aids right from blackboard and chalk to that with laptop and multimedia session

4) Research:

•To attend Journal club / seminars.

•Visits to library to get acquainted with scientific journals

•To carryout thesis work & to learn basic topics in statistics.

•To attend meeting organised by clinical departments. •To attend local and national conferences

5) Exposure to Medical Education Technology Workshops.

•Should learn to use all audiovisual aids

6) Thesis

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Postgraduate teacher; the project shall be written and submitted in the form of a thesis. Every candidate shall submit thesis plan to the university with in the time frame set by university. The student will identify a relevant question; (ii) conduct a critical review of literature; (iii) formulate a hypothesis; (iv) determine the most suitable study design; (v) state the objectives of the study; (vi) prepare a study protocol; (vii) undertake a study according to the protocol; (viii) analyse and interpret research data, and draw conclusions; (ix) write a research paper.

8) Log book

Every candidate shall maintain a log book.

9) Assessment

Each PG student is to be assessed daily for their academic activities and also periodically. The assessment shall be – Valid, objective and reliable cover cognitive, psychomotor and affective domains formative, continuing and summative conducted in theory as well as practicals/clinicals.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years. The course should be successfully completed within double the duration of the stipulated period of the course.

2.6 Syllabus

- **Paper I** - General Physiology, Neuro Physiology, including Special Senses and Endocrinology including Reproductive Physiology
- **Paper II** - Systemic Physiology (Hematology, CVS, GIT, Respiratory System, Renal Physiology)
- **Paper III** - Physiological Chemistry, Biophysics and Radiation Biology
- **Paper IV** – Applied Physiology including Recent Advances

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

Not applicable.

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees / shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.
- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

Posting

- The postgraduate student will rotate through allied clinical departments such as Biochemistry, Pathology, Transfusion Medicine, General Medicine, Pulmonary Medicine, Cardiology, Neurology, Endocrinology and Nephrology during the second year.
- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.
- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work done in Histology and Gross Anatomy with an emphasis on Cross sectional Anatomy has to be maintained by the candidate and duly scrutinized

and certified by the head of the department and to be submitted to the external examiner during the final examination.

3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

2.10 Content of each subject in each year

Theory

General Physiology

Introduction to Physiology
Principles of Homeostasis
Structure of cell membrane, Intercellular communications
Mechanisms of Transport across cell membrane
Body Fluid compartments
Blood volume
Apoptosis and aging

Hematology

Blood - Functions, composition, Properties
Plasma proteins
Red Blood Cells
Morphology, composition, functions, normal RBC count and variations, properties
Haemoglobin – structure, normal content, functions, types, abnormal Hb
Erythropoiesis – sites (intra and extrauterine) different stages,
Factors influencing and regulating Erythropoiesis
Life Span of RBC and its destruction, jaundice
Anaemias – definition, classifications (etiological, morphological), physiological basis of anaemias, investigations
Bone marrow study – Importance, myeloid: erythroid ratio
White Blood Cells:
Classification, morphology, lifespan
Properties and functions
Normal total and differential count, variations
Leucopoiesis
Immunity
Definition, Types – innate and acquired, Humoral and cellular
Mechanisms of immune response, plasma cell, immunoglobins,
Autoimmune disorders, AIDS

Platelets:
Morphology, properties and functions, normal count, variations, thrombopoesis, and factors influencing this Reticuloendothelial system
Haemostasis
Primary (vasospasm, platelet plug formation) and
Secondary (extrinsic and intrinsic mechanisms of coagulation of blood)
Clot retraction
Anticlotting mechanisms in vivo
Anticoagulants - used in lab and in vivo
Bleeding disorders
Tests for bleeding disorders
Thrombosis and Embolism
Blood groups
ABO and Rh systems, inheritance, differences, Bombay group,
Landsteiner's laws I and II
Other minor blood groups, bombay blood group
Blood grouping and cross matching, concept of universal donor and recipient
ABO and Rh incompatability
Management and preventive measures, Medicolegal and clinical importance
Blood banking and transfusion
Blood transfusion – indications, precautions and complications
Blood Banking –anticoagulants used, storage, changes during storage
Transfusion of blood components – with special reference to recent advances
Lymph – formation, circulation, functions
Tissue fluid – formation, circulation and functions
Starling's hypothesis – edema formation

Cardiovascular system

Functional anatomy of heart and blood vessels
Properties of cardiac muscle
Conducting system of heart
Parts of conducing system, origin and spread of cardiac impulse,
Abnormal pacemakers, conduction defects
Cardiac cycle:
Definition, phases, events of cardiac cycle
Volume and Pressure changes – in different chambers and major vessels
Heart sounds – causes, character, murmur (definition, physiological basis)
Arterial Pulse - genesis, characters of normal pulse, common abnormalities
Venous blood flow- Venous tone, valves, factors affecting
Correlation between different events of cardiac cycle
Non invasive investigations in cardiology
ECG

Definition, Principles of recording of ECG
Leads
Normal tracings in all leads
In Lead II – normal waves, intervals and segments, how HR is determined, correlation with action potential and phases of cardiac cycle
Clinical uses of ECG
Abnormal ECG pattern in myocardial infarction, cardiac arrhythmias
Effect of changes in ECF K+, Ca++ and Na+
Conduction defects
Cardiovascular Regulatory Mechanism
Heart rate
Cardiac output:
Definition, normal values, variations
Method of measurement
Regulation of cardiac output
Correlation of normal ECG pattern with events of cardiac cycle in a diagram
Haemodynamics
Functional organisation correlated with structure of vascular system
General principles including physical laws governing flow of blood in heart and blood vessels
Pressure – resistance - flow relationship
Laminar flow, turbulent flow, Reynold's number, critical closing volume
Importance of peripheral resistance, venous circulation, venous tone
Regulation of blood flow – local and general
Arterial Blood pressure
Systolic and diastolic pressures– definition, normal values, variations
Define end pressure and lateral pressure, Bernoulli's principle
Pulse pressure, Mean arterial pressure
Determinants of Systolic and diastolic pressures - Measurement
Regulation - neural and humoral (short term, intermediate and long term)
Local regulation including auto regulation of blood flow, vasoconstrictors and vasodilators, substances secreted by endothelium
Effects of gravity, Posture and Exercise on B.P
Hypertension & hypotension
Regional circulations
Circulatory shock
Types, pathophysiology, stages, compensatory mechanisms
Cardio-vascular adjustments in health exercises and disease

Respiratory System
Introduction
Organisation and functional anatomy of respiratory system
Functions of different parts of respiratory system including non-respiratory functions

Mechanics of respiration
Surfactant
Law of laplace – application
Measurement of pulmonary ventilation
Lung volumes and capacities
Ventilation – pulmonary and alveolar
Dead space – Anatomical & Physiological
Pressure – volume relation ship
Elastic behaviour of lungs, total and lung compliance
Airway resistance, work of breathing, factors affecting bronchial tone,
Pulmonary blood flow
Volume, pressure, factors influencing, unique features.
Ventilation – perfusion ratio and its importance
Pulmonary gas exchange
Composition of inspired air, alveolar and expired air, partial pressures gas composition of arterial and venous blood
Mechanism of gas exchange
Structure of blood gas barrier, factors affecting diffusion across respiratory
Membrane diffusion capacity
O2 transport in blood
O2 dissociation curves
Co2 transport in blood
CO2 dissociation curve
Neutral control
Chemical control
Interactions between these chemical stimuli
Hypoxia
Definition, types, clinical features, differences
Oxygen therapy
Cyanosis, asphyxia and dyspnoea
Definition, CO poisoning
Periodic breathing
Cheyne – stokes and biots breathing, voluntary hyperventilation
Environmental Physiology
High altitude, rapid ascent, mountain sickness, acclimatization
Effects of UV rays, dysbarism
Effects of increased barometric pressure
Nitrogen narcosis, High pressure nervous syndrome, Oxygen toxicity
Decompression sickness (Caissons disease)
Pulmonary function tests
Artificial respiration
Mouth to mouth, Holger-Neilson method, mechanical methods, ventilators

Gastrointestinal System

Introduction to G.I. Physiology
General organization of G.I. tract
Neural control of G.I function, enteric nervous system
Mechanism of enzyme secretion by glands in general
Salivary glands
Functional anatomy (types and location) with relevant histology
Saliva
Composition, functions, control of secretion
Conditioned and unconditioned reflexes
Disturbances in salivary secretion
Gastric secretion
Functional anatomy of stomach and different gastric glands
Gastric juice: Composition, functions, phases of secretion and regulation
Gastric HCl secretion - mechanism and regulation of secretion
Gastrin – functions and regulation of secretion
Mucosal barrier, pathophysiology of peptic ulcer
Pancreatic secretion -- exocrine Pancreas
Functional anatomy with relevant histology
Pancreatic juice: Composition, function, and regulation of secretion
Applied importance
Liver and gall bladder
Functions of Liver, Functional anatomy with relevant histology
Composition and functions of bile, control of secretion
Functions of gall bladder
Enterohepatic circulation, Jaundice
Small intestine
Functional anatomy with relevant histology
Composition, regulation of secretion, and functions of intestinal juice
Small intestine – Functions
Movements of G.I. tract
Electrophysiology of smooth muscle in the GIT
Peristalsis
Mastication
Deglutition
Gastric motility – types, regulation, abnormal movements (vomiting, diarrhoea)
Gastric emptying – duration, factors affecting
Movements of small intestine
Large intestine
Functions – secretory, motor, absorptive, synthesis of short chain fatty acids
Defecation reflex
Role of dietary fibre, bacterial flora

Renal Physiology
Introduction
Functions of kidney – homeostasis, as an endocrine organ
Functional anatomy of Kidney
Renal circulation
Juxtaglomerular apparatus
Glomerular filtration
Clearence values
Tubular functions
Tubular reabsorption
Water, Sodium, glucose, water, urea, electrolytes - sites, mechanisms involved
Tubular secretion
Filtered load, Tubular maximum, glomerulo tubular feed back, and renal threshold
Acidification of urine
Concentration of urine
Counter current system – multiplier, exchanger
Cortico medullary gradient, Osmotic gradient along renal tubules
Diuresis
Micturition
Functional anatomy of bladder and innervation of bladder,
Filling and emptying of bladder, Cystometrogram
Micturition reflex and its higher control, voluntary control
Abnormalities of micturition
Urine
Normal volume, constituents
Abnormal constituents – albuminuria, glucosuia
Polyuria, Oliguria, Anuria
Dialysis – artificial kidney
Renal function tests

Skin and Temperature regulation
Structure and function of skin
Methods of heat conservation and loss in human body
Regulation of body temperature
Hyperthermia, Fever, Heat stroke, hypothermia, cold injuries (frost bite)

Nerve – Muscle Physiology
Excitable tissue
Definition, properties
Neuron
Structure of a typical neuron, types, properties, functions
Stimulus
Definition, types – threshold, subthreshold, suprathreshold

Nerve fibres
Types, classification, and functions
Resting membrane potential
Nerve action potential
Transmission of nerve impulses
Peripheral nerve injury
Neuromuscular junction
Functional anatomy, transmission of impulses across neuromuscular junction
Neuromuscular blocking drugs
Applied clinical aspects

Muscles

Classification

Skeletal muscle

Structure including molecular details
Action potential
Molecular basis of muscle contraction
Types of muscle contraction
Muscle types – fast and slow
Energy sources and metabolism in muscle at rest and during contraction
Muscular changes during exercise
Length –tension relationship
EMG
Fasiculation, fibrillation

Cardiac muscle

Structure, properties
Action potential
Pacemaker potential
Mechanism of contraction
Length – tension relationship

Smooth muscle

Types, Structure, innervation and neuromuscular junction
Potentials
Mechanism of contraction - Excitation – contraction coupling
Plasticity
Length – tension relationship

Nervous system

Organisation of nervous system
General organisation
Functional anatomy of brain and spinal cord
Brain – lobes, functions, Brodmann's areas
Neuron, neuroglia – functions

Spinal cord – Functional anatomy -
Cross section with location of sensory, motor and autonomic neurons and tracts
Cerebro spinal fluid
Ventricles of brain,Blood-brain barrier- importance
CSF – formation, circulation, composition, functions, Lumbar puncture
Synapse
Types
Functional anatomy of typical chemical synapse and synaptic transmission
Synaptic potentials
Properties of synapses
Synaptic inhibition
Neurotransmitters and neuromodulators
Reflex action
Definition, reflex arc - components
Classification with examples
Sensory receptors
Classification (recent view), types (phasic and tonic), properties - adaptation
Receptor potential, comparison with action potential
Sensations
Classification
Sensory tracts
Organisation of sensory pathways
Tracing of pathways from body and face
Pain Sensation – details
Different types of pain
Modulation of pain - Spinal level, supra spinal level
Visceral pain, referred pain, radiating pain, - clinical correlates
Altered pain sensations
Thalamus
Functional anatomy, nuclei – classification, connections, Functions of thalamus
Thalamic syndrome
Sensory Cortex
Location – primary area, secondary area, association areas
Salient histological features, Sensory homonculus
Lesions
Motor system
Introduction, levels of motor control
Reflex action
Definition, Reflex arc
Classification of reflexes with examples
Stretch reflex, inverse stretch reflex, reciprocal innervation, withdrawal reflex
Motor Cortex
Motor areas

Motor homonculus
Descending tracts
General organization, Pyramidal and extra pyramidal tracts, their functions
Upper motor neurons and lower motor neurons, therie lesions
Effects of lesions at various levels - hemiplegia, paraplegia, monoplegia
Spinal cord injuries
Injuries of spinal cord: complete transection, incomplete transection, hemisection, section of anterior and posterior roots, injury to motor nerve
Basal ganglia
Organization, Connections, Functions
Disorders
Cerebellum
Functional anatomy, Functional and evolutional divisions, functions
Deep cerebellar nuclei, connections in relation to functions, functions
Neuronal circuit
Cerebellar lesion
Reticular formation
ARAS, descending reticular system –explain control of muscle tone
Functions
Limbic system
Organization, connections and functions
EEG and sleep
Define EEG, principle of recording,
Normal waves , Clinical uses
Vestibular apparatus
Functional anatomy
Connections and Vestibular pathway, Functions
Muscle tone, posture, equilibrium
Basis of maintenance – stretch reflex, higher control,
Postural reflexes – mention with levels of integration (details not required)
Regulation of muscle tone and posture
Hypothalamus
Functional anatomy, Nuclei, connections and functions
Higher functions of the brain
Learning
Memory
Speech
Autonomic nervous system
Organisation and functions
Special Senses
Olfaction
Receptor, pathway, lesions
Taste

Taste buds, receptor, primary taste sensations, pathway, lesions

Vision

Functional anatomy of eye
Chambers of the eye, intraocular fluids,
Lens - characteristics, changes with age, aphakia, cataract
Retina – Histology, Macula lutea, fovea centralis
Basic optics
Optical system of the eye
Refractive media of eye
Concepts of reduced eye, Image formation on retina
Emmetropic eye, Far and near points
Accommodation and accommodation reflex (Near response) –
Errors of refraction, Presbyopia
Contact lenses
Visual receptors (cones and rods)
Structure in detail
Visual pigments, role of vitamin A
Phototransduction
Adaptations of visual receptors - Dark adaptation and light adaptation
Electrophysiology of receptors, receptor potential, lateral inhibition
Electroretinogram
Duplicit theory of vision, photopic and scotopic vision
Muscles of eye
Names, nerve supply and movements of eyeball
Corresponding points, double vision and squint
Colour vision
Primary, secondary and complementary colours
Hue, brightness and saturation
Receptors
Trichromatic and Opponent Process Theories
Colour blobs – location and function
Colour blindness
Afterimages, contrasts
Visual pathway
Mono ocular and binocular vision
Visual signals - Processing in the Retina
Pathway -Important features to be specified at all levels
Effects of lesion at different levels
Macular sparing (recent views)
Visual cortex – all areas and functions
Visual reflexes
Papillary light reflex (direct and indirect) - pathway, lesion)
Accomodation reflex – pathways, lesions

Corneal reflex - pathway
Tests of Vision -Field of vision, Visual acuity, Color vision

Audition

Acoustics – frequency, amplitude of sound, pitch, intensity, and quality of sound
Functional anatomy of the ear
Functions of external, middle and inner ear
Cochlea
Structure, Organ of corti,
Hair cell physiology, Mechano-electrical transduction by hair cells
Endocochlear potential
Descrimination of pitch (travelling wave theory) and intensity of sound
Auditory pathway
Sound localisation, pitch discrimination, masking of sounds
Deafness
Audiometry

Endocrinology

General endocrinology
Names and organisation of Endocrine glands in human body
Hormone – definition, and classification
Mechanism of action of hormones.
Control of secretion of hormones in general – the + ve and –ve feed back
Abnormalities of hormone function
Hormonal assay
Hypothalamus
Functional anatomy, Hormones, their physiological actions
Interrelationship between hypothalamus and pituitary glands –
Infundibulum -hypothalmo –pituitary tract and portal system
Pituitary gland
Functional anatomy, cell types
Hormones of anterior and posterior pituitary
Growth hormone - physiological actions and regulation of secretion, Hyper and hypofunction
Other hormones to be dealt with the target glands,
Mention intermediate lobe hormones - – pro opiomelanocortin and MSH
Thyriod gland
Hormones- biosynthesis, transport, physiological actions (physiologic, pharmacologic and pathologic) and regulation of secretion (H-P-T axis)
Thyroid function tests
Hyper and hypofunction in children and adults
Pancreas – endocrine
Functional anatomy, Hormones- physiological actions and regulation of secretion
Hyper and hypofunction
Insulin - receptors and insulin resistance

Glucagon, Somatostatin, Pancreatic polypeptide
Adrenal gland
Adrenal Cortex
Functional anatomy
Hormones of adrenal cortex - glucocrticoids, mineralocorticoids, sex steroids
Biosynthesis, transport, physiological actions and regulation of secretion
Hyper and hypofunction
Adrenal medulla
Hormones (catecholamines) , regulation of secretion, clinical aspects
Calcium homeostasis
Normal calcium metabolism
PTH, calcitonin and vitamin D - target organs and physiological actions
Hypocalcemia and tetany
Other endocrine glands
Kidney, Pineal body, Thymus, White adipose tissue, Heart, endothelium
Local hormones
Sources and physiological actions
Physiology of growth and development
Correlation of actions of different hormones from infancy, childhood, puberty and Adulthood

Physiology of Reproduction

Introduction
Sex organs, genetic basis of sex
Sex differentiation and development of Reproductive system
Factors influencing development of genitalia
Aberrant sexual differentiation
Chromosomal developmental
Puberty – normal, precocious and delayed puberty
Male reproductive system
Functional anatomy
Functions of testis – endocrine, Spermatogenesis
Abnormalities of testicular function
Erection, ejaculation, composition of semen, sterility
Female reproductive system
Functional anatomy
Ovary - oogenesis, ovulation, corpus luteum,
Ovarian hormones, Control of ovarian functions by H- P- Gonadal axis
Pituitary gonadotropins (FSH, LH)
Menstrual cycle
Phases, Ovarian, uterine and vaginal changes during menstrual cycle
Hormonal regulation
Abnormalities of ovarian function
Menarche, menopause, Castration before and after puberty

Pregnancy
Fertilisation, implantation, Corpus luteum of pregnancy
Placenta – functions, Placental hormones
Foetoplacental unit
Pregnancy tests
Parturition – physiology of labour
Lactation
Hormones influencing and their actions
Contraception
Temporary and permanent methods in males and females, and their physiological basis

DETAILS OF PRACTICALS

Human Physiology

1. Use and care of microscope and microscopic examination of blood
2. PCV, ESR, osmotic fragility
3. Haemoglobin estimation and blood indices
4. RBC count
5. WBC count
6. Examination of peripheral blood smear
7. Differential WBC count – normal, abnormal, anaemias
8. Platelet count
9. Reticulocyte count
10. Absolute eosiniphil count
11. ABO grouping, Rh typing
12. Bleeding time, clotting time
13. Recording of BP – effects of posture and exercise
14. Recording of arterial pulse
15. Respiratory movements
16. General examination
17. Examination of Respiratory system
18. Examination of CVS
19 Examination of higher functions and sensory system
20 Examination of Motor system
21. Examination reflexes
22. Examination of cranial nerves

Experimental physiology

1. Appliances in experimental physiology Laboratory including physiograph
2. Pithing, muscle nerve preparation, mounting, effects of different types of stimuli
3. Simple muscle twitch

4. Two successive stimuli, repetitive stimuli and fatigue
5. Genesis of tetanus and Starling's law of muscle
6. Effect of load and after load on muscle contraction
7. Effects of variations of temperature on muscle contraction
8. Velocity of nerve impulse
9. Normal cardiogram of frog's heart and effects of heat and cold.
10. Effect of temperature on frog's heart
11. Refractory period of frog's heart
12. Stannius ligatures. Properties of cardiac muscle – all or none law, treppe, summation of subminimal stimuli (demonstration)
13. Effect of vagal stimulation on frog's heart
14. Perfusion of frog's heart – action of ions, action of drugs

(Demonstration through e-modules/recorded graphs)

Mammalian experiments

1. Heart perfusion
2. Intestinal movements Biopotentials on

- Osciloscope
- Electro encephalogram (EEG)
- Electromyogram (EMG)
- Electro Cardio Gram (ECG)
- Audiometry
- Perimetry
- Spirometry

2.11 No: of hours per subject

As per clause 10 of the curriculum.

