M.D. ANAESTHESIA - SYLLABUS

May - 2006

At the end of three years of training as residents in anaesthesia, the candidates should be fully conversant with theory and practical aspects of:

A. **Human Anatomy and Physiology of** various organ systems and cellular components in relation to Anaesthesia including muscles, neuromuscular junction, nerve plexuses, cardiovascular, respiratory, neurological, hepatobiliary, renal, endocrine and temperature homeostasis, theories of mechanism of production of anaesthesia, changes during pregnancy, various tests/investigations to evaluate the functional status of organ systems as applied to Anaesthesia Management, Intensive Care Practice and Pain Relief

B. **Pharmacology** as applied to Anaesthesia, Intensive Care Practice and Pain Relief including General Pharmacological Principles, Pharmacokinetics and Pharmacodynamics of Anaesthetic Drugs (including Uptake and Distribution of Inhaled Anaesthesia agents and All the Adjuncts used in Anaesthesia, Drugs used for treatment of various Diseases and Drug Interaction

C. **Pathophysiology of various diseases** including disorders of cardiovascular, respiratory, neurological, hepatobiliary, renal, endocrine and immune systems, various tests/investigations to grade/measure the disease process of various organ systems as applied to anaesthesia management, intensive care practice and pain relief

D. **Medicine** as applied to the practice of Anaesthesia including diagnosis and management of Diabetes, Hypertension, Bronchial Asthma, Chronic Obstructive Pulmonary Diseases, Respiratory Failure, ARDS, Myocardial Ischemia / Infarction, Arrhythmia, Shock, Congestive Heart Failure, Acute / Chronic Renal Failure, Head Injury, Unconscious patients, Status Epilepticus / Asthmaticus, Endocrine Disorders, Diseases related to Dysfunction of Hepatobiliary, Muscular, Connective Tissues and Immune system, Management of Perioperative Infection, Neuromuscular Disorders, Poisoning etc. and interpretation of ECG / Blood Gases / Other Biochemical Values and Function Tests

E. **Physics** as applied to Anaesthetic gases, vapours, anaesthesia machine, breathing systems, monitors, ventilators, therapeutic devises & other relevant equipment including physical principles involved in their construction and functioning

F. **Perioperative Anaesthesia management** including pre-operative evaluation, intra-operative management as well as post-operative care, monitoring (invasive as well as non-invasive) as applied to various surgical specialities and age groups.

G. **Theory and practice of various techniques / aspects of Routine & Emergency cases** of **General Anaesthesia** (e.g., Intravenous / Inhalational, Endotracheal / Mask / LMA / COPA, Spontaneous/Controlled mode of ventilation, induced hypotension / hypothermia etc.), **Regional Blocks** (Spinal, Epidural & Peripheral Nerve block) and **Local Anaesthesia,** including **various postures** required for anaesthetic/surgical procedures, their effects **and Recent Advances** for most minor to supra major surgeries in the field of:

- **General surgery:** e.g. minor cases like haemorrhoidectomy to supra major cases like Liver transplant
- **Gynaecology and Obstetrics**
- **ENT and Head & Neck**
- **Orthopaedics**
- **Ophthalmology**
- **Pediatric & Neonate**: Differences between adult and pediatric Anatomy, Physiology, Pharmacology, Anaesthesia principles, pediatric/neonatal emergencies, postoperative care, fluid & ventilator management etc

- **Cardiac, Vascular & Thoracic:** Conduct of closed heart as well as open heart surgeries (Valvular, Ischemic, Congenital -Cyanotic & Acyanotic), CABG (including off pump), Pulmonary Cases (Insertion of Double Lumen Tube, one lung anaesthesia), Thymus and Vascular surgeries etc. Ability to go on Cardiopulmonary bypass and disconnect from bypass, Ability to take, manage and interpret Arterial, Central Venous and P.A. Lines, postoperative care, management of re-explorations etc.
- **Neurosurgery**: Ability to monitor ICP, Management of head injuries, bleeds, tumours, etc with raised ICT. Ability to safely manage cases in sitting, prone, lateral, jack-knife positions and Anaesthetic management for neuro-radiology procedures
- **Urology**: Management of endoscopic surgeries like TURP/TURBT etc, Problems related to TURP, extracorporeal shock wave lithotripsy, percutaneous placement of nephrostomy etc., anaesthetic management of patients with acute and chronic renal failure, anaesthetic management of renal transplant cases of donor as well as recipient.
- **Plastic**: Management of burns contractures, congenital faciomaxillary abnormalities like cleft lip and palate, faciomaxillary injuries like fracture mandible, maxilla, zygoma, panfacial fractures, difficult intubations, microvascular surgeries, reconstructive surgeries, aesthetic surgeries etc
- **Dental**: Monitored Anaesthesia Care, Anaesthetic management of pedodontia patients, maxillo-facial surgeries including TMJ Ankylosis, Awake, Retrograde & Fibreoptic intubations
- **Endoscopies / laparoscopies**: Anaesthetic management, specific requirement and complications of various endoscopies like cystoscopy, ureteroscopy, PCNL, hysteroscopy, thoracoscopy, mediastinoscopy etc. and Lap. assisted/laparoscopic surgery like hysterectomy, tube ligation, appendicectomy, cholecystectomy etc.
- Anaesthesia for various **diagnostic, therapeutic and Specialized** procedures
- Anaesthesia for **Geriatric patients**
- Anaesthesia for surgery using **LASER**
- **Anaesthesia / Sedation techniques out side operating room:** Electroconvulsive shock therapy (ECT), Electrophysiologic tests, Radiofrequency ablation, Cardioversion, Cardiac catheterization, Special anaesthetic considerations in radiology and interventional radiology related to Dye allergies, Embolization, Monitoring / Equipment options in the MRI suite

H. History of **Anaesthesia**

I. Airway Management: Assessment of difficult airway, Awake, Retrograde, Use of intubating LMA's, Intubating Stylets, Various laryngoscopes designated for difficult airway, Insertion of Combitube, Ability to perform Cricothyrotomy and use of Venturi, Minitrach & Fibreoptic intubations etc

J. Basic & Advanced Cardiopulmonary & Cerebral Resuscitation (**CPCR**) for all age group of patients under different situations e.g., neonates, pregnant females, poisoning cases, trauma victims etc.