2.12 Practical training

Day – 1 – 9 AM to 4 PM

Clinical Physiology		Marks 130	Time
	A. Examination of Systems. Problem based question to be analyzed and examine the	80	3 hours

	respective system in a normal subject followed by discussion.		
	B. Human experiments. Perform the test, Record & Interpret the findings. (ECG, EMG, SPIROMETRY, STETHOGRAPHY, PERIMETRY, ERGOMETRY, PHYSIOGRAPH, AUDIOMETRY……etc	20	
	C. Interpretation of Clinical data/Problem solving exercise--- Clinical history, Lab investigation reports-Normal/Abnormal.(3nos of 10 marks each)	30	
Spotters	Ten(10) stations of 5 minutes & 5 marks each **1.** Calculation.(PG Level) **2.** Interpretation of Graphs pertaining to clinical conditions (EEG, ECG of MI, Spirogram of Obstructive Lung disease…etc.,). **3.** Drawing Labelled Dagrams.(Nephron with function/histology of segments, Events of cardiac cycle …etc.,) **4.** Interpretation on Clinical conditions based on questions provided(Hemiplegia, Parkinsonism, Myaesthenia gravis….etc.,) **5.** Interpretation of Clinical data with reference to Clinical	50	1 hour

	postings. (Dialysis. EEG, Audiometry, Evoked potentials,Cardiac catheterization, TMT, Echocardiography …etc.,) **6.** Instruments (In use pertaining to any/all experiments in Physiology) OR Images of Equipments in Clinical Physiology-(EEG, machine, ABG analyser..etc.,) **7.** Haematology questions based on Blood banking and Transfusion. **8.** Questions based on Research Methodology. 9 Identification of pictures/photographs- -clinical/radiological 10.Microscopic examination of Blood/Bone marrow(-Normal/Abnormal.)		
Haematology experiments.	Perform at least one Long and One Short hematology experiment each conclusive of diagnosis based on clinical history provided.(Long haematology -20 marks, Short haematology-10marks.)	30	1 hour
Experimental Physiology	Discussion & Evaluation using Graphs. **A.** Recorded graphs /Charts of Experiments on whole animal.	20	1 hour

	Record on BP, Respiratory movements, Perfusion of Heart, Effects of Drugs, Ions etc.,		
	B. Isolated Organ Experiments.(Skeletalmuscle / smooth muscle/Cardiac muscle)- Any one experiment-.Either Recorded graph or to Draw graph.	10	
NB: Animals are not sacrificed and recorded graphs are provided BUT the details of the experiments- Apparatus, Procedure Observations, Results etc., should be learned by the candidate and will be assessed			

Day 2 - 9 AM to 1 PM

Item	Details	Marks	Time
1.Pedagogy	**1.** Check list is appended – Appendix 1 **2.** Should be considered as a criteria for Pass **3.** Topic to be given by External examiner at the end of day-1	60	10 minutes per candidate(8min presentation, 2min discussion) Max time for 4-5 students -1hour
1. **Viva voce.**	To be conducted by all the four examiners	80	Approximately30-45 minutes per candidate.

	together.		
3.Log Book	Monthly submission &grading to be done by the Department. Final marks given after assessment by External & Internal Examiners.	20	

2.13 Records

As part of periodic assessment by the Department.

2.14 Dissertation: As per dissertation regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

Not applicable.

2.16 Project work to be done if any

As stipulated by the Head of Department from time to time.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

- Text book of Medical Physiology by Guyton & Hall
- Review of Medical Physiology by William F. Ganong
- Understanding of Medical Physiology by Bijlani

2.19 Reference books

- Physiological basis of medical practice by Best & Taylor
- Wintrobes clinical hematology
- Clinical neuroanatomy for medical students (Richard S Snell)
- Harrisons Principles of Internal Medicine
- Williams Text book of Endocrinology
- Bern & Levy Physiology
- Text book of Medical Physiology by Indu Khurana

2.20 Journals

- Annual Review of Physiology
- Indian Journal of Physiology & Pharmacology
- Journal of Applied Physiology
- Physiological reviews

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other

presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATION

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40										
2	Paper II	100	40										
3	Paper III	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

There shall be four theory papers. It consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

- Paper I - General Physiology, Neuro Physiology, including Special Senses and Endocrinology including Reproductive Physiology
- Paper II - Systemic Physiology (Hematology, CVS, GIT, Respiratory
- System, Renal Physiology)
- Paper III - Physiological Chemistry, Biophysics and Radiation Biology
- Paper IV – Applied Physiology including Recent Advances

3.6 Model question paper for each subject with question paper pattern

M.D. DEGREE EXAMINATION (PHYSIOLOGY) ….. 201..

Paper I - General Physiology, Neuro Physiology, including Special Senses and Endocrinology including Reproductive Physiology

Time: 3 hours Max. Marks: 100

I. Explain the basis of maintenance of tone of the muscle and the mechanism involved in Jendrassik's maneuver (20)

II. Write short notes on:

a) Auditory function tests

b) Radioimmunoassay

c) Physiological actions of cortisol

d) Non Insulin Dependent Diabetes Mellitus

e) Hypothalamic obesity

f) Dopamine

g) Reticular formation

h) Visceral pain (8 x 10 = 80)

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M.D. DEGREE EXAMINATION (PHYSIOLOGY) ….. 201..

Paper II - Systemic Physiology (Hematology, CVS, GIT, Respiratory System, Renal Physiology)

Time: 3 hours Max. Marks: 100

I. How urine is concentrated? Write the role of kidney in acid Base balance (20)
II. Write short notes on:

α) Compliance of lung

β) End diastolic volume

χ) Cytokines and their clinical relevance

δ) Achalasia cardia

ε) Voluntary control of respiration

ϕ) Entero endocrine cells

γ) Jugular venous pulse

η) Coronary circulation (8 x 10 = 80)

****

M.D. DEGREE EXAMINATION (PHYSIOLOGY) ….. 201..

Paper III - Physiological Chemistry, Biophysics and Radiation Biology

Time: 3 hours Maximum: 100 Marks

I. Give an account of the physiological processes involved in ageing. (20)

II. Write short notes on:

α) Microwave therapy

β) End plate potential

χ) Nernst equation

δ) Polymerase Chain Reaction

ε) Inverse Stretch Reflex

ϕ) Aquaporins

γ) Hydrocephalus

η) G Proteins (8 x 10 = 80)

****

M.D. DEGREE EXAMINATION (PHYSIOLOGY) ….. 201..

Paper IV – Applied Physiology including Recent Advances

Time: 3 hours Maximum: 100 Marks

I. Write in detail about goitre and thyroid function tests (20)

II. Write short notes on:

α) Heart block

β) Acute myeloid Leukaemia

χ) Colour blindness and tests to assess it

δ) Blood brain barrier

ε) Conn's syndrome

ϕ) Atherosclerosis

γ) Diarrhoea

η) Epilepsy and EEG findings (8 x 10 = 80)

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical /

Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Practical Scheme

Mark distribution for Practicals

Practicals - 300 marks including Pedagogy

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

i. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

ii. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

Viva voce - 80 marks

Log Book - 20 marks

Total – 100 marks

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

LIST FOR PEDAGOGY

NO	ITEM	MARKS	REMARKS
1.	**Lesson Planning** (Learning objective Organization and sequencing of material)	3	
2.	**Presentation & Management** (Eye contact, Pace& Volume, Clear articulation, Fluency, Clarity of points and explanation, Confidence, Transition.)	3	
3.	**Time management** (Adequate timing for presentation and discussion)	3	
4	**Audiovisual aids. (Black board, OHP, LCD)** (Appropriate use Neatness, Readability, Adequate size of letters, Spacing between words and lines, Colouring.)	3	
5.	**Beginning& Summarizing**	3	

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD FORENSIC MEDICINE

Course Code 222

(2016-17 Academic year onwards)

2016

2.COURSE CONTENT

2.1 Title of course:

M.D. Forensic Medicine

2.2 Objectives of course

GOAL

The goal of the teaching of postgraduate students in Forensic Medicine is to produce a competent specialist who:

A. Is able to provide basic and specialized services in relation to medico-legal responsibilities in the practice of medicine and process of crime investigation.

B. Must be capable of helping the authorities on right track in criminal matters and connected to medico-legal problems.

C. Should acquire the competency as a teacher, trainer, researcher and leader in the field.

D. Should acquire the knowledge of law in relation to practice of medicine, medical negligence and investigation of crime against human beings. They should know the codes of medical ethics and allied issues , national health policy and law of the land as a citizen of India

Objectives:

At the end of the course, the candidate should be able to:

A) Conduct a competent medico-legal autopsy, collect appropriate evidence pertaining to cause/mode/manner of death and identification of deceased and assailant. They must also be able to understand and interpret other important medico-legal aspects of death due to natural and unnatural conditions and poisonings.

B) Must visit the scene of crime as when necessary and shall detect, describe, interpret the observations and conclude the procedure in a technically competent manner.

C) Should have fundamental knowledge of all branches of medical disciplines related to the medico-legal applications. They must also be able to refer and understand relevant application of few other branches of science like botany, zoology, chemistry, and physics. It is also expected that they must be aware of using computer.

D) Must be aware of laws in relation to medico-legal work, medical practice and be acquainted with related relevant amendments and also related judgments passed by constitutional courts.

E) Understand the important procedures and applicability of the general principles of analytical toxicology, ballistics, and immunology, occupational and environmental hazards.

F) They are trained to serve as a future teacher, trainer, researcher and leader in the field of medico- legal work. They must also be able to offer technically competent consultancy services to the health, home and law departments in connection with medico- legal work, crime investigation process and as a witness in Court of Law

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As per clause 2.10.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years. However the maximum time for course completion is 6 years.

2.6 Syllabus

As per clause 2.10

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hour

As mentioned in clause 2.10

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the Chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty and also coordinate and monitor the implementation of these training Programmes.

  - The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (MCI) Inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University. This log book will be assessed by the postgraduate Guide of the student and will be jointly evaluated by the Guide & Head of the Department.

- The record books shall be checked and assessed monthly by the faculty members imparting the training.

- During the training for Degree to be awarded in the disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students, nursing students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco– economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

- The candidates are also expected to be aware of basics of medical education, teaching technology principles and use of audio-visual aids in the same. Candidates must actively participate in Post mortem Examination, Clinical Medico- legal cases, Laboratory work, Clinico-Pathological Conferences, Seminars, Journal Clubs, Group Discussions, Visit to Scene of crime, Court Evidence & Research work. The facilities offered by other Clinical & Basic Science Departments are made available to them.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each day's work has to be maintained by the candidate, which shall be submitted to the Head of the department for scrutiny on the first working day of each month.

2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.

3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

All the PG residents are assessed daily for their academic activities and also periodically.

General Principles :

The assessment is valid, objective, and reliable

It should cover cognitive, psychomotor and affective domains

Formative, continuing and summative (final) assessment should also be conducted in theory as well as practical/clinical. In addition, thesis is also assessed separately.

Formative Assessment- The formative assessment is continuous as well as end-of-term. The former is based on the feedback from the senior residents and the consultants concerned. End-of- term assessment is held at the end of each semester (up to the 5th semester). Formative assessment will not count towards pass/fail at the end of the program, but will provide feedback to the candidate.

Internal Assessment- The performance of the Postgraduate student during the training period should be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student.

Following areas also should be assessed

Personal attributes: **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations and in the positive approach.
Motivation and Initiative: Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.
Honesty and Integrity: Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.

Interpersonal Skills and Leadership Quality: Gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.
Leadership quality can be assessd by their ability to arrange different activities

Practical Work:

Availability: Punctual, available continuously on duty, responds promptly on assignments and takes proper permission for leave.

Diligence: Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, and competent in practical work.

Academic ability: Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.

Performance: Proficient in presentations and discussion during academic sessions in the department.

Academic Activity: Performance during presentation at Journal club/ Seminar/ Case discussion/ meeting and other academic sessions. Proficiency in skills as mentioned in job responsibilities.

- End of term theory examinations conducted at end of 1st, 2nd year and after 2 years 9 months.
- End of term practical/oral examinations after 2 years 9 months.

2.10 Content of each subject in each year

Theory :

- **Basic medical sciences namely Anatomy, Physiology, Pharmacology, Pathology and Microbiology as applied to Forensic Medicine**

- Surface land marks & regional anatomy of medico-legal significance.
- Comparative anatomical study of Male & Female skeleton.
- Anatomy of neck with special references to Violent Asphyxial deaths.
- Anatomy of reproductive organs
- Gross anatomy of heart and coronaries.
- Outline of embryonic / fetal development.
- Microscopic anatomy (histology, of different organs & tissues, such as brain, heart, lungs, liver, kidneys, spleen, thyroid, adrenals, bone, and skin)
- Body water & fluid balance.
- Blood grouping & Rh incompatibility.
- Physiology of menstruation & pregnancy.
- Physiology of thermo-regulation.
- Patho-physiology of shock.
- Blood sugar regulation in diabetic coma & hypoglycaemic coma.
- Outline of the functions of circulation, respiration, hemopoeitic, nervous, digestive, endocrine, excretory, reproductive and musculo-skeletal system. Patho-physiology of sexual functions including histopathology.
- General pathology: Pathology of cell / tissues – Degenerative changes & secondary changes, atrophy, hypotrophy, aplasia, hyperplasia, ischemia, necrosis, infarction, cloudy swelling, amyloidosis and embolism, asphyxial deaths, electricity, gun-shot wounds, poisoning, thrombo-embolism, fat embolism, aspirations, wound healing, histological determination of time of death.

- Body's local and systemic response to trauma.
- Healing and fibrosis (Pathology of scar)
- Common general and systemic diseases caused by physical/chemical agents.
- Disorders of infancy and old age changes relevant to Forensic Medicine.
- Pathology-gross and microscopic findings in myocardial infarction,congenital heart diseases, tuberculosis, cirrhosis, malnutrition, starvation.
- Histology with important Staining Procedures
- Microbiology and serology of venereal diseases infections.
- Microbiology of Cadavers.
- Relevant General Pharmacology, Pharmacology of Important Antidotes & Drugs of Addiction, Anti-sera, Hormones & Anaesthetic Drugs.
- Other clinical subjects as applied to Forensic Medicine.
- Identification of the living and dead, determination of race and religion, sex, age, external peculiarities, such as moles, birth marks, occupational marks, anthropometry, fingerprints, and foot prints handwriting etc. and their medico- legal aspects. Evaluation of evidence from the skeleton. Problems of reconstruction, and superimposition technique.
- Medico-legal aspects of allergy and anaphylaxia.
- Evidence from trace elements, like hair and biological stains of blood, semen, sweat, saliva, milk, sputum etc.
- Laboratory investigations as required in medico-legal situations, like unconsciousness, sudden death, unknown causes, therapeutic misadventures, industrial exposures and the like.
- Outlines of analytical and histopathological techniques as applied to forensic medicine.

- **Forensic Medicine**

- Injuries and Thermal deaths from cold, heat, electricity, lightning and radiation.
- Death from starvation.
- Mechanical injuries & their medico-legal aspects in relation to nature of injuries, accidental, suicidal, homicidal, and distinction between injuries caused during life and after death. Medico-legal examination of an injured person. Regional and Transportation injuries.
- Examination of weapon in relation to inflicted injuries.
- Mass disasters.
- Firearm injuries.

- Bombs and other explosives. Biological and chemical warfare and barotrauma.
- Causes of death from wounds.
- Forensic radiology in identification, pathology, dentistry, child abuse, trauma and medico-legal implications of radiological procedures.
- Forensic psychiatry: Various Acts in relation to Forensic psychiatry, Classification of mental disorders and abnormal human behaviours. Medico-legal aspects of insanity and abnormal human behaviour as regards to civil & criminal responsibilities and rules regarding admission, treatment and discharge of mentally ill person in the Mental Hospitals. Feigned insanity, Juvenile delinquency in the juvenile court. Restraint of mentally ill person.
- Biology of behaviour, emotion, stress, attitudes, normal & abnormal personalities.
- Psychological assessment & testing of personality and its disorders, abnormal psychology, health psychology and assessment strategies in medical education.
- Study of suicide, personality and circumstances. Postmortem analysis of suicide notes and its circumstances.
- Counselling in normal sexual behaviour and sex related disorders.
- Medico-legal aspects of emergency, resuscitation in intensive care
- Trauma, Work Stress & Disease.

  Torture medicine: Medico-legal aspects & duties of physician in cases of torture.
- Virginity, Pregnancy, Delivery in relation to suit of nullity of marriage, divorce, and legitimacy and affiliation cases etc.
- Abortion – Criminal & Justifiable, Laws in relation to criminal abortion. Duties of medical persons when called to treat a case of criminal abortion. MTP Act 1971.
- Impotence, Sterility, Artificial insemination, sterilization. Test tube babies & their medico-legal aspects.
- Sexual Offences – Rape, Incest, unnatural sexual offences, such as sodomy, Tribadism, Bestiality & Buccal Coitus, Sexual perversions.
- HIV and AIDS.
- Infanticide.

- **Toxicology**

- Forensic Toxicology & Medical Jurisprudence General & Forensic Toxicology including Classification, Mechanism of Action, Clinical Features, Diagnosis, Management, Autopsy appearances & Medico-legal Importance of Poisons.
- Addiction, de-addictions and drug abuse.

- Important Toxicological Analytical Techniques.
- Forensic Science: Recent Advances & Modern Trends.
- Introduction & working of various Wings of Forensic Science Laboratory - Immunology, Examination of biological trace material evidence, ballistics, Crime Laboratory, Forensic Photography.

Definition of Medical Jurisprudence:

- Introductory remarks, Criminal Courts & their powers, inquests and legal procedures, procedure in court, medical evidence, various medical certificates, medico legal reports, dying declaration & dying deposition, witness, conducts and duties of the doctor in the witness box, professional secrecy.
- Regulation of medical profession, various governing bodies, their constitution & functions. Laws in relation to medical man.
- Rights, duties & privileges of a registered medical practitioner.
- Informed consent in medical practice. Infamous conduct. Medical malpraxis.
- Physician duties under various public health & medical Acts.
- Problems of privileges and confidentiality etc. Physician in the Witness Box.
- Liabilities of Hospitals, nursing home and public dispensaries to patients.
- Medical practice in relation to Insurance.
- Relevant parts of Indian Penal Code, Criminal procedure, Indian Evidence Act, Immoral Trafficking Act, Workman's Compensation Act and other Laws related to medical practice.
- Law & Procedures related to Organ Transplantation.
- Legal & Ethical aspects of Family planning procedures.
- Therapeutic trial & human experimentation etc.
- Medico-legal aspects of Organ & Tissue transplantation.
- Euthanasia.
- Supreme Court and High Court, landmark judgments related to Forensic Medicine and Medical Jurisprudence
- Relevant Laws, Legal Procedures, Psychiatry & Medical Jurisprudence functions of MCI, Ethics & Bio-Medical Research, Consent, Negligence, Evidence & Recording of Evidence , Relevant Sections of IPC, Cr PC, IEA, Acts - CPA, MTP, PNDT, NDPS, Organ Transplantation , NHRC
- Medical certification of cause of death and relevant vital statistics.
- Day-to-day MLC problems in hospitals.
- Recent laws applicable to medical man.
- Value of medical opinion in the court of law.

Forensic Pathology including Forensic immunology & recent advances:

- Medico legal autopsy of dead body, decomposed and mutilated body or its fragments / skeleton, bones, exhumation & rules regarding it.
- Death, manner of death, modes of death, cause of death, sudden death, signs of death and changes following death. Estimation of postmortem interval, Forensic Entomology, Postmortem chemistry of body fluid like blood, CSF and vitreous humor, presumption of death and presumption of survivorship.
- Violent asphyxial deaths: Hanging, Strangulation, Suffocation and Drowning.
- Death from sudden violence, suspicious, unknown and unnatural cause, disease following trauma.
- Basic concepts of immunology and serology.
- Principles of various immuno-serological tests, precipitin test, pregnancy test, sperm antibody test.
- Role of immunological techniques in crime investigation and exclusion of parentage.
- Incompatibility and adverse reaction of drugs commonly used in therapy etc.
- Anaphylaxis and hypersensitivity reactions.
- Different types of teaching aids, methods of teaching & question paper formation of different types (MCQs, Structured, Short, and Essay types).
- DNA & Fingerprint system, Lie Detection & Polygraph, Narco-analysis.
- National Health policies.
- Routine and advanced Imaging Techniques and equipments.
- Basics of medical education technology and research methodology.
- Computer and its use and its applicability in the specialty.
- Medical auditing. Note: The project syllabus is minimal and may require further improvement from time to time as per requirements of MCI and the advances in the specialty of forensic medicine & toxicology.
- Life saving manoeuvres and pre-hospital first aid.
- Routine and advanced Imaging Techniques and equipments.
- Medico-legal record keeping.
- Basics of medical education technology and research methodology.
- **Topics are not limited to the above portions. Read and acquire as much knowledge as possible in all areas**

2.11 No: of hours per subject

As given under 2.10.

2.12 Practical training

1. Medico-legal autopsies.
2. Age estimation.
3. Medico-legal Injury report preparation.
4. Medico-legal examination of an Alcoholic and other drugs.
5. Medico-legal examination in cases of Sexual offences.
6. Medico-legal examination of Poisoning cases.
7. Psychiatric assessment of a patient.
8. Medico-legal examination of bones, weapons, clothing, wet specimens, and poisons.
9. Detection of common poisons in Toxicology Laboratory.
10. Medico-legal examination of Photographs.
11. Medico-legal examination of X-rays.
12. Laboratory examination of Biological trace material evidence.
13. Court evidence / attendance.
14. Awareness of various intensive care setups & operation theatre setups.
15. Awareness of medico-legal & crime laboratory instruments & equipments.
16. Attending CME/Workshops/Conference; involvement in UG Teaching.

2.13 Records

Record for daily activities to be maintained as per clause 2.21.

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be reevaluated by the University. If thesis is rejected by 2 experts, then also the candidate will lose one chance of appearing for the examination

and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

The postgraduate student shall rotate through the following department and acquire the relevant knowledge as follows:

Anatomy- Dissection techniques, Gross & Histological appearances of Vital Organs & Endocrines. Forensic Osteology, Anthropometry, Embalming & Relevant Embryology.

Physiology & Biochemistry- Functional aspects of Vital Organs & Endocrines, Physiology & Biochemistry of Blood, Semen, Saliva, Sweat, CSF, Postmortem Biochemistry of Body Fluids.

Pathology & Microbiology -Injury, Inflammation, Repair, Thrombo-Embolism, Shock, Gross & Microscopic Appearances of Vital Organs and histopathology in cases of sudden death e.g. Myocardial infarctions and other related diseases which can cause sudden death by complications e.g. tuberculosis, renal failure etc.& Endocrines Important Staining techniques, Museum Procedures, Infection, Immunology, HIV, Anaphylaxis. Observation, Collection, Preservation & Forwarding of Pathological & Microbial Evidence.

Medicine + Pediatrics + Psychiatry + Pharmacology + Medical Record Section- Awareness of Diagnosis, Evaluation of ECG in cases of Myocardial Infarctions. Medicolegal Aspects & Management of Critical Care, Poisoning & Psychiatry cases, Visit to MICU Set Up, Important Paediatric procedures + NICU Set Up, Pharmacology & Detection of Drugs of Dependence.

Casualty- First Aid , Examination, Diagnosis & Medical + Medico-legal Management of Clinical Medico-legal cases, Recording of Dying Declaration, Gastric lavage, Parenteral Injections, Emergency Tray, Casualty Administration in Mass Disasters.

Surgery + Orthopedics +Dentistry + Radiology + Anesthesiology- Awareness regarding Examination, Diagnosis & Medical + Medico-legal Management of cases of importants Regional Injuries (Polytrauma & Burns), Injury certification & Disability Evaluation, X-ray findings in Bone Trauma, and Age determination cases. Intracranial hemorrhages with the help of MRI and CT Scans, Visit to Surgical ICU & Operation Theatre, Awareness of important Anesthetic Procedures and complications, Important OT Instruments & Equipments.

Obstetrics & Gynecology- Abortion, Sterilization Techniques, Introduction to Major Obstetrics & Gynecology Procedures, Prenatal Diagnostic Techniques, Survivor of sex offence cases, Study of fetuses and placenta.

Forensic Science Laboratory: Introduction to various sections of the FSL Setup & Instrumentation, Introduction to & relevant awareness of important Qualitative & Quantitative Detection & Analytical Techniques. Introduction to & relevant awareness in Biology, Chemistry, Toxicology & Ballistics Divisions.

Postings in Chemical Examiner's Laboratory, Finger Print Bureau, Rajiv Gandhi Centre for Bio Technology

Note:-The Casualty Posting one month each- should be split in to two periods. The initial posting during First Year is introductory type. The Second Casualty posting is during Second year. This posting is the major one & it is expected that students must be exposed to maximum quantity & variety of cases. Their ability to manage the casualty in major casualties can be observed during this period.

2.16 Project work to be done if any

As stipulated by Head of the Department.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Core Books

- Modi's Text book of Medical Jurisprudence & Toxicology.
- Textbook of Forensic Medicine: J.B. Mukharjee, Vol. 1 & 2.
- Textbook of Forensic Medicine And Toxicology- Dr.B .Umadethan
- Principles of Forensic Medicine: A. Nandy.
- The Essentials of Forensic Medicine & Toxicology: K.S.N. Reddy.
- Textbook of Forensic Medicine & Toxicology, Principles & Practice: Krishan Vij
- Modern Medical Toxicology. V.V. Pillay
- Forensic Pathology: Bernard Knight
- Handbook of Forensic Pathology: Vincent Di Maio & Suzzanna E. Dana.

2.19 Reference books

- Bernard Knight: Cox's Medical Jurisprudence & Toxicology.
- Russel S. Fisher & Charles S. Petty: Forensic Pathology.
- Keith Simpson's Forensic Medicine.
- Jurgen Ludwig: Current methods of Autopsy practice.
- Camps F.E. Gradwohls Legal Medicine, Bristol Wright.
- Simpson's: A Doctors guide to Court.
- Polson C.J.: The Essentials of Forensic Medicine.
- Adelson L.: The Pathology of Homicide.
- Tomio Watanabe: Atlas of Legal Medicine.
- Spitz W.U. & Fisher R.S.: Medico-legal Investigation of Death.
- Keith Mant, Taylor's Principles & Practice of Medical Jurisprudence.
- Justice Hidayatullah & V.R. Manohar: The Indian Penal Code.
- Justice Hidayatullah & S.P.Sathe: The Code of Criminal Procedure.
- Justice Hidayatullah & V.R. Manohar: The Law of Evidence.
- H.S. Mehta: Medical Law & Ethics in India.
- Code of Medical Ethics, Medical Council of India
- Krogman W.M.: The Human Skeleton in Legal Medicine.
- F.E. Camps, J.M. Cameron, David Lanham: Practical Forensic Medicine.
- B.V. Subrahmanyam: Textbook of Forensic Medicine & Toxicology.
- R.D. Lele: The Medical Profession & Law.

2.20 Journals

- Journal of Forensic Sciences.
- Journal of Legal Medicine (American College of Medicine.).
- Journal of Forensic Science Society.

- Medico-legal Journal.
- American Journal of Law & Medicine.
- American Journal of Forensic Medicine
- Forensic Science International.
- Journal of Clinical Forensic Medicine.
- Medicine Science & Law.
- Science & Justice.
- Journal of Indian Academy of Forensic Medicine.
- Journal of Punjab Academy of Forensic Medicine and Toxicology
- Journal of Forensic Medicine & Toxicology
- Medico-legal Update.
- Journal of Forensic and Legal Medicine.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University of Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATIONS

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination).**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

   Paper 1: Basic medical sciences

   Paper 2: Forensic Medicine including other clinical subjects as applied to it

   Paper 3: Forensic Toxicology & Medical Jurisprudence

   Paper 4: Forensic Pathology including Forensic immunology & Recent advances

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before

the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

Theory Examination (Total=400)

Title Marks

Paper 1: Basic medical sciences - 100

Paper 2: Forensic Medicine including other clinical subjects as applied to it - 100

Paper 3: Forensic Toxicology & Medical Jurisprudence- 100

Paper 4: Forensic Pathology including Forensic immunology & Recent advances - 100

Total 100+100+100+100= 400

Practical & Viva-voce Examination (Total=400)

Practical-300

Viva –voce-80

Logbook-20

Total-300+80+20=400

Practical Exercises-Maximum Marks-300. Grand Viva-80, Log book -20

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

Paper 1: Basic medical sciences

Paper 2: Forensic Medicine including other clinical subjects as applied to it

Paper 3: Forensic Toxicology & Medical Jurisprudence

Paper 4: Forensic Pathology including Forensic immunology & Recent advances

3.6 Model question paper for each subject with question paper pattern

Paper-I Basic Medical Sciences Max. Marks:100 Time: 3 hrs

- **Attempt ALL questions**
- **Answer each question & its parts in SEQUENTIAL ORDER**
- **ALL questions carry equal marks**
- **Illustrate your answer with SUITABLE DIAGRAMS**

I -Essay -20 Marks

1- Describe blood supply of the heart. What are the histopathological changes in MI?

II-Write short Answers-8X10=80 marks

2. Describe anatomy of skull from medico-legal point of view.
3. Describe the physiology of muscle contraction & rigor mortis.
4- How can you identify the sex of a person microscopically?
5-Enumerate the medico-legal importance of examination of blood.
6- Describe the age changes in pubic symphysis and its medico-legal significance.
7-I Discuss the patho-physiology of hypovolemic shock.
8- Describe the Circle of Willis and its medico-legal importance.

****

Paper-II Forensic Medicine including other clinical subjects as applied to it Max. Marks:100 Time: 3 hrs

- **Attempt ALL questions**
- **Answer each question & its parts in SEQUENTIAL ORDER**
- **ALL questions carry equal marks**
- **Illustrate your answer with SUITABLE DIAGRAMS**

Essay-20 marks

I Describe the examination procedure and findings in a 16 year old victim of

rape.

Short answers-8X 10 =80

II Explain therapeutic misadventure with examples.

III Discuss the role of radiological examination in clinical forensic medicine.

IV Discuss the medico-legal aspects of artificial insemination.

V Describe elementary ballistic principles and their medico-legal significance.

VI What are the medico-legal aspects of insanity?

VII Discuss medico-legal aspects of treatment including iatrogenic disease and industrial hazards.

VIII Enumerate the medico-legal importance of Ultrasound and CT scan.

****

Paper-III Forensic Toxicology & Medical Jurisprudence Max. Marks:100 Time: 3 hrs

- **Attempt ALL questions**
- **Answer each question & its parts in SEQUENTIAL ORDER**
- **ALL questions carry equal marks**
- **Illustrate your answer with SUITABLE DIAGRAMS**

Essay-20 marks

I Describe in detail the set up of Modern poison control centre.

Short answers-8X 10=80 marks

II Classify insecticides/Organophosphorus compounds.

III What is Therapeutic misadventure? Explain with examples.

IV What is professional negligence? Give some examples.

V What are medico-legal issues pertaining to Plumbism?

VI Discuss the ethical considerations for Human experimentation.

☆

VII Enumerate the salient features of NDPS Act.

VIII Describe the signs and symptoms, fatal dose, treatment, and postmortem changes in case of Alphos poisoning.

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Paper-IV Forensic Pathology including Forensic immunology & Recent advances
Max. Marks:100 Time: 3 hrs

- **Attempt ALL questions**
- **Answer each question & its parts in SEQUENTIAL ORDER**
- **ALL questions carry equal marks**
- **Illustrate your answer with SUITABLE DIAGRAMS**

Essay- 20 marks

I Enumerate the Tissues/materials preserved for DNA analysis.

Short answers-8X10= 80 marks

II Discuss to substantiate that applied aspects of Forensic Pathology & Odontology have much to help the system of Penology, law & order and to assure justice.

III Discuss the medico-legal aspects of Human organ transplantation.

IV Discuss the scope of Entomology in determination of time since death. Quote recent famous cases where this technique proved of significant value.

V Discuss the ethical issues related to Cloning.

VI Discuss ML applications of DNA fingerprinting. Also discuss the probative value of this evidence.

VII Discuss the ethical issues pertaining to Renting of Womb.

VIII What are the liabilities of a doctor in case of mismatched blood transfusion?

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams.

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Practical & Viva-voce Examination (Total=400)

Practical-300

Viva –voce-80

Logbook-20

Total-300+80+20=400

Practical Exercises-Maximum Marks-300. Grand Viva-80, Log book -20

Sl No	Topics and Exercises	Maximum time	Maximum Marks
A	**Forensic Pathology**	**3Hour**	**85**
A1	Autopsy–(Procedure-15+Observation-15+Interpretation-10+Making Report-10)	2 hours	50
A2	Foetal Autopsy-	30 Minutes	15

	(Procedure-10,Interpretation-5)		
A3	Skeletal remains-4 different bones	30 Minutes	20
	Discussion		
B	**Clinical Forensic Medicine-Medico-legal Examination and Report writing**	**2 Hours**	**90**
B1	Identity, Dentition and Age examination and reporting	20 Minutes	15
B2	Potency/ Sexual Offence-Accused	20 Minutes	15
B3	Wound examination and certification	20 Minutes	15
B4	Examination and certification of a Mentally ill person	20 Minutes	15
B5	Examination and certification of a case of Drunkenness	20 Minutes	15
B6	Blood group identification and reporting of a sample of blood group	15 Minutes	5
B7	Interpretation of a REPORT of a Victim of Sexual Offence	15 Minutes	10
	Discussion		
C	**Spotters-Examination and reporting**	**3 hours**	**90**
C1	Examination of X-rays and reporting of Age -4 X rays of different regions	30 Minutes	15
C2	Wet Specimens-5 different Specimens	30 Minutes	15
C3	Photographs-5 different Photographs	30 Minutes	15
C4	HPE slide/ Smear-5 different slides	30 Minutes	15
C5	Weapons-5 different weapons	30 Minutes	15
C6	Toxicology Specimens-5 Different specimens	30 Minutes	15
	Discussion		
D	**Expert Opinion**		
	Post-mortem/ ML report/Ethical / Negligence issues	30 Minutes	25
E	Micro teaching	15 Minutes	10
F	**Grand viva**	**1 hour**	**80**
G	**Log book**		**20**

3.9 Number of examiners (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M C I Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have

teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years' experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Iternal examiners shall be a Professor or Head of the Department.

3.10 Details of viva:

Grand viva	**1 hour - 80 marks**
Log book	**20 marks**

Not applicable for P.G. Medical degree courses.

4 INTERNSHIP

Not applicable for P.G. Medical degree courses.

5 ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum committee of the concerned Institution.

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD IMMUNOHAEMATOLOGY AND BLOOD TRANSFUSION

Course Code 223

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Immunohaematology and Blood Transfusion.

2.2 Objectives of course

GOAL

The goal of Post Graduate medical education shall be to produce competent specialists and / or Medical teachers.

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the National health policy.
- Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
- Who shall be aware of the contemporary advance and developments in the discipline concerned.
- Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology.
- Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

At the end of the Post Graduate training in the discipline concerned the student shall be able to;

- Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health sector.
- Practice the speciality concerned ethically and in step with the principles of primary health care.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.

- Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of National health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

Immunohaematology and Blood Transfusion

Preamble:

Transfusion Medicine (Immunohaematology and Blood Transfusion) is a diverse and multifaceted discipline of Hematology. The responsibilities of Transfusion Medicine physicians in hospital blood transfusion service are more varied than those of most other medical specialties. It includes direct patient care and clinical consultation, medical direction of clinical testing laboratories, supervision of blood component manufacture and storage, inventory management and distribution, and regulatory compliance. The Transfusion Medicine physician, therefore, must be adept at balancing patient care issues, regulatory standards, manufacturing principles, and resource limitations in meeting patient needs.

The purpose of the course is to provide didactic education and practical training in all aspects of blood transfusion technology, to develop the knowledge required to analyze immunohaematologic problems, to provide expertise in blood center administrative policies such as donor recruitment, collection, storage, preservation, administration of blood and components and to develop those qualities needed for component supervisory and academic responsibilities.

Aims and Objectives of MD Transfusion Medicine (Immunohaematology and Blood Transfusion)

- To understand the basic principles and concepts presented in the transfusion medicine core curriculum and develop a fund of basic knowledge in the field.
- To recognize problems in clinical medicine those are related to transfusion and apply concepts and principles in the core curriculum to clinical situations.
- To promote optimal use of blood products and develop a system for clinical control of their use
- To provide appropriate therapeutic solutions to transfusion medicine problems.
- To recognize motivational, organizational and managerial skills for efficient operation of blood center.
- To provide direction to academic blood center with regard to organization of the collection, preparation, storage, distribution and clinical use of blood and components.
- To recognize the significance of important research in the advancement of transfusion medicine
- To participate in research in blood transfusion medicine and upgrade the scientific knowledge by continuing medical education
- To organize training program for manpower development in the field.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As mentioned in clause 2.10 of the curriculum.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As mentioned in clause 2.10 of the curriculum.

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

Not applicable.

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

- All Post Graduate students should take part in the teaching of Under Graduate medical students and paramedical students under supervision.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should also be based on the participation in seminars, journal review and the performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of the department and the progress record should be maintained by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

A postgraduate appearing for the MD degree in this specialty is supposed to have acquired not only professional competence expected of a well-trained specialist but also academic maturity, a capacity to reason and critically analyze a set of scientific data. He is supposed to keep himself abreast with the latest developments in the field of the blood transfusion & Immunohaematology and related sciences. A brief outline of what is expected to have learnt during each of the postings in the different sections/laboratories during this MD Course is given under each head.

I. Basic Sciences (Immunology, Medical Genetics, Hemostasis & Physiology of Formed Elements of blood)

Cognitive Domain (Knowledge)

- Demonstrate familiarity with the current concepts of structure and function of the immune system, its aberrations and mechanisms thereof. The student should be able to demonstrate understanding of the basic principles of immunoglobulins, antigen, antibody and complement system, antibody development after immunization and infection.
- Understand the basic concepts and their clinical relevance of the followings
    - Mechanisms of acute inflammation

- Healing and repair
- Physiology of Immune System
- Hypersensitivity Reactions
- Autoimmunity
- Transplantation Immunology

- Demonstrate familiarity with the scope, principles, limitations and interpretations of the results of the following procedures employed in clinical and experimental studies relating to immunology.
  - ELISA techniques
  - Radioimmuno assay
  - HLA typing
  - Hybridoma technology
  - Isolation of T & B lymphocytes
  - CD4 / CD8 count
  - Microlymphocytotoxicity test
  - Cellular assays
  - Electrophoresis and Immunofluorescence
- Understand the principles of basic genetics with regard to Mendelian law of inheritance, phenotype/genotype and population genetics.
- Know the nomenclature, organization and polymorphism of the human major histocompatibility complex, including HLA class I, II, and III genes. Understand the role of HLA typing in organ and bone marrow/stem cell transplantation and association with disease
- Understand the basic concept of haematopoiesis and bone marrow kinetics
- Understand the basic physiology and biochemistry of red cells, platelets and leukocytes in terms of their kinetics, function, life span and antigenic systems. Know the membrane structure and function of red cells, platelets and leukocytes and be able to apply their implication in transfusion medicine
- Understand hemoglobin structure, synthesis, function, its aberrations. and degradation including iron and bilirubin metabolism
- Understand the composition and function of plasma constituents.
- Know the pathophysiology and laboratory features of intravascular and extravascular hemolysis
- Understand the physiology of hemostasis with regard to role of platelets, coagulation pathway and fibrinolysis, its aberrations and mechanisms thereof such as coagulopathy

of liver disease, vitamin K deficiency, disseminated intravascular coagulation & hemophilia etc.