K. Acid base & Fluid management including use of Crystalloids, Colloids, blood & blood products

L. Arterial, Central Venous and P.A. Lines: Establishment, management and interpretation

M. Anaesthetic drugs used in **perioperative care**

N. Equipments (Minor to advanced monitoring) – their use, maintenance, sterilisation and care

O. Medical gases: Knowledge of Manufacturing, Storage and Central pipeline Systems

P. Day Care / Outpatient Anaesthesia.

Q. Remote Location Anaesthesia: Anaesthetic practice during **disasters** and for large turnover surgeries in **camps / mass casualties**.

R. **Emergency** Anaesthesia
S. **Monitored Anaesthesia** Care
T. **Labour Analgesia**
U. **Pain relief –** Acute & Chronic
V. **Critical care practice** including oxygen therapy, respiratory therapy, ventilatory support, haemodynamic monitoring, prevention and management of multi organ failure, and care of patients with brain damage or brain dead patients For organ Transplant
W. **Advanced Trauma Life Support (ATLS)**
X. **Occupational Hazards**
Y. **Safety** in Anaesthesia
Z. **Complications of Anaesthetic procedures, its prevention, detection and management**
AA. **Record keeping** in Anaesthesia
BB. **Medical Audit**
CC. **Quality Assurance**
DD. **Anaesthesia standards:** e.g., Minimum monitoring standard
EE. **Medicolegal** aspects in Anaesthesia
FF. **Ethics** in Anaesthesia
GG. **Principles of Evidence Based Medicine**
HH. **Basic Research Methodology and Clinical Trials**
II. **Bio-statistics**
JJ. **Computers:** Utility, computer assisted learning and data storage, Computerised anaesthesia records
KK. **Skills:** for planning of operation theater, pain clinic, recovery room, intensive care etc. including selection and purchase of equipments

TRAINING PROGRAMME

A. ADMINISTRATION OF ANAESTHESIA & PERIOPERATIVE PATIENT CARE

I Year Residents:–

Assisting during minor & major anaesthesia procedures and managing patients in recovery or intensive care areas (all Under Supervision)

The first month of the first year will be spent in orientation in the operating rooms and attending lectures covering the basics of the discipline. After that the first year of training will be spent in learning the fundamentals of anesthesiology with emphasis on checking of anaesthesia equipment including anaesthesia machine, airway equipment and appropriate monitors, preparation of appropriate dosages of various drugs required at specific point of time, mastering clinical skills regarding selection and implementation of an appropriate anesthesia plan, placement of lines, induction of anaesthesia, intubation, maintenance of anaesthesia, and the successful reversal of anesthetic agents. Emphasis will also be placed on learning regional anaesthesia and Cardiopulmonary resuscitation. Also the candidates will be assigned guides for thesis so as to help them prepare protocols.

To start with the first year residents will observe and then slowly become independent in giving general anaesthesia and Regional anaesthesia to patients belonging to ASA grade I & II for minor and major surgery, under graded supervision. They will be posted in rotation to the following specialties during the first year**:** Preoperative assessment area, General Surgery, Gynecology, Obstetrics, Orthopedic, ENT, and Recovery Room. They will be assigned to cases in the Operating Room at the hospitals attached to medical teaching institutes affiliated to the University under which they have registered and will gain experience under the direction and supervision of respective academic faculty.

II Year Residents:–

Assisting during minor & major procedures under anaesthesia, managing patients in recovery or intensive care areas and Independently conducting minor procedures under anaesthesia (GA/RA) for ASA grade I or II patients (excluding expected difficult airway cases and cases with expected major body fluid shift)

The second year of training will be devoted to the subspecialties/superspecialities of anesthesia at the hospitals affiliated to medical teaching institute and the university under the supervision of a faculty member with an aim to concentrate on mastering the knowledge and technical skills associated with providing anesthesia to subspecialty/superspeciality patients. Residents will be rotated in Pediatric anesthesia, Neuroanesthesia, Cardiovascular and Thoracic anesthesia, Ambulatory anesthesia, Obstetrics, Dental Surgery, Ophthalmology, Pain Clinic / Pain Management, Peripheral Theatres, Anaesthesia Outside Operating Rooms, Trauma care, Transplant Surgeries etc. They will be taught to give general anaesthesia and regional anesthesia (Extradural Block - EDB, Spinal Block, and Peripheral Nerve Blocks) to ASA grade I, II, III & IV patients under supervision for superspeciality theaters. They should be able to give GA/RA to other ASA grade I & II patients independently. Rotations in critical care areas e.g., Trauma Ward, Post Anesthesia Care Unit / ICU / Emergency Medical Service will also be part of the second year training curriculum. They should learn pediatric and trauma life support and maintain skills for basic and advanced cardiac life support. The student should be able to analyze and present scientific data and write a thesis.

III Year Residents:–

Assisting during minor & major procedures under anaesthesia, managing patients in recovery or intensive care areas and Independently conducting both minor and major procedures under anaesthesia (GA/RA) for ASA grade I or II patients (excluding expected difficult airway cases and cases with expected major body fluid shift)

The third (final) year of training will be devoted to management of most complex cases available at the institute under the supervision of a faculty member. The residents will be trained to exercise independent judgment, to take responsibility while caring for such patients, and to take part in research projects under the supervision of a faculty member. The student should be able to plan and administer anaesthesia to all patients under graded supervision including patients for Cardiac, Neurosurgery, Pediatric surgery and for all major surgery of subspeciality branches. The aim at the end is to be competent and independent soon after the third year of residency in providing anaesthesia to elective and emergency cases belonging to all specialities. The resident should be able to manage critically ill patients and treat intractable pain. They should also know how to organize mass casualty.