- Understand hemodynamics of blood flow and shock; estimation of blood volume and be able to interpret the application of radionucleotides tagging for blood volume estimation.
- Should understand the principles of Molecular biology especially related to the understanding of disease processes and its use in various diagnostic tests.

Psychomotor Domain (Skills)

- Demonstrate competency in performing & interpretation of various methods of hemoglobin estimation and complete hemogram.
- The student should be able to demonstrate competency in preparation and interpretation of peripheral blood smear in health and disease conditions:
    - Nutritional (Iron deficiency/Vit B12 and Folic acid deficiency) anemia
    - Hemolytic anemia (Immune , Sickle Cell, Thalassemia, Microangiopathic)
    - Thrombocytopenia
    - Acute leukemia
    - Chronic leukemia
    - Hemoparasites
- Demonstrate competency in performing and interpretation of laboratory tests in coagulation and thrombosis such as prothrombin time, activated partial thromboplastin time (APTT), fibrinogen, thrombin time, platelet function testing, mixing tests, factor assays, investigations in DIC etc.
- Demonstrate proficiency in performing and interpreting various laboratory immunological tests pertaining to transfusion science such as
    - isolation of T & B lymphocytes
    - immunoelectrophoresis
    - flow cytometry
    - CD4 / CD8 counts
- Demonstrate proficiency in HLA typing techniques, including serological methods, micro cytotoxicity assays, nucleic acid assays and lymphocyte culture.
- Should be conversant with the steps of a Polymerase Chain Reaction (PCR) and should demonstrate competence in the steps and interpretation of Western Blot and Hybridization procedures.

Affective Domain (Behavior)

- Demonstrate honesty and integrity in all interactions.

- Demonstrate responsibility and trustworthiness in the execution of all duties.
- Demonstrate the ability to accept criticism and to understand the limitations of one's own knowledge and skills.
- Demonstrate a commitment to excellence and ongoing professional development

II Blood Collection/Blood Center/Component Processing

Cognitive Domain (Knowledge)

- The student should be able to demonstrate understanding of the processes associated with Blood Donor motivation (motivation strategies), recruitment, selection and proper donor care in blood center as well as in outdoor blood donation camps and be able to understand importance of cold chain maintenance.
- Be able to understand donor counseling and notification (Pre and Post-donation).
- The student should be familiar with various categories of blood donors including autologous and directed donors and be able to know their clinical relevance.
- Understand the process of apheresis and demonstrate proficiency in selection of apheresis machine, apheresis donor and be able to obtain apheresis product meeting quality standards
- Understand the mechanisms of adverse effects of blood/apheresis donation, its clinical features, management and prevention.
- Demonstrate understanding of various anticoagulant / preservatives used for collection and storage of blood and components.
- The student should be familiar with various "storage lesions" in blood components, factors affecting the storage lesions and its prevention. Student should be able to demonstrate understanding of various plasticizers used in blood banking and their clinical relevance.
- Understand the principles of component preparation by various methods. The student should be familiar with preparation of modified components such as leukofiltered, irradiated or saline washed, pooled or volume reduced components following aseptic conditions.
- The student should be able to demonstrate understanding of the basic principles of preparation and composition of recombinant products such as Factor Vll, Factor Vlll, Factor lX, concentrate and hematopoietic growth factors.
- Understand the factors influencing quality of blood and blood components including quality of blood bag/apheresis.
- Be able to understand maintenance of quality of blood components as per recommended standards by various agencies (DGHS, DCGI, , NABH, NACO, AABB, EC)

- Should be able to identify problems in the blood / apheresis collection and component preparation area and offer viable solutions

Psychomotor Domain (Skills)

- Compare and contrast the eligibility requirements for allogeneic, autologous & apheresis blood donations.
- Demonstrate proficiency in selection of whole blood donors (minimum 500) and apheresis donors (minimum 25)
- Demonstrate competency in various types of autologous blood collection and their application in clinical transfusion service
- Demonstrate proficiency in collection of whole blood with regard to preparation of phlebotomy site, proper volume and sample collection in minimum 500 donors.
- Demonstrate proficiency in evaluating and managing minimum 25 adverse reactions associated with blood donation/phlebotomy (whole blood and apheresis donations).
- Demonstrate the proficiency in organization of at least 10 outdoor blood donation camps and demonstrate skills to motivate blood donors/organizers.
- Demonstrate knowledge of the indications for therapeutic phlebotomy and demonstrate proficiency in at least 5 cases.
- Demonstrate proficiency in preparation of following components as per department SOP
    - Packed red blood cells (Minimum 500)
    - Fresh Frozen Plasma (Minimum 500)
    - Platelet concentrate (Minimum 500)
    - Cryoprecipitate (Minimum 25)
- Understand the significance of storage of blood components at appropriate temperature and demonstrate proficiency in compatibility, labeling requirements of various components.
- Proficient in donor notification and counseling (Pre and Post donation) and the donor look-back process.
- Demonstrate proficiency in various modifications of blood components such as irradiation, cell washing, volume depletion and leukodepletion
- Demonstrate proficiency in performing leuko-filtration in at least 5 blood components
- Demonstrate proficiency in selection of apheresis machine, blood donor and be able to obtain apheresis product meeting quality standards in at least 25 procedures.
- Demonstrate proficiency in performing quality control tests on at least 25 each blood components such as PRBC, FFP, Platelets, Cryoprecipitate.

Affective Domain (Behavior)

- The student should be able to function as a part of a team that is essential for the selection and management of a blood donor. It is implied that he/she will whenever necessary interact with the blood donor, patient, clinician and other colleagues to provide the best possible blood transfusion support, diagnosis or opinion.
- Demonstrate compassion and sensitivity in the care of patients and respect for their privacy and dignity.
- The student should demonstrate professionalism during blood donor selection, counseling and notification.
- Always adopt ethical principles and maintain proper etiquette in his/her dealings with blood donors, outdoor camp organizers and other health personnel.
- Be able to obtain informed consent from donor.
- Respect the rights of the blood donor including the right to information and maintaining confidentiality.
- Develop communication skills not only to word reports and professional opinions but also to interact with blood donors, outdoor camp organizers, peers and paramedical staff.
- Always adopt principles of laboratory/personnel safety and respect documentation required as per law.

III Transfusion Transmitted Infection

Cognitive Domain (Knowledge)

- The student should be able to demonstrate understanding of various strategies for improving blood safety in general and TTI testing in particular pertaining to Indian conditions.
- The student should be able to understand the typical time course of appearance and disappearance of serum antigens and antibodies used in screening of major transfusion transmitted infection, including: HIV, Hepatitis B, Hepatitis C, Syphilis and Malaria and others.
- The student should be able to demonstrate understanding of the principles of blood safety including testing for various transfusion transmitted infection (TTI), proper disposal of infectious waste, laboratory safety, personnel safety.

- Demonstrate understanding of newer technologies that are being introduced in the field of TTI testing. Understand the feasibility of NAT in Indian blood transfusion services
- Demonstrate understanding of the new emerging threats (including Prions, vCJD, Lyme disease, West Nile Virus, Dengue, Chikungunya etc.) to blood supply in the country.
- Demonstrate understanding of bacterial contamination, their detection and prevention.

Psychomotor Domain (Skills)

- Compare & contrast various methodologies such as ELISA, rapid & chemiluminescence used in screening of transfusion transmitted infections
- Demonstrate proficiency in performing, interpretation, documentation of at least 500 blood donor screening tests for TTIs as per departmental SOP.
- Demonstrate proficiency in preparation and interpretation of LJ Chart (5 nos.) and root cause analysis (RCA) and Corrective and Preventive action (CAPA) as and when required.
- Perform and be able to interpret Non-Treponemal and Treponemal antibody tests used to diagnose syphilis.
- Demonstrate proficiency in proper handling and disposal of bio-hazardous material as per regulatory requirements
- Demonstrate proficiency in the preparation and use of in-house external controls in transfusion transmitted infection screening.
- Demonstrate proficiency in Gram staining in at least 10 samples of biological fluids.

Affective Domain (Behavior)

- Respect the rights of the sero-positive blood donor including their confidentiality, right to information.
- Adopt ethical principles and maintain proper documentation while interacting with other inter related labs such as ICTCs, counselor, state AIDS Control Societies etc.
- Student should follow all safety policies and adhere to the department's laboratory safety plan and personal hygiene plan.

IV Immunohaematology / Blood Group Serology / Compatibility testing

Cognitive Domain (Knowledge)

- Demonstrate understanding of the knowledge of various major and minor blood group systems including their biosynthesis, antigen/antibodies, phenotype/genotype frequency, clinical significance.
- The student should be able to demonstrate understanding of the various Immunohaematological laboratory tests including its quality essentials.
- Demonstrate knowledge of principle of pre-transfusion testing, including ABO/Rh testing, RBC antibody screen, and antibody identification.
- Student should also demonstrate understanding of resolution of discrepant results in ABO / Rh grouping and pre transfusion testing and be able to provide solutions for the management of such cases.
- Student should demonstrate the understanding of use of various potentiators and their applications in solving immunohematological problems such as polyagglutination, subgroups of ABO system, red cell antibody detection
    - Enzymes
    - Lectins
    - LISS / Albumin
    - others
- Student should have knowledge of various advances in this field including automation and computerization.
- The student should be able to demonstrate understanding of the pathophysiology, clinical features, lab diagnosis & management of various clinical conditions requiring immunhematological and transfusion support including
    - Multi-transfused patients such as thalassemia, sickle cell disease etc
    - Alloimmunized antenatal cases and HDN
    - Transfusion reactions
    - Immune hemolytic anemias
    - ABO mismatched transplants (BMT / Solid organ)
- The student should be able to demonstrate understanding of the pathophysiology, clinical features, lab diagnosis & management of Rh, ABO and other blood group incompatibility in antenatal patients including exchange transfusion / intra uterine transfusion.
- The student should demonstrate the knowledge regarding “rare blood group donor” including identification, cryo-preservation of rare blood and making their registry.

Psychomotor Domain (Skills)

- Demonstrate proficiency in preparation of cell suspensions of appropriate concentration following cell washing techniques correctly & grade and interpret antibody-antigen reactions according to the established criteria
- Demonstrate proficiency in performing ABO/Rh grouping in at least 500 donor/patient samples using department SOP.
- Demonstrate proficiency in performing, interpretation and resolving discrepant results in pre-transfusion testing, ABO/Rh grouping, red cell antibody screen, and antibody identification.
- Compare and contrast conventional cross matching versus type and screen using various advanced technologies. Demonstrate proficiency in performing at least 50 cross matches as per department SOP.
- Student should be able to differentiate between the direct and indirect antiglobulin tests and identify appropriate uses for each. Student should be able to perform direct and indirect antiglobulin test on appropriate specimens, grading and recording the results appropriately with the use of "check cells".
- Student should be able to identify sources of error in antiglobulin testing.

- Using a cell panel, perform antibody identification procedures and correctly interpret the results. Identify clinically significant RBC antibodies from an antibody panel including multiple alloantibodies and mixtures of alloantibodies and autoantibodies; determine how difficult it will be to obtain blood for this patient, and effectively communicate these results to clinicians.

- Demonstrate proficiency in performing & interpretation of various immunohematological tests
    - Direct Antiglobulin test (50 tests)
    - Indirect Antiglobulin test (50 tests)
    - Red cell antibody detection and identification (25 tests)
    - Titration of Anti D and Anti A and Anti B (25 tests)
    - Elution (10 tests)
    - Adsorption (10 tests)
    - Minor blood group typing (10 tests)
    - Saliva Inhibition Test (10 tests)
    - Resolution of ABO discrepancy (10 tests)

- Demonstrate proficiency in selection of blood unit for a patient with auto immune hemolytic anemia in at least 5 cases

- Demonstrate proficiency in cryo-preservation of reagent red cells in minimum 5 cases.

Affective Domain (Behavior)

- Should be able to interact with clinical colleagues in professional manner to provide best possible transfusion support and opinion in immunohaematological problems.
- Demonstrate improvement in the affective traits of organizational skills, work habits, attitude, interpersonal skills, and problem-solving ability.
- The student should maintain a clean and orderly work area.

V Clinical Transfusion Service

Cognitive Domain (Knowledge)

- Demonstrate knowledge of the principles of patient/unit identification and its importance in blood safety.
- Understand the principles of blood inventory management.
- The student should be able to demonstrate understanding of the rational use of blood and components in various clinical conditions including monitoring of transfused patients.
- Recognize the symptoms and signs of hemolytic and non-hemolytic transfusion reactions and demonstrate knowledge of the pathophysiology, treatment, and prevention of these complications
- Demonstrate understanding of the major noninfectious complications of blood transfusions, including red cell allo-immunization, transfusion-related acute lung injury, transfusion associated graft versus host disease, volume overload, post transfusion purpura, iron overload etc and the risk of these complications, and strategies to prevent them. Student should have knowledge of pathophysiology, clinical features, diagnosis and management of these conditions.
- Demonstrate knowledge of pathophysiology, diagnosis & management of anemia
    - Iron deficiency anemia
    - Megaloblastic anemia
    - Aplastic anemia
    - Anemia of chronic diseases
    - Neonatal anemia
- Demonstrate understanding of pathophysiology, clinical / laboratory diagnosis and treatment of patients with bleeding disorders such as Hemophilia, von Willebrand's disease, thrombophilia, acquired coagulation disorders including DIC, liver disease etc.

- The student should demonstrate understanding of the pathophysiology, clinical features, lab diagnosis and platelet support in thrombocytopenic conditions such as aplastic anemia, ITP, NAIT, hematological malignancies etc.
- Student should also demonstrate understanding of complications of platelet transfusion including refractoriness to platelets, its diagnosis and management.
- Student should demonstrate understanding of the basic principles of neonatal transfusions including serological testing, type of transfusion support, exchange transfusion, intra uterine transfusion and monitoring.
- The student should demonstrate knowledge of the Pathophysiology, diagnosis and transfusion support in acute blood loss including massive transfusion protocols, complications of massive transfusion and their prevention.
- Demonstrate understanding of the knowledge of various methods of blood conservation, including pre- and perioperative autologous blood collection, and approaches to "bloodless" surgery.
- Demonstrate knowledge of the use of various point-of-care tests (TEG, ROTEM) for hemostasis & recommend component therapy depending on the results.
- Student should demonstrate knowledge of principles of transfusion support in general surgery and special procedures such as cardiac surgery or oncological surgery.
- Demonstrate knowledge of the principles of hematopoietic stem cell transplantation, including collection, processing, and storage of these stem cell products, and the indications for use (e.g., bone marrow, peripheral blood, and cord blood). Student should demonstrate understanding of regulatory guidelines for stem cell research. (ICMR, DBT).

Psychomotor Domain (Skills)

- Demonstrate proficiency in evaluating and recommending treatment plans for minimum of 10 transfusion reactions.
- Be able to identify irregular antibodies in pregnant patients that are clinically significant and make appropriate recommendations for blood products.
- Demonstrate proficiency in preparation and transfusion of blood for intra uterine transfusion/ exchange transfusion.
- Choose appropriate blood components and derivatives based on a thorough knowledge of the indications for transfusion.

- Demonstrate proficiency in the evaluation and appropriate transfusion therapy of thrombocytopenic patients (both adult and pediatric) including neonatal alloimmune thrombocytopenia.
- Demonstrate proficiency in provision of transfusion support in special patient populations (e.g., hematology/oncology, pediatrics, thalassemia, hemophilia, transplantation, cardiac surgery and burn/trauma).
- Demonstrate proficiency in the appropriate use of blood components in at least 10 clinical conditions such as hemoglobinopathies, hemophilia, autoimmune hemolytic anemia, massive transfusion, obstetric conditions etc.
- Demonstrate familiarity with the appropriate use of highly specialized blood products (e.g., granulocytes, donor lymphocyte infusions, HLA-matched platelets, and coagulation factor concentrates).
- Demonstrate competence in the management of blood inventory and the ability to communicate effectively the hospital's needs to the blood donor recruiters. Triage and screen requests for blood components appropriately during inventory shortages.
- Demonstrate proficiency in evaluating effectiveness of platelet transfusion including patient's with refractoriness to platelet transfusions. Outline the principles of histocompatibility testing and platelet cross-matching and apply this knowledge in selecting appropriate platelet products when indicated.
- Demonstrate competency in providing transfusion and immunohematological support to patients with bone marrow / stem cell transplantation including cryo-preservation of stem cell, quality control and infusion.

Affective Domain (Behavior)

- Should be able to function as a part of a team that is essential for the diagnosis and management of a patient. He/she should therefore develop an attitude of cooperation with his/her colleagues so necessary for this purpose.
- Should be able to interact with clinical colleagues in professional manner to provide best possible transfusion support and opinion.
- Demonstrate improvement in the affective traits of organizational skills, work habits, attitude, interpersonal skills, and problem-solving ability.
- The student should maintain a clean and orderly work area.

- The student should accept constructive criticism as a learning process. Utilize constructive criticism to correct deficiencies and improve performance.
- The student should demonstrate inquisitiveness by asking necessary questions concerning practical performance or theoretical application of laboratory procedures.

VI Therapeutic Apheresis, Therapeutic Plasma Exchange and Cytapheresis

Cognitive Domain (Knowledge)

- Understand the principles of apheresis technology, including centrifugation, filtration, and immunoadsorption.
- Demonstrate knowledge of the indications for therapeutic apheresis including cytapheresis and of the appropriate replacement fluids to be used in various situations.

Psychomotor Domain (Skills)

- Demonstrate proficiency in evaluating and preparing patients for therapeutic apheresis, including discussion with the patient of the risks and benefits associated with apheresis procedures and obtaining informed consent.
- Should be able to perform plasma exchange including calculation & type of replacement fluid to be used and monitoring patient for complications and efficacy of the procedure.
- Demonstrate proficiency in evaluating and treating adverse reactions associated with therapeutic apheresis.
- Demonstrate proficiency in the treatment of patients using specialized methods (e.g., photopheresis and immunoadsorption columns).

Affective Domain (Behavior)

- Communicate effectively with clinicians and patients regarding emergent or scheduled therapeutic apheresis procedures through conversations and writing of consult notes

VII Regulatory Skills / Quality Assurance/ Quality Control in blood transfusion

Cognitive Domain (Knowledge)

- Demonstrate knowledge concerning the requirements and applications of all applicable regulatory and accrediting agencies. [e.g., DCGI, NACO, DGHS, NABH, AABB].

- Become familiar with the patient / blood donor privacy and data security requirements, including the use of institutional review board (IRB) protocols for conducting clinical research. For conducting stem cell research- ICSCRT (Institutional Committee for Stem Cell Research and Treatment).
- Understand training, certification, licensing, and competency assessment standards for transfusion laboratory professionals, including medical laboratory technicians.
- Understand the importance of a comprehensive transfusion laboratory safety policy and program.
- Understand how SOPs are used, developed, authored, and reviewed and their importance in mandatory laboratory inspection by various accrediting agencies.
- Understand development of quality manual.
- Understand the role of quality assurance, quality management, and process improvement principles in laboratory operation and planning.
- Understand the role of risk management in the transfusion laboratory and become familiar with the nature of, patient safety initiatives, and forensic testing such as paternity testing
- Demonstrate understanding of the elements of current good manufacturing practices as they apply to the collection, processing, and storage of all blood components / products.
- Understand the principles & objectives of total quality management in transfusion service including premises, personnel, instruments / reagents, biosafety and external / internal quality control. Operational aspects.
- Understand the importance of EQAS in blood transfusion services.
- Understand the principles and objectives of equipment management including specification, equipment selection, installation,, calibration / standardization / validation, and preventive maintenance.
- Know fundamental concepts of medical statistics. Demonstrate familiarity with importance of statistical methods in assessing data from patient material and experimental studies e.g., correlation coefficients, expected versus observed, etc. and their interpretation.
- Understand principles of specimen collection (e.g., phlebotomy technique, safety, and specimen tubes) and specimen processing and traceability
- Demonstrate the understanding of knowledge of error management in blood bank including root cause analysis and CAPA.
- Demonstrate the knowledge of various records and their maintenance as per regulatory requirements.