B. THESIS -

- The aim of thesis should be to make the student able to demonstrate capability in research by planning and conducting systematic scientific inquiry & data analysis and deriving conclusion.
- Thesis protocol should be submitted at the end of six months after admission in the course to the Research Committee of the Institute. The protocol must be presented in the department of Anaesthesiology before being forwarded. The research committee appointed by the Dean/Principal to scrutinize in references to its feasibility, statistical validity, ethical aspects, etc would approve the Protocol.
- Protocol in essence should consist of:
  - **a)** Introduction and objectives of the research project.
  - **b)** Brief review of literature.
  - **c)** Suggested materials and methods, and (scheme of work)

d) Statistician should be consulted at the time of selection of groups, number of cases and method of study. He should also be consulted during the study.

e) Bibliography

- Chief guide for thesis will be from the department of Anaesthesiology and co-guide(s), if needed, will be from the department of Anaesthesiology or from other disciplines related to the thesis.
- The thesis shall relate to the candidate's own work on a specific research problem or a series of clinical case studies in accordance with the approved plan.
- The thesis shall be written in English, printed or typed on white A4 size bond paper bearing the matter on one side of paper only and bound with cloth/rexine, with the title, author's name and the name of the College printed on the front cover.
- The thesis shall contain: Introduction, review of literature, material and methods, observations, discussions, conclusion and summary and reference as per index medicus.
- Each candidate shall submit to the Dean four copies of thesis, through their respective Heads of the Departments, not later than six months prior to the date of commencement of theory examination in the subject

C. ACTIVITIES – Participation by way of attendance / presentation in Didactic lectures, Symposia, Seminars, Group discussions, Workshops, Morbidity & Mortality meet, Panel Discussion etc. **Each Student should have actively participated in at least 6 academic sessions per year** during the total training period of three years (total 18).

D. LOG BOOK MAINTENANCE of all the clinical and academic work done by the student in his/her tenure of three years.

Minimum Procedures/Cases required to be done and entered in the log book

Regional Block	
Spinal	= 30 to do
Epidural	= 30 to do
Combined Spinal Epidural	= 20 to do
Caudal	= 10 to do
Bier Block (IVRA)	= 5 to do
Sciatic/Femoral	= 5 + 5 (to observe or do)
Ankle Block	= 5 (to observe or do)
Stellate Ganglion Block	= 3 (to observe or do)
Brachial Plexus	= 5 to observe & 10 to do
Sympathetic Block	= 3 (to observe or do)
Trigger Point injection	= 3 (observe)
Other peripheral N. Block	= 3 to do
Ophthalmic Blocks	= 5 (to observe)
Field Block	= 3 (to observe or to do)
Anaesthesia for:	
General Surgery	= 50 (to do)
Gynecology	= 50 (to do)
Obstetrics	= 20 (to do)
ENT	= 20 (to do)
Orthopedics	= 20 (to do)
Ophthalmology	= 5 (to do)
Plastic Surgery	= 5 (to do)
Endoscopy / Laparoscopy	= 5 (to do)
Urology	= 5 (to do)

Open Heart	= 5 (to observe)
Closed Heart	= 5 (to observe)
Pediatric Surgery	= 5 (to observe)
Craniotomy	= 5 (to observe)
Spinal Surgery	= 5 (to observe)
Joint Replacement	= 5 (to observe)
Anesthesia for organ transplant	= 5 (to observe - desirable)
ECT	= 10 (to do)
Radiology / CT Scan	= 5 (to do) Anaesthesia/sedation
Procedures	
Internal Jugular Cannulation	= 5 + 5 (to observe or do)
External Jugular Cannulation	= 5 to do
Subclavian Vein Cannulation	= 5 + 5 (to observe or do)
Peripheral Central Line	= 15 to do
Arterial Line Cannulation	= 10 to do
Endotracheal Intubation	= 250 to do
LMA insertion	= 30 to do
Difficult Airway Management	= 5 to do
Conduct of Cases	
ASA I	= 300 to do
ASA II	= 200 to do
ASA III	= 50 (to observe)
ASA IV	= 30 (to observe)
Labour Analgesia	= 5 (to observe or do)

ASSESSMENT (*As per Direction No. 01/2008 dtd. 26/05/2008)*

Recommended Reading

I. Books

S.No	Name	Authors / Editors	Year of publication	Last Edition	Publication House
1	Lee's Synopsis of Anaesthesia	G.B.Cashman, N.J.H Davies	2006	13th	Butterworth-Heinemenn
2	Wylie & Churchill Davidson's – A practice of Anaesthesia	Thomas E. Healy Paul R. Knight	2003	7th	Arnold
3	Anaesthesia	Miller Ronald D.	2005	6th	Elsevier Churchill Livingstone
4	Yao and Artusio's Anesthesiology	Fun-Sun F.Yao	2003	5th	Lippincott Williams & Wilkins
5	Anesthesia and Co-existing Disease	R. K. Stoelting S.F. Dierdorf	2002	4th	Churchil Livingstone
6	Anesthesia and Uncommon Disease	Fleisher	2005	5th	Saunders Elsevier
7	Clinical Anaesthesiology	G.E.Morgan M.S.Mikhail	2005	4th	McGraw-Hill
8	Understanding Anaesthesia Equipment	Jerry A. Dorsch Susan E. Dorsch	1998	4th	Williams & Witkins

9	Wards Anaesthesia Equipments	Davey	2005	5th	Baillirro Tindall
10	Anatomy for Anaesthetists	Harold Ellis Stanley Fieldman	2005	8th	Blackwell Science
11	Pharmac. & Physiology in Anaesthetic Practice	R. K Stoelting S.C.Hillier	2006	4th	Lippincott-Raven
12	Shnider and Levinson's Anesthesia for Obstetrics	Hughes Levinsons Rosen	2002	4th	Lippincott Williams & Wilkins
13	Paediatric Anaesthesia	Gregory	2005	4th	Churchil Livingstone
14	Cardiac Anesthesia	Kaplan	2005	4th	W. B. Saunders & Co.
15	Thoracic Anesthesia	Kaplan	2003	3rd	Churchil Livingstone
16	Clinical Application of Mechanical Ventilation	David W. Chang	2001	2nd	Delmar-Thomas Learning

II. "Recent Advances in Anaesthesia and Analgesia" Last two Editions: Mosby Publications

III <u>Journals</u>

1. Indian Journal of Anaesthesia	5. Anaesthesia
2. Journal of Anaesthesiology and Clinical Pharmacology	6. British Journal of Anaesthesia
3. Indian Journal of Critical Care Medicine	7. Anesthesia & Analgesia
4. Anesthesiology Clinics of North America	8. Anesthesiology

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

P.G. CURRICULUM IN THE SUBJECT OF ANATOMY

A. Goal: To prepare the postgraduate student to become an exemplary teacher and a research scientist par excellence. To achieve this goal, the postgraduate student in Anatomy should be given an overall exposure to the subject, teaching methodologies and a sound grounding in research technologies.