Psychomotor Domain (Skills)

- Demonstrate proficiency in preparing at least 5 SOP for the department.
- Be able to understand proper use of instrumentation and computerization in a transfusion laboratory.
- Compare and contrast the various means of performing blood utilization reviews.
- Explain the logistics required in determining appropriate blood inventory for a geographic region and the process of meeting daily, weekly and monthly collection goals.
- Recognize sources of pre-analytical variation and the role of biological variability in laboratory assessment.
- Be able to calculate means, standard deviation and standard error from the given experimental data
- Demonstrate the proficiency in preparedness for getting accreditation.
- Ability to generate various reports required for the various regulatory authorities.
- Be able to perform root cause analysis in at least 5 cases.

Affective Domain (Behavior)

- Provide leadership and inspire members of the team with whom he/she is involved with in the fields of management of transfusion services, teaching and research

VIII Additional competencies & recent advances specific to transfusion medicine

Ethical Issues

- Demonstrate the knowledge of ethical issues related to patient management, donor care and clinical research.

Patient Care

- Be able to apply recent developments in the field from research to clinical practice such as:
    - Blood and platelet substitutes
    - Biomaterials e.g., fibrin glue, platelet gel
    - Growth factors
    - Cryopreservation techniques
    - Gene therapy /Proteomics/Microarray

Practice-Based Learning and Improvement

- Demonstrate the ability to develop new policies and procedures or change existing policies and procedures based on a review of the literature or issuance of new guidelines by regulatory agencies.

Interpersonal and Communication Skills

- Demonstrate the ability to discuss the process of therapeutic apheresis with patients, and/or family members where appropriate; answer their questions; and obtain informed consent.

Research methodologies and Biostatistics

- Demonstrate the knowledge of various research methodologies and their applications of bio statistics in analyzing the research data.

Computer skills

- Demonstrate the knowledge in computer based technologies related to transfusion medicine and efficiency in handling related software.

Newer technologies

- Develop skill in learning and implementing newer technologies in development of transfusion science in accordance with regulatory requirements eg;barcode.

Disaster Management

- Demonstrate understanding of principles of Disaster Management including transfusion support

2.11 No: of hours per subject

Present in clause 2.10 of the curriculum.

2.12 Practical training

The training program may be arranged in the form of postings to different areas for specified periods as outlined below. The period of such assignments/postings is for 36 months (3 years). Posting schedules may be modified depending on needs, feasibility and exigencies.

01st-12th Month-1st year-Department of Transfusion Medicine
13th-24th Month-2nd year-Allied labs and clinical sections
25th-36thMonth-3rd year-Department of Transfusion Medicine

Department rotation of students-01st-12th month. (1st year)

Title	Content of training activities	Learning objective
Orientation	Brief orientation to computer system, blood bank activities, teaching program	Be conversant with computer system & operation of blood bank activities
Blood donation	Donor recruitment & motivation, Donor selection Phlebotomy, Post donation care of donor, Outdoor blood donation	Should be able to select the donor, perform phlebotomy with aseptic precautions, manage donor reactions and maintain records
Apheresis– donor and therapeutic	Access evaluation, donor suitability, selection of machine, product manipulation, QC of product, donor observation for adverse effects and its management Indications, contra indications, replacement fluids, frequency, monitoring of TPE	Should be able to perform the procedure independently, obtain quality product and manage any adverse effects Should be able to select proper apheresis equipment, plan TPE, select replacement fluids & monitor the patient
Component preparation	Preparation of blood components. Product manipulation such as Leucocyte removal or Irradiation. Storage & quality control	Should be able to understand factors affecting quality of components,
Immuno-haematology	Diagnosis & transfusion support in AIHA, PNH Evaluation of transfusion reaction. Investigations in antenatal serology. ABO-Rh typing, antibody screening, identification, evaluation of positive DAT	Should be able to interpret immuno-hematological tests. Should be able to provide consultation to physicians regarding transfusion management
Pre-transfusion testing & cross match	Investigation of difficult cross match, formal consultation on transfusion support in complex cases, checking indications & dosage for blood components, emergent issue of blood, transfusion in special cases such as massive transfusion, organ transplantation, platelet refractoriness.	Should be able to provide consultation on transfusion therapy. Should be able to resolve difficult & complex cross matching problems. Ensure appropriate and judicious use of blood and components
Transfusion Transmitted infection screening	Screening for various markers such as HIV, HCV, HBsAg, and Syphilis. Methodology such as Elisa, spot, rapid, automated analyzer NAT techniques such as PCR, TMA. Laboratory safety	Should be able to understand blood screening principles and disposal of reactive units. Should be able to validate ELISA, maintain QC
Quality control/	Quality control of components, equipment, reagents. Quality	Should be able to understand QC principles, Recognize common

records	assurance. Development of documents, SOPs, Regulatory compliance	management & regulatory issues, identify management strategies

Apart from above mentioned postings, the candidate can be assigned with other duties in clinical area (ANH, exchange transfusion, therapeutic apheresis, massive transfusion management, clinical consultations etc.), teaching of undergraduate and paramedical students, attending meeting in relation to subject, voluntary blood donor activities etc.

1.2 Time schedule of departmental posting

- **8 AM-9 AM**-Theory session/Seminar/Journal Club/Case presentation & discussion/Group discussion/Guest lecture/Web learning program/any other teaching sort of session
- **9 AM-1 PM**-Rotational posting in above mentioned areas
- **2 PM-6 PM**-Clinical case evaluation and its special investigative workup, training in specialized procedures related to transfusion medicine & immunohaematology etc
- **6 PM-8 AM**-Night duty (Rotation wise)

Training in allied departments/laboratories: 13th -24th month (2nd year)
For allied laboratory and clinical department postings the rotation may be for 12 months, based on the facilities and super-specialties available in the institution/center.

Laboratory area postings: 5 months

- Haematopathology-2 months
- Microbiology-15 days.
- Nucleic Acid Testing lab-15 days
- Molecular diagnostic lab-15 days (Isolation of lymphocytes, CD4/CD8/CD-34 counts using flow cytometry, Immunofluorescence, and other special molecular techniques)
- HLA typing lab-15 days
- Biotechnology wing-1 month

Clinical Department subjects: 7 months

- Medical oncology, PBSCT/BMT & cancer research-2 months
- Clinical Haematology-1 month
- Paediatrics (Neonatology unit, Hematology OPD, Ward, ICU)-1 month
- Anaesthesia and critical care-1 month
- Nephrology and dialysis unit-15 days
- Obstetrics and Labour room-15 days
- Cardiothoracic surgery-15 days

- Therapeutic plasma exchange unit-15 days

Time schedule of training in allied departments / laboratories

- Time schedule will be according to allied lab or clinical department policies

Department of Transfusion Medicine- 25th-36th month (3rd year)

Candidate will be posted as in earlier mentioned sections (**6.1**) in Dept. of Transfusion Medicine.

2.13 Records

Present in clause 2.21.

2.14 Dissertation: As per dissertation regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

2.15 Speciality training if any

As per clause 2.10 of the curriculum.

2.16 Project work to be done if any

As per KUHS regulations & curriculum.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

Present in clause 2.19.

2.19 Reference books

- Blood transfusion in clinical medicine, Ed. Pl Mollison, Blackwell Sci. Pub. Oxford.
- Transfusion Medicine, Ed. WH Churchill, SR Kurtz, Blackwell Sci. Pub. Oxford
- Clinical Practice of Transfusion Medicine, Ed. L Petz, Swisher, Churchill Livingstone, New York,
- Blood transfusion therapy: A problem oriented approach, Ed. JAF Napier, John Willey & sons, Chichester
- Principles of transfusion medicine, Ed. EC Rossi, TL Simon, GS Moss, William & Wilkins, Tokyo
- Modern blood banking & transfusion practices, Ed. Denise M Harmening, 4th edition, FA Davis
- Applied blood group serology, Ed. PD Issit, Montgomerry Sci. Pub. Florida,
- Clinical Blood Transfusion, Ed LA Kay, ER Huehns, Churchill Livingstone, London
- The Human blood groups, Ed PH Anderson, CC Thomas, Springfield, USA
- Fundamentals of immunohematology: Theory & techniques, Ed. ML Turgeon, Lea & Febiger,
- Scientific basis of transfusion medicine: Implications for clinical practice, Ed Anderson, PM Ness, Saunders
- AABB Technical Manual
- Scientific bases of Transfusion Medicine Anderson & Ness
- New Frontiers in Blood Banking (American Association of Blood Banks)
- Infection complications of Blood Transfusion Tabor
- Platelets in Biology and Pathology J.L.Jordon
- Albumin in structure, function and use Rosenoer, Oratx
- Donor Room policies and procedure (AABB)
- Glycoproteins of blood cells and plasma Jamieson & Creen walt
- Problem solving in immuno haematology IRAA Shrlman
- Case studies in transfusion Medicine Lynn K. Hoffstadier, Philip, J Dechristopher, James J Perkins
- Haemotherapy of the infant and premature (AABB)
- An introduction of blood serology Kathlein E.Boorman
- Blood storage and preservation (AABB)
- Fundamentals of apheresis programme (AABB)
- Practical blood transfusion Daughlass W. Huestis, Joseph r Bove.

- Clinical and practical aspects of the use of frozen blood(AABB)
- A Manual of hemotherapy Hasold.B Anstal. Poul M. Urie
- Progression transfusion Medicine John D. Casi
- Special serological techniques useful in problem solving(AABB)
- Plasmapheresis in immunology and oncology JN Bayer, H.Borberg
- Hemotherapy in trauma and surgery (AABB)
- Surgical hemotherapy JA Collins, Stanford C slif
- Clinics in Haematology William Bayer WB sounding company, London
- Recent advances in haematology immunology and blood transfusion S.R.Hollam I.Hernot, G.First
- Safety in transfusion practices Herbert F.Polesky Richard H Willan
- Blood transfusion – A conceptional approach John G. Kelton Mancy M.Heddle
- Advance in blood grouping Vol III, Alexander S. Wiener

STANDARDS AND REGULATORY DOCUMENTS

- DGHS Standards
- Drugs and Cosmetic Act 1940, Amended Drug Rules 1945
- NACO Standards for Blood Banks and Storage Centers
- NABH Standards for Blood Banks and Storage Centers
- NACO Training Modules
- WHO guidelines
- WHO training modules
- AABB Standards
- BCSH guidelines

2.20 Journals

- Vox Sanguinis
- Transfusion
- Transfusion Medicine Reviews
- Transfusion Medicine
- Transfusion and Apheresis Science
- Journal of Clinical Apheresis
- Blood Transfusion
- Blood
- Asian Journal of Transfusion Science
- Indian Journal of Hematology and Blood Transfusion

- Indian Journal of Medical Research

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATION

3.1. Eligibility to appear for exams

- Minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic years.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

Clinical / Practical and Oral

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

SCHEME OF EXAMINATION

- Theory - 400 marks
- Clinical / Practical - 300 marks
- Oral /Viva - 100 marks

1. Theory papers: consist of four papers, each paper of 100 Marks-total 400 marks

2. Pattern of question paper

Each theory question paper will have following pattern

Total 100 marks

- One Structured Essay Question (20 marks)
- Eight short essay questions (10 marks each)

3 Practical examination
Total 300 marks

- **oral/viva=100 marks**
  (80 marks for oral and 20 marks for log book)

- Long case-1 case-1X100 marks=100 marks
- Short Case-2 cases-2X50 marks=100 marks
- Clinical case discussion-5 cases-5X10 marks=50 marks
- Spotters-10 numbers-10X5 marks=50 marks

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.1 Laboratory and clinical skills (long case & short case)

Some examples are given below.

- Blood donor / apheresis donor selection
- Component processing
- Immunohematology
- Antenatal serology
- Transfusion reaction management
- Quality control of reagents, equipment, components
- Coagulation testing
- Basic hematology tests
- Transfusion transmitted infection screening

The duration of each exercise shall vary from 1-2 hour. Each exercise or Station shall be followed by discussion on the particular exercise.

Performance of the student is evaluated using the following criteria:

- Familiarity with the procedure.
- Setting up and performing the procedure (organizational skills).

- Appropriate specimens and reagents are obtained and utilized.
- Proper use of equipment, reagents, supplies and specimens.
- Proper labelling, handling and disposal of specimens, tubes, etc.
- Organization and performance of individual tasks.
- Completion of tests within a reasonable amount of time.
- Clean-up of work area.
- Correct interpretation of results with recognition of discrepancies or abnormal results.
- Results are recorded and reported in proper format.

3.2 Clinical case discussion (5 cases)

There should be 5 hemotherapy exercises/administrative issues for each candidate. The candidate is required to make his or her own assessment of the problem and come out with solutions. Each case carries 10 marks, total 50 marks.

3.3 Spotters (10 numbers)

The candidate will be given 10 stations with 3-5 minutes on each station. The candidate will be required to answer on each situation. Each station carries 5 marks, total 50 marks.

3.4 Grand viva

Grand viva include viva voce & micro teaching (80 marks), log book evaluation (20marks) -100 marks

3.4.1 Viva voce

Viva covering main areas of transfusion medicine to assess the depth of knowledge that student has attained during course period.

3.4.2 Communication/presentation skills (micro teaching)

The candidate will be required to present his/her dissertation/thesis in power-point format for 10 minutes. The candidate will be examined on the presentation style, communication skill, slide design and content.

Viva voce and microteaching together carries 80 marks

3.4.3 Log book evaluation

To assess the involvement of candidate in academic, administrative, clinical and research activities during MD Transfusion Medicine course period based on evaluation of log book.

Log book evaluation carries 20 marks

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

Paper I -Applied aspects of basic sciences in relation to Transfusion Medicine

Paper II -Immunohaematology, Immunogenetics and Applied serology

Paper III -Blood centre operation, blood donor organisation, blood preservation and technology of components and clinical hemotherapy.

Paper IV-Recent advances in transfusion technology and hemotherapy

3.6 Model question paper for each subject with question paper pattern

Paper I-**Applied Aspects of Basic Sciences in Relation to Transfusion Medicine**

Time: 3 hrs **Max marks:100**

Essay: (20)

1. Explain in detail about the structure, function and metabolism of platelets. Add a note on platelet preservatives.

Short essays: (10x8=80)

2. Types of lymphocytes and its function.

3. Red cell glucose metabolism and the importance of G6PD enzyme.

4. Pathophysiology and laboratory features of intravascular and extravascular haemolysis.

5. Mendelian law of inheritance

6. Pathophysiology of disseminated intravascular coagulation.

7. Discuss the complement system and its applied importance in transfusion medicine.

8. Secretor status and its application.

9. High titre low avidity antibody .

Paper II - **Immunohaematology, Immunogenetics and Applied Serology**

Time: 3 hrs **Max marks:100**

Essay: (20)

1. Describe the requisite elements of pre transfusion testing and explain how the pre transfusion test differs between conventional cross matched blood and units released by electronic cross match.

Short essays: (8x10=80)

2. Ii antigen system.

3. Poly agglutination.

4. Elution procedures and its application.

5. "Levey-Jenning chart" and its application in transfusion medicine.

6. "Window Period" and "Residual Risk".

7. Weak D and partial D antigens.

8. Chimerism

9. Mechanisms of drug induced haemolytic anemia.

Paper III -Blood centre operation, blood donor organization, blood preservation and technology of components and clinical hemotherapy.

Time: 3 hrs **Max marks:100**

Essay: (20)

1. Discuss the various transfusion regimens for thalassemia major patients. How will you organize transfusion support in these patients based on their special needs.

Short essays: (8x10=80)

2. Strategies to improve voluntary blood donation in India

3. Leucoreduction

4. Prophylactic platelet transfusion

5. Red cell additive solutions

6. Therapeutic plasma exchange

7. Cryopreservation of red cells

8. Transfusion related acute lung Injury

9. Quality control for ELISA testing for transfusion transmissible viral infections

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Paper IV-Recent advances in transfusion technology and hemotherapy

Time: 3 hrs Max marks:100

Essay: (20)

1. Discuss the viral inactivation techniques for various blood components and mention their current status for use in transfusion services.

Short essays: (8x10=80)

2.Recombinant coagulation factors

3. Prion disease

4. Platelet substitutes

5. Computer cross-match

6. Cord blood banking

7. Universal red cells

8. Molecular epidemiology of HGV and its significance

9. Principles of flow cytometry and applications in transfusion medicine

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

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Clinical / Practical and Oral

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case

may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Other details as mentioned in "scheme of examination"

3.9 Number of examiners (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

As mentioned in clause 2.10 and 3.4

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

REGULATIONS 2016

Syllabus

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD EMERGENCY MEDICINE

Course Code 224

(2016-17 Academic year onwards)

2016

2. COURSE CONTENTS

2.1 Title of course:

M.D. Emergency Medicine

2.2 Objectives of course

GENERAL GOALS OF THE RESIDENCY TEACHING CUM TRAINING PROGRAM IN M.D EMERGENCY MEDICINE

The main goal of the training program is to produce Emergency physicians with the necessary knowledge, skill and attitude to diagnose and manage in an effective manner, a wide range of clinical problems in Emergency medicine as seen in the community or in secondary/tertiary care setting. Special emphasis is placed on the relatively common emergencies and treatable disorders. Possession of clinical skills required for making a diagnosis is given utmost importance.

As a result of training in Emergency Medicine, the Emergency physician should become competent in life saving emergency interventions, the use of the various diagnostic tests, and interprets their results intelligently & promptly.

In addition, trained Emergency physician should possess knowledge and skills of all the medical and surgical specialty and appropriately deliver to save the critically ill patient within the golden hour..

It is considered desirable for the post graduate residents from this specialty to be familiar with the fundamentals of research methodology also.

In order to be considered a competent internist, a resident in Emergency medicine must possess humanistic qualities, attitudes and behavior necessary for the development of appropriate patient-doctor relationship.

SPECIFIC AIMS AND OBJECTIVES OF THE RESIDENT TRAINING PROGRAM IN EMERGENCY MEDICINE

As a result of the training under this program, at the end of 3 years of postgraduate training, a resident must acquire the following knowledge, skills and competencies:

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1. A thorough knowledge of pathological abnormalities, clinical manifestations, and principles of management of a large variety of medical and surgical emergencies of pediatrics, adults and geriatrics, affecting any organ system.

2. Skill and competence to choose and interpret correctly the results of the various routine investigations necessary for proper management of the patient. While ordering these investigations, a resident must be able to understand the sensitivity, specificity and the predictive value of the proposed investigation, as well as its cost-effectiveness in the management of the patient.

3. Skill and competence in emergency interventions like endotracheal intubation, needle cricothyrotomy, tracheostomy, needle thorococentesis, Intercostal drain placement, and pericardiocentesis, defibrillation, so on and so forth.

4. Skills and competence to perform commonly used diagnostic procedures, namely, lumbar puncture, bone marrow aspiration/biopsy, liver/nerve/ muscle/ skin/ kidney/ pleural biopsy, fine needle aspiration cytology of palpable lumps, pleural/pericardial/abdominal/joint fluid aspiration.

5. Skill and competence to choose and interpret correctly the results of specialized investigations including radiologic, ultra-sonographic, biochemical, hemodynamic, electro-cardio graphic, electrophysiological, pulmonary functional, haematological, immunological, nuclear isotope scanning and arterial blood gas analysis results.

6. Skill and competence to provide consultation to other medical and surgical specialties and sub-specialties, whenever needed.

7. Skill and competence to function effectively in varied clinical settings, namely emergency/critical care, ambulatory care, out-patient clinic, in-patient wards.

8. Skill and competence to take sound decisions regarding hospitalization, or timely referral to other consultants of various medical sub specialties recognizing his limitations in knowledge and skills in these areas.

9. Proficiency in selecting correct drug combinations for different clinical problems with thorough knowledge of their pharmacological effects, side-effects, interactions with the other drugs, alteration of their metabolism in different clinical situations, including that in the elderly.

10. Skill and competence to advise on the preventive, restorative and rehabilitative aspects including those in the elderly, so as to be able to counsel the patient correctly after recovery from an acute or chronic illness.