B. Learning objectives: To achieve this goal, the following objectives must be fulfilled.

I. Cognitive domain: At the end of three years of postgraduate training the student should be able to

1. Describe the gross anatomy of the human body and correlate the knowledge of structure and function.
2. Describe the microanatomy including cytology of various structures of the human body and compare the knowledge of microstructure with function and interpret it accordingly.
3. Interpret the anatomical basis of symptoms and signs of clinical conditions, diagnostic procedures and treatment modalities.
4. Describe the developmental aspects of human body and interpret the developmental basis of various congenital anomalies.
5. Describe the neuroanatomy in its entirety and interpret the neuroanatomical basis of various clinical conditions.
6. Explain various aspects of genetics and describe genetic basis of disorders and principles of genetics counseling.
7. Explain and interpret radiological anatomy and sectional anatomy of the human body as studied by various imaging techniques.
8. Comprehend surface and living anatomy of the human body.
9. Relate forensic anatomy to the study with medicolegal aspects of bone in particular.
10. Explain the general principles of Anatomy Act and Transplant of Human Organ Act.
11. Explain the process of embalming.
12. Comprehend ethical aspects of biomedical research.
13. Comprehend the basis of disposal of biomedical waste.
14. Comprehend horizontal integration of various subdivisions of anatomy with relevant physiology and biochemistry.

II. Psychomotor domain: At the end of the training, the student should be able to

1 Dissect and demonstrate various parts of adult human body

2. Demonstrate surface landmarks and living anatomy pertaining to mucle power, testing of nerves and palpating vessels.

3. Dissect and demonstrate various parts of a fetus .

4. Prepare tissue blocks ,perform H&E staining and is able to explain the principles of the following special stains -silver nitrate, periodic acid Schiff, osmic acid, Masson trichome, Verhoeff and Orcein stains .

5. Prepare and deliver lectures on various topics of human anatomy using audio-visual aids.

6. Operate computers so as to prepare documents, tables, charts and projection slides.

7. Identify research topics; carry out research and prepare a dissertation on a topic.
8. Present paper / poster in conferences.
9. Set undergraduate theory question paper, evaluate students and able to compute results including internal assessment marks.

III. Affective domain: At the end training the students should be able to

1. Co-operate with and react and respond in a cordial manner in his /her interaction with peers, superiors and subordinates.
2. Project a cheerful persona to the students.
3. Inspire the students to reach greater heights.
4. Arouse an element of curiosity and wonder in the minds of students.
5. Maintain a log book (Appendix - I).
6. Develop a healthy personality and a liking and respect for the subject.

C. COURSE DESCRIPTION

I. Eligibility: As per the guidelines of Medical Council of India and affiliated university.

II. Duration: 3 years

III. Desirable qualities: The student should have an aptitude for teaching and reasonable command over spoken and written English language

IV. Details of Training: **T**he P.G. student would be a resident in the department for 3 years. The time-plan and the proposed division of curriculum will be on the following lines.

1. FIRST YEAR OF RESIDENCY

a. ***Orientation programme***- Institutional and departmental orientation including duties and responsibilities of a postgraduate student.

b. ***Time Management*** - should be conducted within 3-6 month.

c. ***Stress Management***- should be conducted within 3-6 months.

d. **Gross anatomy**: Dissection of one whole human body and study of gross anatomy and acquisition of embalming skills.

e. **Microanatomy**: Basic techniques in tissue processing, preparation of blocks, microtome sections and H & E and principles of the following special stains -silver nitrate, periodic acid Schiff, osmic acid, Masson's trichome, Verhoeff and Orcein stains.

f. To attend all undergraduate lectures held in the department of Anatomy and all the lectures organized by the university by various PG teachers at different colleges.

g. To present the topic for dissertation and the research design in front of a dissertation committee comprising of all senior and PG teachers in the department within first six months of registration. Thereafter periodic assessment of the progress of the dissertation (every 6 monthly) will be done by the concerned PG teacher and if required, by the dissertation committee.

h. Get trained to use computer for teaching and use the internet

i. Scan Anatomy journals and periodicals.

j. **OPTIONAL yet DESIRABLE**: To attend all the orations/ seminars/ workshops held for the subject in the city colleges, attend general orations held in the institution and attend regional /national conferences.

k. **TEACHING**

i. 70 hours of small group teaching with at least l/3 of these under supervision by a senior teacher.
ii. **Microteaching sessions** are mandatory before small group teaching for each and every session.
iii. Should be exposed to evaluation techniques
iv. Exposure to Medical Education Technology Workshops
v. Presentation in Journal club.
vi. Presentation in Seminars and symposia.
vii. Should complete gross and microanatomy journals.

l. **RESEARCH**

i. Basic techniques like review of literature for a given topic and collection of data.
ii. Exposure to computer for various applications.

2. II YEAR OF RESIDENCY

a. SPECIAL POSTING

Interaction with other pre, para and clinical specialties so as to prime the mind of the P.G. students in Anatomy to the growing needs of application of anatomical knowledge to other branches of medicine .This will be achieved through **horizontal and vertical integration**.

Posting

i. Horizontal Integration

(Selected topics should be taken as PG lectures by the concerned departments.)

Physiology and Biochemistry

ii. Vertical integration (Lectures to be arranged by the various departments for PG students)

Radiology, Surgery, Orthopaedics, Medicine, Obs &Gynac, Genetic Laboratory Pathology, Microbiology& Forensic.

(Posting in pathology - to gain knowledge about Frozen-sections, use of cryostat. special immunohistochemical techniques and immunological techniques and morbid and medicolegal anatomy from postmortem.)

During vacation.

b. RESEARCH

Starting the work on thesis by the beginning of second year of residency with the aim to complete the data collection & analysis by the end of second year.

c. TEACHING

i. From middle of IInd year, the P.G. students in Anatomy should be capable of giving lectures for the entire batch of students.
ii. Start teaching Embryology and Genetics in small groups after microteaching Sessions.
iii. Should be conversant with the use of various audiovisual aids

d. Presentation in Journal Club

e. Presentation in Seminars / Symposia at the departmental and institutional level

f. FETAL DISSECTION: Should have dissected at least one fetus

3. III YEAR OF RESIDENCY

a. RESEARCH

i. Completion of Dissertation
ii. Presentation of paper in conference (optional but desirable)
iii. Writing articles for publication

b. TEACHING

i. Full fledged lectures, lecture-demonstration, small group teaching
ii. Seminars / Symposia
iii. Journal Club

c. DISSECTION - Exercise in window-dissection of various regions.