11. Skill and competence to understand research methodology in Emergency medicine and to undertake a critical appraisal of the literature published in various emergency medical journals and be able to apply the same in the setting in which the resident is working.

12. Skill and competence to work cohesively in Resuscitation team along with paramedical personnel and maintain discipline and healthy interaction with the colleagues.

13. Skill and competence to communicate clearly and consciously, and teach other junior residents, medical students, nurses and other paramedical staff, the theory as well as the practical clinical skills required for the practice of Emergency medicine.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

As per clause 2.10.

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

As per clause 2.10.

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

As per clause 2.11.

2.8 Branches if any with definition

Not applicable.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the

expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.

- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.

- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

  - The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University. This log book will be assessed by the postgraduate Guide of the student and will be jointly evaluated by the Guide & Head of the Department.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.

- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.

- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.
2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.

2. Data collection for dissertation and writing the dissertation.

3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.

4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to within

the first 6 months from the commencement of the course or as notified by the university in the calendar of events, to the Registrar.

Submission of dissertation

The dissertation shall be submitted to the Registrar (Evaluation) of the University six months prior to the final examination or as notified in the calendar of events. **Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.**

2.10 Content of each subject in each year

YEAR I

Introduction and preliminary posting in the Emergency Room	4 months
Posting in Anaesthesiology	1 month
Posting in Medical Intensive Care Unit	2 months
Surgical Intensive Care Unit	2 months
General Medicine / Medical Intensive Care Unit	1 month
General Surgery/ surgical Intensive Care Unit	1month
Orthopaedics/ surgical Intensive Care Unit	1month
Primary examination in Basic Medical Sciences	

YEAR II

1. Emergency Room	8 months
2. Community Health	1 month
3. Paediatrics / PICU	3 months

YEAR III

Emergency Room	9 months
Psychiatry	1 month
Gynaecology and Obstetrics / Labour ward	1 month
ENT	15 days
Ophthalmology	15 days

2.11 No: of hours per subject

As given under clause 2.10

Total Hours Available 1680 hours.

Besides interactive lectures theory includes Induction, documentation, Orientation, Journal Club, Internal Examination and Final Examination.

Total duration of training program 3 Years

2.12 Practical training given

Airway (C-spine control)

A Basic airway management
B Advanced airway management (tracheal intubation/alternatives)
C Difficult Intubation. (Bougies, Introducers etc)
D Surgical Airway.

Breathing

A Needle/tube thoracostomy
B Ventilation techniques (including non-invasive)

Circulation

Cardiopulmonary Resuscitation Training

A Cardio version / Defibrillation / Trans cutaneous pacing / Transvenous pacing.
B ECG interpretation
C Central venous access. (IJV, Subclavian, Femoral)
D Arterial access

E CVP monitoring
F Intra-osseous access
G Pericardiocentesis

Splinting/Immobilisation

A Spinal immobilisation
B Limb splinting/Traction splints
C Logroll
D Helmet Removal.
E Extrication.

ENT

A Indirect laryngoscopy
B Nasal packing
C Epistaxis.

Maxillo-facial

A Dental anaesthesia
B Dental socket suture
C Plastic surgery techniques

Reduction of Fractures/Dislocations (Local and regional anaesthetic Techniques/pain relief)

Toxicology

Use of Antidotes.
Gastric Lavage/Activated charcoal.

Ophthalmological Procedures

Slit Lamp Examination.

Ocular Foreign Body Removal.

Interpretation of laboratory investigations

Imaging interpretation (Ultrasound/CT/MRI included)

Major Trauma Management and team leader function

Focussed Assessment of Sonography in Trauma.

Wound Management

A Types of wounds/extremity examination
B Wound preparation
C Wound closure techniques
D Foreign bodies
E Extensor tendon repair
F Incision of abscesses and pulp space infections

G Flexor tendon sheath infections (including palmar spaces)
H Finger tip injuries
I Dressing techniques
J Plaster and immobilisation techniques
K Joint aspiration, soft tissue infection
L Reduction of Fractures and dislocations.
M Pelvic stabilization techniques.

Anaesthetic techniques

Transportation of Patient

2.13 Records

As per clause 2.21.

2.14 Dissertation: As per Dissertation Regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be re evaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

The 480 hours available should be fruitfully utilized by the student for attending conferences / CME programmes and for thesis writing and case study. Apart from this they can utilize these hours for creating basic awareness of emergency medicine among the other specialties and common masses.

2.15 Speciality training if any

As per clause 2.12.

2.16 Project work to be done if any

As per direction of the Head of Department.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

1) Emergency Medicine – Concept and Clinical Practice –IX Edition,Rosen

2)Emergency Medicine – A comprehensive Study Guide – VIII edition. – Judith Tintinalli

3)Principle and Practice of Emergency Medicine – Schwartz
4) Emergency Medicine – Hamilton
5)Essential of Immediate Medical Care, II Edition – Dr. C. John Eaton Clinical
6) Management of Drug Overdose and Poisoning - Haddad, Shannon,
7)Emergency Department Management Principles and Application - Richard
8)The Five Minute Emergency Medicine Consult - Rosen
9) Disaster Medicine - David E Hugan
10)Text Book of Pediatrics. Emergency Medicine – FLEISHER
11)Drugs Therapy in Emergency Medicine - Joseph P. Ornato Edgar R.
12)Bailey's 1995 - Emergency Surgery - BW Ellis
13)Davidson's Principles and Practices of Medicine
14)Clinical Medicine - Kumar & Clark
15)Harrison’s Principles of Internal Medicine
16)Text Book of Critical Care – VI edition – Shoe
17) Text Book of Critical Care – Fink
18)Gold frank’s Toxicological Emergencies – X edition
19)Emergency procedures by Roberts & Hedges.
20)Emergency medicine procedure by Eric
21) Atlas of Emergency medicine By Kevin
22)ABC of resuscitation by MC Colguhoon., A J handley.
23)Emergency orthopaedics’ by Robert S Simon.

24)Current, diagnosis, treatment – critical care by Frederics

25)Textbook Of Surgery By Bailey & Love

26)Washington Manual of Critical care.

27)The ICU Book By Paul Marino

28)Mechanical Ventilation by David .

29)ICU manual By Irwin Rippe.

30)Advanced Trauma Life Support Manual

31)Circulation- American Heart Association

32)Basic Life Support Manual AHA

33)Advanced Cardiac Life Support Manual

34) Paediatric Advanced Life Support AHA.

35)Neonatal Advanced Life Support Manual

36)Paediatric Emergency Medicine: A Comprehensive Study Guide by Gary R. Strange, William R. Ahrens, Steven Lelyveld, William Ahrens- McGraw-Hill Professional;

37)Emergencies in Obstetrics and Gynaecology (Oxford Handbooks in Emergency Medicine, by Lindsey Stevens - Oxford University Press)

38)Principles of Critical Care by Jesse B. Hall, Gregory A. Schmidt, Lawrence D. H. Wood- McGraw-Hill Professional Publishing

39)Critical Care by Joseph M. Civetta, Robert W. Taylor, Robert R. Kirby- Lippincott Williams & Wilkins

40)Emergency Medicine: Topics and Problems for Students by Jelinek- Blackwell Science Ltd

41)Accidents and Emergencies in Children (Oxford Handbooks in Emergency Medicine)

42)Acute Medical Emergencies by Ursula Guly, Drew Richardson- Oxford University Press

2.19 Reference books

Present in clause 2.18.

2.20 Journals

1. Emergency medical journal BMJ

2. Canadian journal of emergency medicine
3. Annals of Emergency Medicine
4. Paediatric Emergency Medicine journal
5. Journal of accident and Emergency Medicine
6. The American journal of Emergency Medicine

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

3. EXAMINATION

3.1 Eligibility to appear for exams

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination).**

The examinations shall be organised on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

1. There shall be four theory papers.

2. Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that specialty.

3. The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each specialty. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree

Theory 400 marks

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40										
2	Paper II	100	40										
3	Paper III	100	40	**400**	**200**	**300**		**100**		**400**	**200**	**800**	**400**
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable

3.5 Details of theory exams

Duration – 3 hours each paper

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

- **Paper 1** Applied basic Sciences, General Emergency Medicine, Disaster preparedness
- **Paper 2** Infectious Disease, HIV and AIDS, CVS, GIT, Critical care, Paediatrics, Environmental Emergencies, Toxicology
- **Paper 3** Respiratory Medicines, CNS, Surgical Emergencies, Obstetric & Gynaecological Emergencies, Surgical Specialties, Procedures.
- **Paper 4** Nephrology, Endocrinology, Haematology, Oncology, psychiatry, dermatology, Occupational Diseases and Recent advances

3.6 Model question paper for each subject with question paper pattern

QP Code: **Reg.No**

MD Degree Examinations in Emergency Medicine

(Model Question Paper)

Paper I - Applied Basic Sciences, General Emergency Medicine

Time: 3 hrs

Max marks:100

•Answer all questions

•Draw diagrams wherever necessary

Essays: (20)

1. Discuss normal cardiac conduction system. Discuss indications and techniques of emergency pacing.

Short essays: (8x10=80)

2. Steps of rapid sequence intubation
3. Procedural sedation and analgesia in the emergency department
4. ACLS Guidelines for management of tachycardia
5. Foreign body obstruction – BLS management
6. Hospital emergency operation plan
7. Pharmacology of anti arrhythmic used in emergency department
8. Principles of wound evaluation in emergency department
9. Physiology of closed chest compressions

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QP Code: **Reg.No.:.....**

MD Degree Examinations in Emergency Medicine

(Model Question Paper)

Paper II – Infectious Disease, HIV and AIDS, CVS, GIT, Critical Care, Paediatrics, Environmental Emergencies

Time: 3 hrs

Max marks:100

•Answer all questions

•Draw diagrams wherever necessary

Essays: (20)

1. A 45 years old male farmer was brought to emergency department, who was diaphoretic, with frothing from mouth. His heart rate was 40/ minute, systolic BP of 60 mm of Hg, and pinpoint pupils. Identify the toxidrome and explain its management in emergency department.

Short essays: (8x10=80)

2. Necrotizing soft tissue infections.
3. Aortic dissection.
4. Tricyclic antidepressant poison
5. Postexposure prophylaxis of rabies
6. Acute bronchiolitis in a child.
7. Hyperkalemia.
8. Enumerate the causes of stridor in children and explain the management of epiglottitis.
9. Snake bite –management.

****

QP Code: **Reg.No:**

MD Degree Examinations in Emergency Medicine

(Model Question Paper)

Paper III – Respiratory Medicine, CNS, Surgical Emergencies, Obstetric & Gynaecological Emergencies, Surgical Specialities, Procedures

Time: 3 hrs

Max marks:100

•Answer all questions

•Draw diagrams wherever necessary

Essays: (20)

1. 22 years old female was brought to emergency department at 6 am with complaints of breathlessness. She is a known case o
bronchial asthma since her childhood. Discuss your approach and management of this patient in emergency department.

Short essays: (8x10=80)

2. Postpartum haemorrhage.
3. Peri mortem caesarean section.
4. Shoulder dislocation –management in ED.
5. Acute urinary retention.
6. Bowel obstruction- ED approach
7. Meningitis.
8. Temporomandibular joint dislocation.
9. Incomplete spinal cord syndromes.

****

QP Code: **Reg.No:**

MD Degree Examinations in Emergency Medicine

(Model Question Paper)

Paper IV – Nephrology, Endocrinology, Haematology, Oncology, Psychiatry, Dermatology, Occupational diseases and Recent advances

Time: 3 hrs

Max marks:100

•Answer all questions

•Draw diagrams wherever necessary

Essays: (20)

1. Describe the new diagnostic criteria for AKI. How will you investigate and manage a case of AKI in ED.

Short essays: (8x10=80)

2. Approach to a violent patient in ED.
3. Myxoedema coma.

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4. Surviving sepsis campaign guidelines.
5. Acute adrenal insufficiency.
6. RUSH protocol.
7. High altitude pulmonary edema.
8. Intimate partner violence.
9. Warfarin induced bleeding management.

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3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical practicum exams

- *Clinical / Practical and Oral*

1. Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each specialty. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

2. The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

3. The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Clinical / Practical 300 marks

Practicals: Total 300 marks

5 cases

1. Medicine: 2 cases: 80 marks
2. Surgery: 1 case: 40 marks
3. Trauma: 1 case: 40 marks
4. Paediatrics 1 case: 40 marks

200 marks

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OSCE Station – 10 x 10 = 100 marks

1. Airway management skills
2. ECG rhythm identification and management
3. ABG reading interpretation management
4. Advanced cardiac life support station
5. Paediatric advanced life support station
6. X ray and CT reading
7. Drugs used in Emergency department
8. Ventillator setting
9. Skill station for breathing problems – Pneumothorax, Haemothorax
10. Skill station for circulation problems – shock cardiac tamponade

3.9 Number of examiners needed (Internal & External) and their qualifications

Examiners

1. All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

2. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

(mark of log book to be included hence to be revised)

Oral: 20 x 4 -80 marks

Viva: 4 stations

1. Instrument
2. Thesis
3. BLS
4. Triage

Log Book – 20 marks

Total – 100 marks

Viva-voce/Skill assessment

1. ECG
2. Emergency Radiology (x-rays/ CT)
3. Emergency Sonography(FAST/USG)
4. Instruments
5. Ventilatory settings
6. BLS
7. Airway and breathing skills(intubation, LMA, needle Cricothyroidotomy, diagnosed ventilation, needle thorococentesis)
8. Skills related to circulation(central venous excess, intraosseous excess, central venous pressure management)
9. Arrhythmia recognition and management (defibrillation, Cardioversion and temporary pacing)
10. ABG

4. INTRRNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum

REGULATIONS 2016

Syllabus

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

POST GRADUATE DEGREE IN MEDICINE

MD FAMILY MEDICINE

Course Code 225

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

M.D. Family Medicine

2.2 Objectives of course

Preamble:

The Indian health care scenario is very complex and heterogeneous covering a range from world-class private tertiary care facilities to deplorably inadequate public services at all levels, including primary disease care. A system to provide affordable, accessible and effective health care and disease care to all the citizens of the nation is an urgent requirement of the country. There is ample evidence from around the world that any health care system based on a strong foundation of primary care and Family Medicine/ General Practice is crucial to achieve this goal. A well-trained Family medicine practitioner with a specialist degree can bring much-needed improvement in health delivery by offering comprehensive, integrated medical care right across all the age and illness spectrum at a much lower cost than is happening at the current time. The foundation of patient-centred medicine, which focuses on the person of the patient and builds a long-term relationship, will also play a part to address the issues of loss of trust in the medical profession that is happening today. The network of Family Medicine/ General Practice specialists with other primary care providers not only ensures early diagnosis and effective treatment, but also goes beyond treating diseases to providing a system to keep the community healthy. The Ministry of Health and Family Welfare recognized this in 2002 when it was recommended that at least 25% of all post graduate training seats should be in Family Medicine and that no new postgraduate seats should be started in any medical college unless this condition was fulfilled.

However, only one medical college in the country (Government Medical College, Calicut) has a 3 year MD in Family Medicine today. The Diplomat of the National Board offers a 3 year postgraduate course in the specialty. There is therefore a need for university-run Family Medicine departments, which will run accredited courses to produce specialists who will be accepted right across the patient community for delivering comprehensive primary health care.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Goal

The broad objectives of the course will be that, after qualifying the final examination, the candidate should be able to function as specialist in Family Medicine, rendering primary and secondary health care services to the community and to all members of a family registered with them, becoming the first contact family doctor and that the doctor concerned would become friend, philosopher, and guide to the families registered under them.

The objectives include:

- Promotion of health and prevention of diseases in the families under his/her care.
- Effective medical management of common diseases in all age groups, in various clinical specialties, within the limited resources of family practice setting.
- Identification of red flag signs and symptoms in any disease or health problem and their appropriate management or referral.
- Co-ordination of care with the specialists, follow up, continuity of care, domiciliary care, and palliative care.
- Awareness and implementation of National Health programmes.
- Ability to care for disadvantaged groups in the community such as the elderly, mentally and physically handicapped persons.
- Application of behavioral sciences related to family practice to develop a healthy relationship inside the family.
- Effectively communicate with patients, family, colleagues and other health care workers in the community.
- Management of a wide range of common medical emergencies in the context of family practice, with evidence-based medicine.
- Develop ability to take decisions on appropriate and cost-effective use of investigations and interpret the results of these investigations.
- Effectively manage staff and equipments and learn stock/account keeping.

- Develop ability to solve patient problems within a particular socio-cultural setting, harnessing available community services.
- Be a role model in behavior and able to organize community care programmes, focusing on promotion and maintenance of health of the family and the community in general.
- Acquire competency in legal certification and documentation.
- Acquire competency in medical record keeping and data management.
- Able to conduct research and submit the results as thesis.

SUBJECT SPECIFIC COMPETENCIES

The functioning of a family physician is based on nine core principles as listed below:

1. Person centred care
2. Family oriented care
3. Community based care
4. Comprehensive care
5. Continuous care
6. Health promotion and disease prevention
7. Collaborative, coordinated team based care
8. Resource management and health advocacy
9. Lifelong self-learning

To achieve this, the training must include these seven major competencies:

1. **Family medicine clinical expert**
2. **Scholar**
3. **Social outlook and responsibilities**
4. **Collaborator and coordinator**
5. **Leader**
6. **Communicator**
7. **Professionalism**

A. Cognitive & Pyschomotor domain

1. Family medicine clinical expert:

This is defined as the ability of the physician to provide comprehensive and continuous clinical care during acute and chronic conditions to a population with wide variety of clinical problems.

The post graduate should also be able to:

a) handle the *whole spectrum of diseases* presenting in the community at primary care level, both chronic and acute, affecting all age groups, including emergency and elective problems.
b) deal with *undifferentiated problems*, form provisional diagnoses, and formulate management decision plans in a step-wise manner, based on evolution of the clinical problem.
c) deal with *multiple co-morbidities* in a variety of clinical situations. This will often involve integrating care between the family physician and many specialists, as well as between specialists.
d) make logical and appropriate decisions regarding *referral to tertiary care* centres, acting as a gatekeeper to tertiary care (aids in preventing fragmentation of care, as well as escalation of cost of care).
e) employ a *patient-centred approach*, in contrast to a "disease-centred approach" in which the illness is dealt with in the specific patient's unique socio-cultural context and which incorporates a bio-psycho-social model of disease.
f) practice a *multi-disciplinary approach to health-care*, and work as a leader of the health team comprising of JPHN/ ASHA (Junior Public Health Nurse/Accredited Social Health Activist), physiotherapists, nurses, occupational therapists, as well as trained attendants.
g) provide *continuity of care* by engaging in a two-way referral network between primary/secondary and tertiary levels, as well as by organizing an efficient access to health care facility.
h) provide community oriented care to the defined population served by them.
i) provide family oriented care to the individuals/families served by them.
j) be involved in health promotion, disease prevention, rehabilitation and palliation.

The student should be able to elicit clinical history and performing a comprehensive physical examination and demonstrate problem-solving competencies like:

a) ability to generate an initial list of differential diagnoses given a specific chief complaint and patient characteristics.

b) ability to re-rank the differential diagnoses based on information gathered from the history, physical, and auxiliary studies.

c) ability to explain a mechanism for each aspect of a patient's problem, including biological, behavioral, and social aspects.

d) ability to evaluate scientific/clinical information and critically analyze conflicting data and hypotheses.

e) ability to identify and find information relevant to the clinical problem from texts books, journals and electronic media

f) ability to organise medical record keeping.

g) be well versed in *principles of bioethics, legal matters pertaining to health care, gender issues, social and cultural beliefs of the community.*

h) Continue to keep *up to date with new information* in all branches of clinical medicine with special relevance to primary care.

i) be committed to cost-effective patient care.

j) Able to organize medical data in oral and written presentations.

k) Demonstrates use and interpretation of diagnostic procedures and laboratory data.

2. Scholar

The student should demonstrate a lifelong commitment to excellence in practice through continuous learning and teaching of others and be able to:

a) analyse the quality and implications of medical literature and apply new knowledge in the delivery of health care.

b) identify future areas of inquiry in medical research.

c) demonstrate enthusiasm and positive attitude in the educational process and participate fully in educational activities.

d) demonstrate familiarity with research methodology, epidemiology and information technology skills.

e) plan protocol of thesis, its execution and thesis writing.

f) review literature on evidence based medicine

g) conducts clinical sessions for undergraduate medical students, nurses and paramedical workers.

h) write and present a paper

i) collect and analyse primary and secondary data and perform simple descriptive and inferential statistical analysis.

3. Social outlook and responsibilities

This involves the ability of the physician to demonstrate an awareness of the larger context of the patient's problems, the social, cultural and environmental issues behind the diseases and the social and financial issues involved in management of the diseases; these include:

a) ability to engage the patient family in diagnosis and therapeutic treatment planning, treatment planning and recognizes its social and economic impact.

b) practical, efficient and cost effective approach to diagnosis and management, cost awareness and cost effectiveness in choosing the health care delivery options

c) knowledge of health care costs, and is able to discuss sources of health-care financing.

d) knowledge of evidence based medicine in making patient management decisions.

e) in-depth knowledge of national health programmes, and the epidemiology of common diseases and utilizes it in provision of health care for the individual and family.

f) understanding of different levels of health care systems and facilitates transition of care within the health system

4. Collaborator / coordinator

This is defined as the ability of the family physicians to work with patients, families, health care teams, other health professionals, government agencies and communities to achieve optimal patient care and education in a multi-professional environment and includes:

a) understanding of the roles and competencies of other health care professionals and is able to work with them in a team approach.

b) ability to sustain a relationship of trust and mutual respect with all the stakeholders.

c) ability to engage patients and their families as active participants in health care.

d) ability to collaborate with other professionals in training of health professionals.

e) ability to follow up and coordinate care of patients when referred to other professionals and when at home.

5. Leader

The physician should develop a personal vision and a collective vision in collaboration with other health care leaders, of a high quality health care system and to take responsibility for effecting change to move the system toward providing optimum health care. The leader should be a team player, a steward of financial, human and material resources, a planner of resources and careers and prudent self management of own health, career, personal life and choices. The family doctor should strive to be a visionary demonstrating leadership skills and is able to respect the role of colleagues and other team members. Plans for day-to-day functioning of the department such as duty lists, work schedules etc. Recognizes the importance of allocation of healthcare resources, balancing effectiveness, efficiency and access with optimal patient care.. Plans and allocates the resources available for health care. Initiates and participates in quality improvement processes in the area of practice (e.g. audits).

B. Affective domain

1. Communicator:

The student should have good communication skills, to be able to communicate with family members, health professionals and the community, including:

- Use of patient-centred interviewing techniques during consultations
- Provides effective education, counselling and guidance
- Promotes patient health behaviour change at every opportunity
- Demonstrates adaptable and flexible communication style
- Interacts effectively with allied health professionals so that multi-disciplinary care is delivered in a seamless comprehensive manner
- Demonstrates ability to communicate bad news and deal with conflict situations effectively.
- Demonstrates competence in *communicating effectively* with patients, relatives and with other members of the health team as outlined below:
    - knowledge of family and support systems,
    - identifying and addressing ethical, cultural, and spiritual issues associated with health care delivery

- understanding of psychological, social, and economic factors which are pertinent to the delivery of health care.
- Able to assess a patient's ideas, concerns and expectations about the illness and in accessing the health care system.

2. Professionalism and work ethics:

- Accepts personal responsibility for care of one's patients, consistent with good work ethics and empathy.
- truthfulness and honesty with colleagues, respect for colleagues and team members
- behaviour that reassures everyone that the physician is responsible, reliable, and trustworthy.
  - knows his or her limits of clinical competence and seeks help appropriately.
  - make sure that his/her personal beliefs and prejudices do not come in the way of providing service.
- Respecting patient confidentiality at all times in verbal and written communication with others.
- flexibility, open-minded approach when dealing with uncertainty.

C. Psychomotor domain

At the end of the course, the student should have acquired the following psychomotor skills:

General Medicine

At the end of the course, the family physician should be able to perform the following skills with special reference to the following procedures, which can be done in a community health centre

1. Cardio-pulmonary resuscitation: adults and children
   a. Basic life support and advanced cardiac life support , stabilisation and referral
   b. Use of defibrillator including Automatic external defibrillator
2. Interpret an ECG, and X-ray of chest, abdomen, spine and limbs, basic antenatal ultrasound; understand the indications for CT scan and MRI, and be able to act on their reports. lumbar puncture
3. Chest-tube drainage with under-water seal,
4. Abdominal paracentesis
5. Pleural fluid aspiration
6. Naso-gastric intubation
7. Intravenous access,

8. Urinary bladder catheterization,
9. Estimation of haemoglobin, total count, differential count, ESR, preparing and staining of blood smears, AFB, lumbar puncture, cerebrospinal fluid examination.
10. Health Promotion/ disease prevention for the following
11. Maintain accurate records of all patient consultations, procedures and outcomes.
12. Record of Family Profiles – Candidates will maintain the profiles of at least five families in which at least one member of the family has a health problem, eliciting its impact on the family and the role of family, taking into account their social, cultural and economic background
13. The student should be able to educate all patients, independently or in liaison with health care professionals on the following general aspects of health promotion:

- Nutrition, the concept of balanced diet
- Exercise
- Smoking cessation
- Alcohol DE addiction
- Stress reduction
- Screening for diseases

<u>Child health</u>

- intravenous access
- lumbar puncture
- neonatal resuscitation
- assessment of the newborn
- Assessment of nutritional status and management of the malnourished child including preparation of a diet sheet
- Use the IMNCI guidelines to manage childhood diseases
- Management of common childhood emergencies including seizures, burns, poisoning,

dehydration, acute severe breathlessness.

Adolescent health

- History taking for adolescents
- Assessment and management of common behavior problems in adolescents with appropriate referral

General Surgery:

- The recognition and evaluation of conditions requiring surgical diagnosis and procedures;
- Management and appropriate referral of primary surgical emergencies including burns, haemorrhage, shock, sepsis, acute abdomen, head injuries.
- Management of minor trauma, injuries, including immediate and resuscitative treatment of acute injuries, management of electrolyte and fluid requirements, blood transfusion.
- Foreskin dorsal slit
- Fine needle aspiration cytology (FNAC),
- Proctoscopy,
- Incision & drainage abscess
- Suturing, wound dressing/bandage,
- Circumcision,
- Reduction of paraphimosis,
- Vasectomy,
- Hydrocelectomy,
- excision and biopsy of superficial swellings,
- Venesection,
- Suprapubic cystostomy,

Orthopaedics:

- Emergency care of patients with multiple injuries, transportation of trauma patients, splinting, application of casts, diagnosis and management of injuries, sprains, control of external haemorrhage , fractures and dislocations with proper referral.

  Management of Colle' s fracture , fracture clavicle, shoulder dislocation

- Provide health education for prevention of injuries.

Maternal and Women's Health

- Antenatal care
- Conduct of a normal delivery
- Detect high-risk ante-natal cases, and perform LSCS or refer when necessary
- Vacuum and forceps delivery
- Manage post-partum haemorrhage and refer appropriately
- Care of the new-born
- Pap smear
- Cervical and endometrial biopsy
- Dilatation and curettage
- Insertion and removal of IUCD
- Provide contraceptive advice
- Medical termination of pregnancy.

Community Health:

Investigation of an epidemic

Implementation of National health programs

Provide health education for schools, health workers and the community

Otorhinolaryngology:

- removal of wax from external auditory canal , foreign body removal, nasal packing, Ear lobe repair, ear syringing, tracheostomy, cricothyroidotomy

Ophthalmology:

- Fundus examination with an opthalmoscope,
- Vision screening
- Epilation
- Removal of superficial foreign body.
- Fluorescent dye examination of cornea

Dermatology:

Minor surgical procedures in dermatology including electrocautery, chemical cauterization, skin-biopsy.

Geriatrics:

Assessment for risk of falls

Assessment and management of depression in the elderly patients

Management of the agitated elderly patient

Mini Mental Status Examination

Comprehensive geriatric assessment

Physical medicine and rehabilitation :

Co-ordinate the following rehabilitation and palliation care aspects with respective health care professionals.

- Stroke rehab
- Cardiovascular rehab
- Post-trauma rehab
- Musculoskeletal diseases
- Assessment and management of patients with disabilities
- Prevention and management of bed sores

Pain and palliative care:

- Management of common symptoms in terminally ill patients and its management,
- management of pain,
- Provide end of life care,
- Management of grief,
- Communication skills
- Breaking bad news

Emergency medicine:

- Initiate management of patient in shock, status epilepticus, poisoning, acute respiratory distress, coma

- Skills for life-saving procedures in medical, obstetric, paediatric, including neonatal resuscitation, surgical and trauma emergencies
- Management of common emergencies seen in family practice including cardio - vascular, respiratory, gastrointestinal, neurological, metabolic and others like snake bite and heat stroke
- Basic and advanced life support, cardio-pulmonary resuscitation,
- Endotracheal intubation,
- Intravenous access (peripheral and central lines, venesection, intravenous infusion);
- Disaster management.

Anaesthesia

Administer local, spinal and regional anaesthesia including field , digital , wrist, penile and ankle blocks

Mental health

- Recognition and management of depression and anxiety states
- Recognition and referral of patients with psychosis
- Follow-up care of patients with psychosis
- Care of patients with unexplained symptoms without organic basis
- Care of patients undergoing bereavement, social and family stress
- Diagnosis, detoxification and team based management of patients with substance abuse
- Assessment of suicide risk

Medical jurisprudence:

Document injuries

Provide appropriate medical certificates

Academic skills

- Collect and analyse primary and secondary data and perform simple descriptive and inferential statistical analysis.
- Read and analyse published literature pertaining to primary care.
- Teach undergraduate students and allied health professional students.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

The present undergraduate medical curriculum and the internship are inadequate to turn out well trained and competent medical professionals to serve the community needs. Preventive, promotive and rehabilitation aspects, which form an integral part of healthy living, have lost focus with most of the medical practitioners. More than 80% of our population comprises of either the rural or urban poor. They are unable to get access to adequate medical care facilities from the exiting hospitals. Moreover, to practice holistic medicine, the treating physician should also understand the social, cultural and economic conditions of the family. Family physicians need to make the optimal use of the resources and judiciously select the investigations for diagnosis.

MD in Family Medicine

Family Medicine is defined as that specialty of medicine which is concerned with providing comprehensive care to individuals and families and integrating biomedical, behavioral and social sciences. As an academic discipline, it includes comprehensive health care services, education and research. A family doctor provides primary and continuing care to the entire family within the communities; addresses physical, psychological and social problems; and coordinates comprehensive health care services with other specialists, as needed. The practitioners in family medicine can play an important role in providing healthcare services to the suffering humanity. The General practitioner's responsibility in Medicare includes management of emergencies, treatment of problems relating to various medical and surgical specialties, care of entire family in its environment, appropriate referrals and follow up. He is the first level contact for the patients and his family. In a country with large population spread over to rural sector, the need for adequately trained, properly qualified, competent general practitioners is acutely felt

2.5 Duration

Every candidate seeking admission to the training programme to qualify for the Degree of MD/MS in the subjects conducted under the University shall pursue a regular course of study, in the concerned Department under the guidance of a recognized Post Graduate teacher for a period of three years.

2.6 Syllabus

Present in clause 2.10 of the curriculum.

The concept of Health Care counselling shall be incorporated in the relevent areas.

2.7 Total number of hours

Present in clause 2.10 of the curriculum.

2.8 Branches if any with definition

Present in clause 2.10 of the curriculum.

2.9 Teaching learning methods

- The training given with due care to the Post Graduate students in the recognized Institutions for the award of various Post Graduate medical Degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational programme during the period of stay in the Institution.
- All candidates joining the Post Graduate training programme shall work as full time residents during the period of training, attending not less than 80 percent of the training, and given full time responsibility, assignments and participation in all facets of the educational process.
- Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.
- The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India (M. C. I.) inspectors to assess the same at the time of inspection.

- Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently similar to the model prescribed by the University. This log book will be assessed by the postgraduate Guide of the student and will be jointly evaluated by the Guide & Head of the Department.

- The record books shall be checked and assessed by the faculty members imparting the training, monthly.
- During the training for Degree to be awarded in clinical disciplines, there shall be proper training in basic medical sciences, in applied aspects of the subject and in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities.
- The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

Seminars & Journal Review Meeting

The postgraduate students should actively participate in departmental seminars and journal reviews. A record showing the involvement of the student in the form of a diary shall be maintained. Seminars & Journal review meeting may be conducted alternately once in every 15 days.

Maintenance of Record of Work done.

1. A diary showing each days work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of each month.

2. A practical record of the work has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.

3. A list of the Seminars and Journal clubs attended and participated by the student has to be maintained. This should be scrutinized by the head of the department.

Dissertation work

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and KUHS regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.
2. Data collection for dissertation and writing the dissertation.
3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.
4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the university from time to time.

Registration of dissertation topic:

Every candidate shall submit a synopsis in the prescribed proforma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to the University within the first 6 months from the commencement of the course or as notified by the university in the calendar of events.

Submission of dissertation

The dissertation shall be submitted to the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appear for the University examination.

PROCEDURAL SKILLS

The students are expected to acquire following skills :

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- Anaesthesiology : endotracheal intubation; intravenous access (peripheral and central lines, venesection, intravenous infusion); anaesthesia (local, regional, intravenous sedation).
- Medicine : cardio-pulmonary resuscitation (CPR) and advanced cardiac, trauma, obstetric life supports, lumbar puncture, pleural aspiration, peritoneal aspiration, drainage of tension pneumothorax; nasogastric intubation and lavage; intravenous, intramuscular, intradermal and intralesional injections; intra-articular injection and aspiration; take an ECG.
- Obstetrics & Gynaecology : conduction of normal delivery, making and suturing of episiotomy, management of breech delivery and retained placenta; repair of perineal laceration; vacuum extraction, forceps extraction; speculum examination, cervical smear, IUCD insertion.
- Ophthalmology : funduscopy, removal of foreign bodies.
- Orthopaedics : splinting of fractures, reduction of simple fractures and dislocation; application of casts.
- Otolaryngorhinology : removal of foreign bodies from nose, syringing of ear, nasal packing; use of otoscope.
- Paediatrics : resuscitation of the newborn; intraosseous infusions.
- Pathology : haemoglobin level, erythrocyte sedimentation rate, total and differential leukocyte count, blood picture, routine and microscopic examination of urine and stool; taking swabs from various orifices and wounds; Fine Needles Aspiration; performing Gram stain and Ziehl-Neelsen stain; microscopy of urethral and vaginal discharge; blood sugar with glucometer; use of uristix etc.
- Surgery : Assessment and closure of traumatic wounds; burns; incision and drainage of abscess; in-growing toe-nails; excision and biopsy of superficial swellings; venesection; urethral catheterization; suprapubic cystostomy; circumcision in adults; intercostals tube drainage; tracheostomy; screening for breast cancer.
- **Teaching and Training activities**

a) Discussions : The main teaching/learning activity will be discussions. These will be focussed on clinical situations arising in the family practice and will cover the specific topics as well as subjects of topical interest.

b) Case presentations : The candidates will be required to present to the Programmed Director/Preceptor, cases of clinical interest for discussion. The record of such cases will be maintained in the logbook.

c) Family profiles : The candidates will be required to study the family profiles under the charge of programme director and will be required to maintain records at least of the two families in the logbook.

d) Case histories : The candidates will be required to record eight case histories (two each of medicine, paediatrics, surgery, obstetrics and gynaecology).

e) Medical and Surgical Procedures : A candidates will maintain a record of the procedures performed, assisted or observed in the logbook.

f) Emergency/Domiciliary visits : A record of emergencies attended and domiciliary visits made be maintained.

2.10 Content of each subject in each year

Clinical areas

24 months of rotating residencies in approved hospital wards in the areas of :

Internal Medicine including mental health : 10 months

- Paediatrics : 4 months
- General Surgery including orthopedics : 3 months
- Obstetrics and Gynecology : 2 months
- Emergency services : 1 month and
- Elective training includes any one or more from the areas of dermatology, ophthalmology, otorhynolaryngology, geriatrics, physical medicine, rehabilitation and

anesthesia. Other relatively lesser known areas for elective training include school health, sports medicine, long term care and occupational/industrial medicine.

Field areas

12 months of rotating field postings in a primary health centre or a rural/urban health clinic

The details of the topics to be covered during the period are as follows:

INTERNAL MEDICINE

Diagnosis & management of common diseases; management of common emergencies seen in General Practice cardio-vascular, respiratory, gastrointestinal, neurological, metabolic and others like snake bite and heat stroke etc.; nutritional advice & management of undernutrition and Obesity; basic knowledge of adolescent health needs, common genetic diseases, immunology and autoimmune diseases, hormonal disorders psychosomatic illness tropical diseases and common infections.

GERIATIRICS

Medical examination of the aged; common diseases in the old age & their management eg. vascular, musculosketetal, oncological, psychological, neurological and accidental; management of terminally ill patients and problems of the family after death; care of elderly, social & psychological problems in elderly.

PSYCHIATRY

Knowledge of the principles and experience in the practice of interviewing and counseling patients and their families; basic principles of psychotherapy; rational use of psychotherapeutic medication; management of alcoholism and other substance abuse; common psychiatric problems and their management.

DERMATOLOGY & S.T.D.

Prevention diagnosis and management of common dermatological conditions; principles of dermatological therapy; principles of rehabilitation of chronic dermatological patients and

domiciliary care; minor surgical procedures in dermatology including electro-surgery, skin-biopsy; principle of diagnosis and management of sexually transmitted diseases, HIV/AIDS.

SURGERY

The recognition and evaluation of conditions requiring surgical procedures; management and appropriate referral of primary surgical emergencies e.g. burns, shock, etc.: acute abdomen; management of minor of trauma injuries including immediate and resuscitative treatment of acute injuries: accidents; management of electrolyte and fluid requirements; health education for prevention of injuries; diagnosis and management injuries, sprains, fractures and dislocations with proper referral; recognition, diagnosis and management of common diseases including emergencies of ENT; removal of foreign bodies from nose, ear.

OPHTHALMOLOGY

Recognition of common eye diseases defects and management and referral of all emergencies in eye diseases including eye injuries; refractive errors; national programme for prevention of blindness, indications, contraindications and advantages of contact lens and Intra Ocular Lenses (IOL); minor surgical procedures in ophthalmology.

OBSTETRICS & GYNAECOLOGY

Antenatal care and intranatal care; management of common problems during pregnancy and common problems in gynaecology; genital tract malignancies; immediate therapy in obstetrical emergencies

ANAESTHESIOLOGY

Basic principles of anaesthesiology; basic knowledge about specific techniques eg. endotracheal incubation, local anaesthesia, intravenous, anaesthesia, relaxants in anaesthesia, techniques in management of common anaesthesia, accidents including cardiac arrest spinal anaesthesia, epidural anaesthesia; cardiopulmonary resuscitation etc.

DIAGNOSTIC MEDICINE

CLINICAL LABORATORY: Basic laboratory investigations; Familiarization with clinical laboratory equipments, common reagents, tests, interpretation of common laboratory investigations.

IMAGING TECHNIQUES: Basic radiological procedures; ability to read a normal ski grams; radiation hazards and their precautions; basic idea about least imaging techniques and their indications including ultrasound.

ELECTRONIC TRACING: ECG, recording, knowledge of normal and abnormal ECG; (TMT) Tread Mill Test – indications and outline of technique; EEG – Electroencephalogram its indication outline of technique.

THERAPEUTICS

Knowledge about national pharmacopoeia, drug acts, drug & pharmaceutical agents, their indications contraindications, dosage, adverse reactions and their management; awareness of essential and rational drug use.

TOXICOLOGY – Common poisons, their sources properties, symptoms they produce, lethal doses, and remedial measures to combat the effects e.g. Alcohol, Kerosene, barbiturates, corrosives, insecticides cannabis, ether and organic phosphorus.