V. SYLLABUS

1. Postgraduate curriculum shall include the entire undergraduate curriculum as spelt out below (Appendix III) with modifications as under:
Levels 1 & 2 of U.G. curriculum will become Level 1 of P.G curriculum.
Levels 3 of U.G curriculum will become Level 2 of P.G. Curriculum
Levels.3 of P.G. Curriculum will include current trend and recent advances in the Concerned topic and historical aspects.

2. Additional topics to be covered

a. History of anatomy
b. Embalming techniques
c. Microanatomy
   i. Principles and types of Electron microscopy: TEM, SEM
   ii. Identification of various cell organelles and their EM appearance

a. Embryology: Stem Cell.
b. Genetics : a)Exposure to various DNA technologies, including cell culture, Karyotyping, Polymerase Chain Reaction (PCR) and Fluorescent-in-Situ-Hybridization (FISH)
c. Neuroanatomy: Limbic system and Reticular Systems - Details
d. Clinical Anatomy: Application of anatomical knowledge to explain the anatomical basis of various clinical symptoms and signs, diagnostic procedures and treatment modalities
e. imaging Modalities
   i. Radiology
   ii. Ultrasonography (USG): - Principles of USG, Orientation of anatomical organs, in various USG plates. Structures as seen in 2-D echocardiography axes used and orientation of heart in various axes in 2-D echocardiography.
   iii. PET scan: Principles.

f. Forensic Anatomy: Estimation of age and sex
   i. With reference to bones including ossification
   ii. With reference to radiology pictures
g. Cross-sectional Anatomy and its correlation to C.T. scan images and MRI images
h. Comparative Vertebrate Anatomy: Basic outline
l. Anthropology: Basic principles and anthropometry

D. EVALUATION

I. FORMATIVE: Internal assessment based on

1. Teaching: to be evaluated based on a given proforma (Appendix II)
2. Dissection
3. Log Book
4. Journals-Microanatomy and Gross anatomy
5. Examinations

a. Theory:

i. At the end of first year, two papers on general anatomy, gross anatomy, and microanatomy of the

* Upper half of the body: Head (without neuroanatomy), neck, upper limb, thorax and general anatomy.

** Lower half of the body: Diaphragm (Thoracoabdominal), abodomen, lower limb and general microantomy.

ii. At the end of second year, two papers on

* Embryology and Genetics (Including a. i. **).

** Neuroanatomy and applied anatomy (Including a. i. *)

30% of the paper will be constituted by multiple choice questions of the following types: Single best response, multiple true false, multiple completion and assertion reason.

iii. At the end of third year, preliminary examination as per the university examination

b. Practicals and viva

i. At the end of first year,

* Prepare a tissue block, stain and discuss. 10 microanatomy spots.

** Window dissection and viva on Osteology and soft parts.

ii. At the end of second year

* Viva on embryology models (Including b. i. *)

** Viva on brain (Including a. i. **)

iii. At the end of third year, preliminary examination as per the university examination.

II. SUMMATIVE

1. By points system – The following point scale should be strictly adhered to Points in fractions should not be assigned.

Point System	Remarks
0(Zero)	Very poor
1(one)	Poor
2(Two)	Below Average
3(Three)	Average
4(Four)	Good
5(Five)	Very Good
6(Six)	Outstanding

a. Theory: 4 papers (***As per Direction No. 01/2008 dtd. 26/05/2008 & practical scheme is as per revised practical marksheet.)***

E. LIST OF RECOMMENDED BOOKS

I. Textbooks:

1. Cunningham's Manual of Practical Anatomy - Latest editions of volumes I, II, III
2. Regional & Applied Anatomy - R. J. Last
3. Clinical Anatomy for Medical Students - Richard Snell
4. Synopsis of Surgical Anatomy - McGregor
5. Functional Histology - Wheater, Burkit,
6. Langman's Medical Embryology
7. Embryology by Keith Moore
8. Clinical Neuroanatomy – Snell
9. The Human Nervous System - Murray Barr, John Kieman
10. Genetics by Emery
11. Human Genetics - S.D. Gangane
12. Essential of Human Genetics by Bhatnagar, Kothari and Mehta
13. Cross-sectional anatomy by Bo, Meehan and Kruger
14. Principles of General anatomy by A. K. Dutta
15. Comparative anatomy A.S. Romer.

II. Reference Books:

1. Gray's Anatomy
2. Clinical Anatomy _ NMS Series
3. Anatomy for Surgeons - Henry Hollinshead
4. Surgical Anatomy - Harold Ellis
5. Bailey's Textbook of Microscopic Anatomy
6. Embryology - Boyd & Mossman
7. Clinically oriented anatomy _ Keith Moore
8. Atlas of Human Histology – Di fiore
9. Tissues of the Human Body by Le Gros Clerk
10. Genetics by Thompson and Thompson
11. History of Anatomy - Charles Singer
12. History of Anatomy Indian Medicine - Kutumbiah
13. Dorlands Medical Dictionary

III. Journals:

1. Journal of Clinical Anatomy
2. Surgical & Radiological Anatomy
3. Journal of Anatomy
4. Development Dynamics
5. Anatomical Record
6. Journal of Anatomical Society of India

Appendix I (LOG BOOK)- Not yet FINALIZED

Log book details

Sr.No.	Date	Time	Topic /Activity	Teacher	Remarks and sign of PG teacher

*Topic – Topic of lecture/Demonstration attended
Topic of Lecture/Demonstration taught

*Activity- Dissection – Part

- Microanatomy- Practical
- Special posting- Department

** Fortnightly submission of the logbook to the concerned PG teacher and signature obtained

Appendix II

Direction- Please tick the statement, which most closely corresponds to your observation.

Name of the teacher : _____

Topic : _____

Date : _____

SrNo	Skill		Teacher Action	Yes	To some extent	No
1	Set Induction	a)	Aroused interest at the beginning			
		b)	Specified objectives of presentation			
2	Planning	a)	Organised material in a logical sequence			
		b)	Used relevant content matter			
3	Presentation	a)	Fluency in language			
		b)	Used non verbal cues, eye contact etc			
4	Interaction	a)	Allowed questions from students			
		b)	Asked Questions			
		c)	Rewarded pupil effort			
		d)	Clarified doubts			
5	Use of A V aids	a)	Used proper A V aids			
		b)	Used the aid effectively			
6	Summarization	a)	Summarized the important points at the end			
		b)	Checked that all the students understood the Points			
		c)	Lesson on the whole was effective			
7	Any suggestions for the speaker to improve the Teaching/earning exercise					

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES,NASHIK.

SYLLABUS FOR M.D. BIOCHEMISTRY

May 2006 ONWARDS.

Goal :

The broad goal of teaching & training of postgraduate students in Medical Biochemistry is to make them understand the scientific basics of the life processes at the molecular level and to orient them towards the applications of the knowledge acquired in solving clinical problems. At the end of his/her training, the student shall be able to take up a career in Teaching Institution or in diagnostic laboratory or in Research.

OBJECTIVES:

A) KNOWLEDGE:

At the end of the course the students shall be able to:

1) Explain the structure, function & inter-relationships of bimolecules & their deviation from normal & their consequences.
2) Summarize the fundamental aspects of enzymology & alteration on enzymatic activity with reference to clinical applications.
3) Explain the molecular & biochemical basis of inherited disorders with their associated sequel.
4) Explain the mechanisms involved in maintenance of body fluids & pH homeostasis.
5) Integrate the various aspects of metabolism & their regulatory pathways.
6) Outline the molecular mechanisms of gene expression & regulation, the principles of genetic engineering & their application in medicine.
7) Explain the molecular concept of body defenses & their applications in medicine
8) Explain the biochemical basis of environmental health hazards, biochemical basis of cancer & Carcinogenesis.

9) Familiarize with the principles of various conventional & specialized laboratory investigations & instrumentation analysis and interpretation of a given data.
10) Effectively organize & supervise diagnostic laboratory to ensure quality control/Assurances.

B) SKILLLS:

At the end of the course the students shall be able to:

1) Make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening & diagnosis.
2) Analyze & interpret investigative data.
3) Demonstrate the skills of solving scientific & clinical problems and decision-making.
4) Develop skills as a self-directed learner, recognize continuing educational needs, select & use appropriate learning resources.
5) Demonstrate competence in basic concept of research methodology & be able to critically analyze relevant published research literature.

C) INTEGRATION:

The knowledge acquired in Biochemistry shall help the students to integrate molecular event with structure & function of the human body in health & disease.

1) Eligibility – Recognized degree of M.B.B.S. or its equivalent recognized qualification.
2) Duration of course shall be of 3 (Three) years from the date of admission.

PERIOD OF TRAINING:

Duration of the course shall be of three years (six academic terms) from the date of admission.

1) The students will attend all U.G. lectures and practicals and will work in central clinical laboratory of the hospital and do all the routine, emergency and special investigations.

2) The students will be posted in the Dept. of Pathology & Microbiology for a period of one month each to learn hematology ,Blood grouping & serology etc.
3) The students will be posted in the Dept. of Medicine to study the Clinical cases for a period of 3 months. However, they will attend P.G. activities and duties in in the Department of Biochemistry & Central Clinical Laboratory of the Hospital.
4) Students will paticipate in P.G. activities ; viz, Seminars ,Group discussion, Journal club etc. and will attend P.G. Lecture
5) Students should learn basic knowledge of computers and medical statistics.
6) Training in Medical audit ,management , health economics , health information system,basics of medical statistics & bioinformatics , exposure to human behavioural studies & medical ethics shall be imparted to the P.G. students.
7) They will be required to participate in the teaching & traning programmes of U.G. students.
8) They will be granted a term provided they will put 80% attendance during the academic term.

SCHEME OF EXAMINATION

(*As per Direction No. 01/2008 dtd. 26/05/2008)*

Syllabus For M.D. Biochemistry

Paper I (General Biochemistry and Instrumentation)

1) History & scope of Biochemistry.
2) Cell structure & biochemical functions .Membrane structure & functions.
3) Transport through biological cell membrane
4) Chemistry & biological importance of carbohydrates ,proteins & amino acids, lipids , nucleic acids, porphyrins glycosaminoglycans, glycoproteins.
5) Chemistry of blood & hemoglobin, plasma proteins,Blood coagulation.
6) Enzymes & coenzymes –chemistry ,nomenclature properties & mode of action of enzymes,Enzyme kinetics, factors affecting enzyme activity,enzyme inhibitions,applications of enzymes & isoenzymes.
7) Bioenergetics & biological oxidation-General concept of oxidation & reduction.Electron transport Chain (ETC)- functioning of ETC & inhibitors of ETC, Oxidative phosphorylation,Uncouplers and theories of Biological oxidation & oxidative phosphorylation.
8) Principle, working & applications of, a) Colorimetry b)Spectrophotometry c)Flame photometry d) Flurometry e)Atomic absorption spectroscopy g) ultra centrifugation
9) Principle, types& applications of , a)Electrophoresis b)chromatography
10) Autoanalyzers, Blood gas analyzers
11) Automation in clinical chemistry
12) pH, electrodes & methods of pH determination.
13) Basics of Mass spectroscopy, Nuclear Magnetic Resonance, chemiluminescence and Electron - microscopy
14) Environmental Biochemistry – Definition, importance of pollution free & ecofriendly environment, exposure to cold stress, exposure to heat , air pollution water pollution & food pollution
15) Immunochemistry – The Immune system, Immunoglobins, antigen –antibody mediated immunity, mononuclear phagocytes –macrophages ,elements of clinical immunity.