COMMUNITY MEDICINE

Behavioural sciences – sociology, psychology; general epidemiological – levels of prevention; health services at centre, state and district levels; national health programmes and policies; demography and family planning; principles of environmental sanitation; health statistic and demography – record keeping statistics tabulation and analysis of morbidity and mortality data; health education – principle of health education and methods; health planning and five year plans; national health insurance schemes and other private schemes; school health programmes; management of epidemics and national disasters; epidemiological, prevention and control of common communicable and other diseases eg. malaria, filarial, cholera, gastrointestinal diseases, leprosy, tuberculosis, STD, AIDS; control of malnutrition; blindness; psychosomatic illness; role of NGOs; research in community medicine and interaction with other fields of medicine

GENERAL PRACTICE

Basic concepts and principles of medical practice to help; financial aspects of practice; medical practice in India, its patterns, comparative medical services, staff management record keeping, stock keeping, account keeping and taxation and equipments including furniture; manpower and staff management in general practice; role of computers in general practice

MEDICAL JURISPRUDENCE

Health legislation relating to public health and health programmes including municipal acts in relation to health and mental health; Indian Medical Council Act.; ESI and Factories Act, other legislation; law and private practitioners

PROFESSIONAL DUTIES AND ETHICS

Obligation and responsibilities in medical practice; knowledge of relevant laws of the country governing the practice of medicine; knowledge of medical ethics and principles of good practice; doctor-patient relationship, doctor-doctor relations, relationship with medical organisation and hospitals, para-medical services, including pharmacists and druggists.

MEDICOLEGAL PROBLEMS AND RESPONSIBILITIES

Knowledge of health legislation and duties of doctor attending to cases, certification court evidence, expert advice; medical negligence and Consumer Protection Act.

SKILLS PROFICIENCY – Minimum of these activities should be done by each student

1- MEDICAL

L.P	5
Venepuncture	5
C.R.P.	5
Gastric levage, enema, catheterization	10
Thoracocentesis	5
Use of defibrillator	5
Ascitic fluid aspiration	5

2- **SKIN**

Skin biopsy and skin smear	5
Electocauterisate of warts	5

3- **OBSTETRICS & GYNAECOLOGY**

Use of gavidogram; instrumental evacuation for incomplete abortion; conduct normal labour	5
Using parictogram and management of atonic PPH	10

4- OPHTHALMOLOGY

Refractive error assessment	5
Tonometry	5
Fundoscopy	10
Removal of foreign body	3
Eye syringing	2

5- **SURGERY**

Fine needle aspiration; cytology (FNAC);	2
Proctoscopy	2
Paracentesis	2
Incision & drainage	5
Suturing	5
Dressing/Bandage	10
Tracheosomy	3
Intravenous infusion	15
Circumcision	5
Reduction of paraphimosis	3
Anal & urethral dialatation	5
Water seal drainage	5
Vasectomy	10
Cut open	15

6- ENT

Audiometry	5
Auroscopy	5
Rhinoscopy	5
Laryngoscopy	5
Removal of wax and foreign body removal for ear & nose	5
Nasal packing	5
Ear syringing	5
Hearing tests	5
Ear piercing	5

7- ORTHOPEDICS AND TRAUMATOLOGY

transportation of patients with trauma application of POP	10
removal of POP	10
Splints	10
Tractions	3
reduction of fracture & dislocation, intra-articular injection	5

2.11 No: of hours per subject

Present in clause 2.10 of the curriculum.

2.12 Practical training given

Present in clause 2.10 of the curriculum.

2.13 Records

As per clause 2.21.

2.14 Dissertation: As per dissertation regulations of KUHS

RESEARCH

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher as a guide. All Post Graduate students should submit the title and synopsis of thesis duly attested by the competent authorities in the prescribed proforma along with the required fees within six months after the date of admission.

The 480 hours available should be fruitfully utilized by the student for attending conferences / CME programmes and for thesis writing and case study. Apart from this they can utilize these hours for creating basic awareness of emergency medicine among the other specialties and common masses.

Five copies of the thesis duly certified, shall be submitted by the candidate to the University 6 months before commencement of his/her final Examination for onward transmission to the experts for evaluation.

The thesis submitted shall be examined by three experts; one Internal and two External experts, who shall not be the examiners for the Theory and Clinical. Only on the acceptance of the thesis by two experts, the candidate shall be permitted to appear for the examination. On evaluation, if two experts are of the opinion that the thesis needs modification it has to be resubmitted with modifications within 45 days along with prescribed fees and it will be reevaluated by the University. If thesis is rejected by 2 experts, the candidate will loose one chance of appearing for the examination and has to resubmit a fresh thesis for further evaluation i.e. the candidates are not allowed to appear for the examination with their parent batch.

The 480 hours available should be fruitfully utilized by the student for attending conferences / CME programmes and for thesis writing and case study. Apart from this they can utilize these hours for creating basic awareness of emergency medicine among the other specialties and common masses.

Subjects like Tropical Medicine, Community Health may also be chosen while preparing thesis.

GUIDELINES FOR SUBMISSION OF THESIS BY CANDIDATES OFFERING BY CANDIDATES OF DIPLOMATE NB.

Preamble

Research shall form an integral part of the education programme of all candidates registered for Diplomat of NB degrees of the Board. The basic aim of requiring the candidates to write a thesis is to familarise him/her with research methodology. The members of the faculty guiding the thesis for the candidate shall ensure that the subject matter selected for the thesis is **feasible, economical** and **original**.

Guidelines

The thesis may be normally restricted to the size to 100 pages. To achieve this, following points may be kept in view.

1. Only contemporary and relevant literature may be reviewed.
2. The techniques may not be described in detail unless any modification/innovations of the standard techniques are used and reference may be given.
3. Illustrative material may be restricted.
4. Since most of the difficulties faced by the residents relate to the work in clinical subject or clinically oriented laboratory subjects the following steps are suggested:
    a. For prospective studies, as far as possible, the number of cases should be such that adequate material, rudged from the hospital attendance, will be available and the candidate will be able to complete the date collection within a period of 6-12 months, so that she/he is in a position to complete the work within the stipulated time.
    b. The objectives of the study should be limited and well defined.
    c. As far as possible, only clinical or laboratory data of investigations or patients or such other material easily accessible in the existing facilities should be used for the study.

d. The laboratory work required to be performed by the residents of clinical departments should be minimal. For this purpose technical assistance, wherever necessary, may be provided by the department concerned. The resident of one specialty taking up some problem related to some other specialty should have some basic knowledge about the subject and he/she should be able to perform the investigations independently, wherever some specialised laboratory investigations are required a co-guide may be co-opted from the concerned investigative department, the quantum of laboratory work to be carried out by the candidate should be decided by the guide and co-guide by mutual consultation.

e. The Clinical residents may not ordinarily be expected to undertake experimental work or clinical work involving new techniques, not hitherto perfected or the use of chemicals or radio isotopes not readily available. They should however, be free to enlarge the scope of their studies or undertake experimental work on their own initiative but all such studies may be feasible within the existing facilities.

f. The residents should be able to use freely the surgical pathology/autopsy data if it is restricted to diagnosis only, if however, detailed historic data are required the resident will have to study the cases himself with the help of the guide/co-guide. The same will apply in case of clinical data.

5. Statistical method used for analysis will be described in detail.

Rules for Submission of Thesis by candidates

(i) The protocol of Thesis should be submitted to the office of the University through head of the institutions within 6 months of joining the training in Medical College.

(ii) The guide will be a recognized PG specialist in the institution.

(iii) The thesis is to be submitted 6 MONTHS before the commencement of the MD examination.

Guidelines for Writing of Thesis

Title - Should be brief, clear and focus on the relevance of the topic.

Introduction – Should state the purpose of study, mention lacunae in current knowledge and enunciate the Hypothesis, if any.

Review of Literature – Should be relevant, complete and current to date.

Material and Methods- Should include the type of study (prospective, retrospective, controlled, double blind etc.) details of material and experimental design procedure used for data collection and statistical methods employed; statement of limitations ethical issues involved.

Observations– Should be organized in readily identifiable sections having correct analysis of data, and presented in appropriate charts, tables, graphs and

diagram etc. There should be statistically interpreted

Discussion -Observations of the study should be discussed and compared with observations of other research studies. The discussion should high light on bold original finders and should also include suggestion for future.

Summary and Conclusion

Bibliography - Should be correctly arranged in Vancouver pattern.

Appendix—All tools used for data collection such as questionnaire, interview schedules, observation check lists etc should be put in the annexure.

2.15 Speciality training if any

Present in clause 2.10 of the curriculum.

2.16 Project work to be done if any

As per direction of the Head of the Department.

2.17 Any other requirements [CME, Paper Publishing etc.]

A postgraduate student of a postgraduate degree course in broad specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

This information will be certified by the concerned HOD/Head of the Institution while the candidate applies for the University examination.

2.18 Prescribed/recommended textbooks for each subject

- Text book of Family Medicine – Robert. E. Rakel, David. P. Rakel.
- John Murtagh's general practice.
- Practice tips – John Murtagh.

- Oxford hand book of general practice.
- Textbook of Family Medicine. Ian. R. Mc Whinney, Thomas Freeman.

2.19 Reference books

A. SWANSON'S FAMILY MEDICINE REVIEW
   ALFRED TALLIA
B. CONN'S CURRENT THERAPY 2016, EDWARD BOPE
C. FAMILY PRACTICE GUIDELINES, THIRD EDITION BY JILL C. CASH MSN APN FNPB
D. CASE FILES FAMILY MEDICINE, FOURTH EDITION, BY EUGENE TOY
E. CURRENT PRACTICE GUIDELINES IN PRIMARY CARE, BY JOSEPH S. ESHERICK

2.20 Journals

- Annals of Family Medicine.
- British journal of General Practice. Publisher- RCGP
- American Family Physician. Publisher AAFP
- Australian prescriber
- British Medical Journal
- Journal of Indian Medical Association.
- Journal of Family Medicine and primary care. Published by AFPI.
- Journal of Association of Physicians of India
- The journal of post graduate medicine.
- Indian Paediatrics.

2.21 Logbook

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/ operations assisted / performed by him / her during the training period right from the point of entry and its authenticity shall be assessed monthly by the concerned Post

Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, & procedures & tests performed & seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. The guidelines for preparing the logbook will be available in the Kerala University Health Sciences website (www.kuhs.ac.in). Logbooks may be prepared by the Institutions and departments. Log book will be evaluated during PG examination and 20 marks will be allotted (out of 100 marks of viva).

The purpose of the log book is to :

- Help to maintain a record of the work done during the training.
- Enable the programme director to have first hand information about the work done and to intervene whenever necessary
- Use it to assess clinical and surgical experience gained periodically.
- The entries in the log book should be maintained on a daily basis.
- During the viva, the candidate may be asked questions based on the cases of procedures entered in the log book

The log book should be clear, explicit record of the work carried out by the candidate and should be a true reflection of the training received by the candidate. Considerable importance will be given to the quality of the log book in the final assessment of the candidate.

RECORD OF ACADEMIC ACTIVITIES – LOG BOOK

The log book should show evidence that the above subjects were covered (with dates and the name of teacher(s)

The candidate will maintain the record of all academic activities undertaken by him/her in log book.

- Personal profile of the candidate
- Educational qualification/Professional data
- Record of case histories (Fifteen cases) studied by him/her. (Model should be given in the log book) Three case histories pertaining to predominantly Medical problems, three predominantly Surgical, two Paediatrics, while the rest seven may pertain to other discipline like Obstetrics and Gynaecology, Ophthalmology, ENT, Dermatology, Psychiatric etc.
- Record of Family Profiles – Candidates will maintain the profiles of at least five families in which at least one member of the family has health problem, eliciting its impact on the family and the role of family taking into account their social cultural and the economic consideration.
- Procedures learnt – The candidates are expected to learn Medical and Surgical procedures during their advance training in Family Medicine. The record should depict medical and surgical procedures observed, assisted and performed during the period of training.
- Record of case Demonstration/Presentations
- Record of participation in EME activities – Direct contact activities (lectures, seminars, workshops conference); Indirect contact activities (correspondence journals, books, audio video tapes)

3. EXAMINATION

3.1 Eligibility to appear for exams [including Supplementary

- A minimum of 80% attendance during each year of the course separately.
- Successful Submission of completed Logbook.
- Submission of Dissertation and its approval by the University.
- Should have presented at least one paper/poster in International/National/State conferences.

Besides, he/she must have attended at least two State/National conferences during his/her training period. **(This is considered as eligibility criteria for appearing for the examination)**

The examinations shall be organized on the basis of marking system to evaluate and certify candidate's level of knowledge, skill and competence at the end of the training. The examination for M.S. /M.D. shall be held at the end of third academic year.

3.2 Schedule of Regular/Supplementary exams

The University shall conduct not more than two examinations in a year.

3.3 Scheme of examination showing maximum marks and minimum marks

- ***Theory***

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances with regard to that speciality.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated by a system of evaluation by all examiners (Internal/External) preferably before the start of the Clinical/Practical and Oral examination. Average of the marks for each paper will be taken after multiple valuation.

- *Clinical / Practical and Oral*

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Number of candidates

The maximum number of candidates to be examined in Clinical / Practical and Viva voce on any day shall not exceed six for M.D. /M.S. Degree.

Theory 400 marks

Sl. No.	Subject	Theory		Theory Group		Practical				Practical Group		Total	
		University				University		Viva					
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	100	40	400	200	300		100		400	200	800	400
2	Paper II	100	40										
3	Paper III	100	40										
4	Paper IV	100	40										

3.4 Papers in each year

Not applicable.

3.5 Details of theory exams

Duration – 3 hours each paper

Theory examination: Consists of four papers, each paper consisting of one structured long essay for 20 marks, and eight short essays carrying ten marks each.

PAPER I	**Applied Basic Sciences and comprehensive community health care and knowledge of normal development of health and disease.**
PAPER II	Medical and Allied Sciences including Cardiology, Gastroenterology, Geriatrics, Dermatology, Psychiatry, Neurology and Nephrology, Radiology and other diagnostic procedures.
PAPER III	Surgery and Allied Sciences including ENT, Ophthalmology, Orthopaedics and Anaesthesia
PAPER IV	Maternal and Child Health including their community Health Care Management.

3.6 Model question paper for each subject with question paper pattern

QP Code: Reg.No.:……..

MD Degree Examinations in Family Medicine

(Model Question Paper)

Paper I – Basic Science as Applied to Family Medicine

Time: 3 hrs Max marks: 100

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essay: (20)

1. A 54 years old male, alcoholic since the past 24 years, presented with anorexia, nausea, vomiting and progressive abdominal distension. His liver function test shows the following findings. Total bilirubin – 1.8 mg%, direct bilirubin – 0.8 mg%, SGOT- 180 IU/L, SGPT- 120 IU/L, ALP- 80 IU/L, Albumin- 2.9 gm/dl, Total protein- 5.9 gm/dl. Answer the following :

- What is the most probable diagnosis of this case with reasoning.
- What are the gross and histopathological changes in the liver in this patient
- Discuss the neurological manifestations of chronic alcohol abuse.
- Outline the management of this patient. (2+5+5+8)

Short essays: (8x10=80)

2. Oral glucose tolerance test.
3. Beta- blockers.
4. Growth charts.
5. Hypovolaemic shock
6. Autoclaves
7. Physiology of menstruation
8. Anaphylaxis
9. Broncho pulmonary segments.

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QP Code: Reg.No.:…….....

MD Degree Examinations in Family Medicine

(Model Question Paper)

Paper II – General Medicine, Psychiatry, Pulmonary Medicine, Dermatology, Geriatrics, Pain and palliative care, emergency care, Radiology.

Time: 3 hrs Max marks: 100

- ***Answer all questions***
- ***Draw diagrams wherever necessary***

Essay: (20)

1. A 32 years old male, an office worker, BMI-29, came to the OP with a report FBS-212mg%, PPBS-280mg%.His BP was recorded as 136/86mm of HG. He was diagnosed to have diabetes 2 months back and is on diet control. Family H/O diabetes present. Answer the following:

   • Discuss the initial work up and management strategies in this patient.

   • Outline the monitoring and follow up of this patient.

   • Discuss the pathogenesis of diabetic foot and patient education to prevent diabetic foot. (8+6+6)

Short essays: (8x10=80)

2. Acute pulmonary oedema.

3. Irritable bowel syndrome.

4. Falls in elderly.

5. Acne vulgaris.

6. Bronchial asthma management.

7. Magnetic resonance imaging.

8. Depression.

9. Pain management in terminal case of malignancy.

****

QP Code: Reg.No.:……..

MD Degree Examinations in Family Medicine

(Model Question Paper)

Paper III – General surgery, Orthopedics, Ophthalmology, ENT, Anesthesia

Time: 3 hrs Max marks: 100

• ***Answer all questions***

• ***Draw diagrams wherever necessary***

Essay: (20)

1. 47 years old unmarried woman presented with C/O swelling in her right breast which she noticed 3 weeks back. On examination she was found to have a lump measuring 5x4 cms, hard in consistency, in the upper, outer quadrant of her right breast. Nipple retraction and peau d'orange noted in the right breast. Two axillary lymph nodes, measuring 1x1 cm, central group, palpated in the right axilla. Answer the following:

   - What is the most probable diagnosis in this case
   - How will you investigate this patient
   - What is stage of this disease
   - How will you manage this case
   - Discuss fibrocystic disease of the breast. (1+5+2+8+4)

Short essays: (8x10=80)

2. Epidural anaesthesia.
3. Carpel tunnel syndrome.
4. Principles of splints in fractures.
5. Conjunctivitis.
6. Epistaxis
7. Fissure in ano
8. Hematuria
9. Cervical lymphadenopathy.

****

QP Code: Reg.No.:…….....

MD Degree Examinations in Family Medicine

(Model Question Paper)

Paper IV – Community Medicine, Obstetrics and Gynecology, Pediatrics, Recent advances.

Time: 3 hrs Max marks: 100

• ***Answer all questions***

• ***Draw diagrams wherever necessary***

Essay: (20)

1. Three patients with fever and yellowish discoloration of sclera came to a PHC outpatient clinic during the first week of April. Eight more similar cases came to the clinic during the second week of April. We are suspecting an outbreak of hepatitis A and as medical officer of the PHC; you have decided to conduct an outbreak investigation. Answer the following:

- List the steps of investigation of an epidemic.
- Define epidemic.
- Describe the process of verification of diagnosis in this outbreak.
- Suggest measures to halt the spread of epidemic at the individual and community level.
- Role of vaccination to prevent hepatitis A (5+2+3+7+3)

Short essays: (8x10=80)

2. Emergency contraception.

3. Ante natal care.

4. Febrile seizures in children.

5. Breast feeding.

6. Evidence based prevention.

7. Role of vaccines in prevention of cancer cervix.

8. Case control studies.

9. Adolescent friendly health services.

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3.7 Internal assessment component

Not applicable.

☆

3.8 Details of practical/clinical practicum exams

- ***Clinical / Practical and Oral***

(i) Clinical/Practical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a Specialist/Teacher, for which candidates shall examine minimum one long case and of two short cases or as the case may be in each speciality. In the case of Non Clinical / Para clinical subjects where there are no clinical cases, appropriate changes can be made in the practical examination to evaluate the skill and knowledge of the candidate.

(ii) The clinical / practical examinations shall also assess the candidate's knowledge of Basic Medical Sciences as are relevant to his subject. Case selection for examination should be comprehensive and include all the different systems.

(iii) The Oral examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty.

Clinical / Practical 300 marks

i. 1 long case – (medicine) - 45 mts - 100 marks

ii. 5 short cases – (one from paediatrics, surgery, OBG each, one patient counselling station and 5th case from Dermatology, ENT, Orthopaedics/Ophthalmology) 40x5 = 200 marks.

3.9 Number of examiners (Internal & External) and their qualifications

Examiners

- All the Post Graduate Examiners shall be Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned as per M. C. I. Rules i.e. he/she should hold recognised Post Graduate degree in the concerned speciality and have teaching experience of not less than 8 years as Lecturer/Assistant Professor, out of which he/she should have minimum 5 years teaching experience after obtaining Post Graduate Degree. External examiners should have minimum 3 years experience as a postgraduate examiner in the concerned subject.

- For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners from outside the State. One of the Internal examiners shall be a Professor or Head of the Department.

3.10 Details of viva

Viva-voce: Instruments, ECG, X-ray, Biochemistry X ray and CT reading Drugs used in Emergency department Ventillator setting Skill station for breathing problems – Pneumothorax, Haemothorax Skill station for circulation problems – shock cardiac tamponade.	4 stations x 20=80 marks

Log Book – 20 marks

Total – 100 marks

4. INTERNSHIP

Not applicable for P.G. Medical degree courses.

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc. to be formulated by the curriculum