Paper- II: METABOLISM AND NUTRITION

1) Digestion & absorption from gastrointestinal tract.
2) Intermediary metabolism, metabolism of Carbohydrates, Lipids, Proteins , and Amino acids , Nucleic acids,Hemoglobin, metabolic control, energy production & regulation.
3) Metabolic interrelationships & regulatory mechanisms
4) Metabolic changes during starvation
5) Energy metabolism-Calorimetry, BMR- its determination & factors affecting it, SDA of food.
6) Macro & micro –elements & their role in health & disease, water metabolism & its regulation.
7) Vitamins- chemistry, biological importance , deficiency manifestations & recommended daily allowance.
8) Principles of Nutrition –Balanced diet & its planning, Nutritive importance of various food sources, Calorific value of food , toxins & additives , Obesity, Protein Energy Malnutrition (PEM)- Kwashirkor & Marasmus .
9) Diet in management of chronic diseases viz, Diabetes mellitus, Coronary artery disease, Renal disorders, Cancer, Hypertension, Anemia ,Rickets & Osteomalacia.
10) Diet for over weight person, pregnant woman and during lactation

PAPER –III CLINICAL BIOCHEMISTRY

1) Chemistry, composition & functions of lymph, CSF, ascitic fluid, pleural fluid, & synovial fluid.
2) Urine formation, excretion & urine analysis.
3) Composition, chemistry & functions of specialized tissues like muscle, bone, nerve, connective tissue, & brain adipose tissue.
4) Chemistry of respiration & acid base balance& imbalance
5) Hormones-: Communication among cells & tissues. Hormone- General mechanism of action of hormones, chemistry, functions, synthesis of steroid hormones , polypeptide hormones, & thyroid hormones. Chemistry & functions of hormones of pancreas, and parathyroid. Local hormones. Clinical disorders of hormones, Hormone receptors.
6) Biochemistry of Diabetes mellitus, Atherosclerosis, Fatty liver, and obesity.
7) Organ function tests
   a) Liver function tests
   b) Kidney function tests
   c) Thyroid function tests.
   d) Adrenal function tests
   e) Pancreatic function tests
   f) Gastric function tests
8) Radioisotopes & their clinical applications.
9) Biochemistry of aging.
10) Neurochemistry in Health & Disease.
11) Biochemical changes in pregnancy & lactation.
12) Water & electrolytes balance & imbalance.
13) Total Quality Management of Laboratories.
   a) Internal Quality control
   b) External Quality control
   c) Accreditation of laboratories
14) Basics of Medical statistics
15) Inborn errors of metabolism.
16) Biotrasformations of Xenobiotics
17) Basic concepts of Biochemical Defense Mechanisms

Paper IV

MOLECULAR BIOLOGY , BIOTECHNOLOGY & RECENT ADVANCES IN CLINICAL BIOCHEMISTRY

1) Central dogma, genetic code, protein biosynthesis & its regulation.
2) DNA: structure, functions, replications, Mutation & repair of DNA, Sequencing of nucleotides in DNA, Mitochondrial DNA, and DNA recombination.
3) RNA: composition, types, structure & functions.
4) Role of Nucleic acids in diagnosis of Molecular diseases & infectious diseases
5) Mitochondrial DNA & diseases.
6) Human Genome Project.
7) Genes & chromosomes, Gene mapping, Chromosome walking etc.
8)Gene expression & gene amplification & gene regulation, Oncogenes, & biochemistry of cancer.
9) Genetic engineering: Recombinant DNA technology & its applications. Restriction endonucleases, Plasmids, Cosmids, Gene cloning, Gene libraries.
10) Basics techniques in genetic engineering.
    a) Isolation & purification of DNA, Methods of DNA assay.
    b) Blotting techniques – Southern, Northern & Western blotting.
    c) Polymerase chain reaction & its applications.
    d) Ligase chain reaction & its applications.
11) Tumor markers & growth factors
12) Biotechnology: Gene therapy, Nucleic acid hybridization, and DNA probes, Microarray of gene probes.
13) Genomics and Proteomics
14) Medical Bioinformatics
15) Lipid peroxidation, free radicals & antioxidants, Nitric oxide formation & its metabolism & its role in Medicine.
16.)Biochemistry of AIDS
17.)Genetic control of Immunity
18.)Research Methodology & Medical ethics.

SYLLABUS FOR PRACTICALS :

1) All undergraduate practicals and routine emergency and special investigations carried out in central clinical laboratory of the hospital,which are useful for diagnosis and prognosis of the disease.
2) Total Quality Management of Laboratory
   a)Specimen collection , handling & storage of sample.
   b) Methods of standardization & calibration.
   c) Methods of quality control & assessment.
3) Fractionation & Identification of,

   a) Amino acids b) Sugar c) Proteins d) Lipoproteins by

   i) Thin Layer Chromatography ii) Paper chromatography (circular, Uni-dimensional& two dimentional iii) Gel electrophoresis- agarose, starch, & Polyacrylamide Gel Electrophoresis iv) paper electrophoresis & cellulose acetate paper electrophoresis .

4) a) Estimation of total activity of following enzymes .
   i. LDH & seperation of its isoenzymes by Polyacryamide gel electrophoresis, Cellulose acetate electrophoresis & quantitation by densitometry.
   ii. AST(GOT)
   iii. ALT(GPT)
   iv. Alkaline phosphatase
   v. Acid phosphatase
   vi. Amylase
   vii. Creatine kinase its Isoenzymes

   b) Enzyme kinetics and Determination of Km value and effect of pH substrate concentration & temperature on Enzyme activity.
   c) Endocrinology: Estimation of Hormones.

5) Isolation of DNA and PCR technique.

6) Estimation of serum lipid profile .

i) Serum total cholesterol

ii) Serum HDL cholesterol

iii) Serum VLDL & LDL

iv) Serum Triglycerides

v) Serum Phopholipids

7) Estimation of Fe & Total Iron Binding capacity,& ferritin

8) Estimation of Glycosylated Hb.

9) Body fluid analysis - Urine
- CSF
- Ascitic fluid
- Pleural fluid

10) Estimation of VMA.

11) Estimation of Na, K & Lithium by Flame photometer.

Dissertation:

The dissertation is compulsory for candidates registered for P.G. degree & should include candidates own work under a supervisor , qualified for the purpose & recognized as a P.G. teacher by the University. The subject of dissertation along with synopsis (about 200 words) signed by P.G. teacher, H.O.D.& Head of the Institution will be submitted to the University. Ethics Committee of the Institution must approve the topic of dissertation.

Completed dissertation will be submitted to the University in the 5th term, that is, 6 month before the date of final examination.

Books recomonded:

1)Bichemistry Ed Lubert Stryer . W.H. Freeman & company ,New york.

2)Principles of Biochemistry . Ed. Lehninger , Nelson & Cox .
CBS publishers & distributers .

3)Harpers Biochemistry Ed. R.K. Murray , D.K. Granner, P.A. Mayes & V.W.Rodwell.
Appleton & Lange ,Stanford ,Conneticut.

4)Textbook of Biochemistry with clinical correlations. Ed. Thomas M. Devlin.
Wiley Liss Publishers.

5)Genes VI Ed. Benjamin Lewin .
Oxford University press.

6) Tietz Textbook of Clinical chemistry, Ed. Burtis & Ashwood W.B.
Saunders Company.

7)Principles & techniques of practical Biochemistry Ed. Keith Wilson & John Walker
Cambridge University press .

8)Biochemistry Ed. Donald Voet & Judith G. Voet
John Wiley & Sons ,Inc.

9)Molecular cloning –A laboratory Manual .J. Sambrook , E.F. Fritsch & T.Maniatis
Cold Spring Harbor Laboratory Press.

10)Molecular cell Biology , H.Lodish,A. Berk, S.L. Zipursky, P. Matsudaira ,D. Baltimore , J.Darnell.

11)Bio-technology 1st edition . U. Satyanarayan.
Books & Allied Publisher (p) Ltd.Kolkatta.

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

CURRICULUM OF M.D. IN COMMUNITY MEDICINE

GOAL

The overall goal of training programme is to produce a competent public health specialist who can function as a leader of health team and is able to provide effective health care at the primary, secondary and tertiary levels.

GENERAL OBJECTIVES

The general objectives of the training programme in Community Medicine will be to enable a candidate to be a :

Public Health specialist to

1. Define and manage the health problems of the community, which he/she serves. He/she should be able to organize epidemiological studies to identify health problems.
2. Plan, implement and evaluate various health programs in his/her area, especially National Health, Family Welfare and disease control / eradication programmes.
3. Select, train supervise and manage various categories of health personnel working with him/her.
4. Organize health care services, routine and for special groups and during periods of special needs such as disasters/calamities and epidemics.
5. Should update himself / herself on latest advances / developments in the field of Public Health

Teacher / Trainer to

1. Plan and conduct an educational session/ programme. He/she will be able to draw up lesson plan with details of educational objective, content, process and essential inputs.
2. Assist in development of curriculum, teaching and learning activities and methods of evaluation
3. Assist in manpower planning and development. He/she should be able to participate in programmes for the selection, training and supervision of various cadres of health personnel

Research to

1. Plan and execute a research study including clinical trails. Use/Organize Biostatistical analysis using computers and softwares and prepare reports/papers.
2. Critically evaluate research activities
3. Make recommendations on policy and procedures.

Special Objectives

At the end of the MD program in Community Medicine the student will

1. Know the structure and functioning of the health system at the National and International levels and its historical perspectives.
2. Know the principles of nutrition, maternal health and family welfare and put the same into practice.
3. Apply the principles of Epidemiology and Biostatistics to health practice including the design and implementation of health related research studies and clinical preventive medicine trails.
4. Know the principles of Communicable and Non-communicable diseases control and assist in the implementation of National Health programmes at a program level.
5. Identify the socio-cultural dimension in Health and disease and apply this knowledge in the design and implementation of an integrated Health and development program.
6. Apply the principals of environmental and occupational health in the design of health programmes aimed at improving health status.
7. Access specific health situations in a population, plan, organize , implement and evaluate programs aimed at improving health situations.
8. Identify the health needs of the special groups within populations especially the aged, the disabled and the worker and to respond to that need.
9. Know the principles of learning and apply this knowledge in facilitating the learning process in groups of people involved in health.
10. Relate his/her knowledge of curative medicine to the improvement of the health status of a given population.
11. Identify the role of the Government, Private and Voluntary sector in health and understand the principles of innovations in health practices and research.

COURSE CONTENTS.

Health Systems in India and The World – Historical Perspective

1. History of Public Health in India
    - History of Health Services in India
    - Indigenous Systems of Medicines in India
    - Bhore Committee's and other "Committee Reports on Health Services, Health care and Health Professional Education in India.
    - National Health Policy
    - An update of achievements of the country vis-à-vis the Health for all Indicators
2. History of Public Health in the World
    - Influence of the various systems of Medicine i.e. Chinese, Mesopotamian, Egyptian, Geek etc.
    - Concepts in Public Health
        - Disease Control
        - Health Promotion
        - Social Engineering
        - Health for All
3. Primary Health Care
    - Concepts of Primary Health Care
    - Principles of Primary Health Care
    - Elements of Primary Health Care
    - Models of Delivery of Primary Health Care
    - Current status of Primary Health care the world over

4. The Health Care System in India – Structure and Function
    - Central Level
    - State Level
    - District Level
    - Taluka Level
    - Primary Health Centre Level
    - Village Level
    - Urban Level

SOCIO- CULTURAL DIMENSION IN HEALTH

1. Principles of Sociology and the Behavioral Sciences
    - Concepts of Sociology and Behavioral Sciences
    - Influence of Social and Cultural Factors on Health and Disease
    - Social Structures and Social Organisation
2. Principles of Social Psychology
    - Principles of psychology
    - Principles of behavioral sciences
    - Principles of social anthropology
3. Application of Sociology in Health and Development
    - Social Problems in Health and Disease
    - Use of Sociology in addressing problems in Health and Disease

PRINICIPLES OF EDUCATIONAL SCIENCE AND TECHNOLOGY

- Curriculum Planning, Educational objectives
- Principles of Learning
- Teaching/ Learning methods
- Teaching skills including Micro Teaching
- Preparation and Use of Teaching Aids and Learning Research Materials.
- Methods of Evaluation

PRINCIPLES AND PRACTICE OF INFORMATION, EDUCATION AND COMMUNICATION.

1. Principles of IEC Health Education
    - Objectives of Health Education
    - Content of Health Education
2. Communication Skills
    - Principles of Communication
    - Communication blocks
    - Body Language
3. The use of Media for IEC
4. Practice (Methods) of IEC and its application in Community Health
5. Evaluation of impact

PRINICIPLES OF NUTRITION AND APPLIED NUTRITION

1. Nutrients, Daily Requirements, Balanced Diet, Primordial Prevention of Lifestyle related disease.
    - Classification of Foods
    - Daily Requirements of Nutrients
    - Balanced Diet
    - Nutritional Profiles of Major Foods
2. Nutritional Deficiencies
    - Nutritional Requirements
    - Protein Energy Malnutrition

- Vitamin Deficiencies
- Mineral Deficiencies
- Deficiencies of Trace elements

3. Assessment of Nutritional status in a community and approach to a programme
   - Assessment of an Individual's Nutritional Status
   - Assessment of Community Nutritional Status
4. Nutritional Programmes in India – Critical Review
   - Nutritional Problems in India
   - Programmes to combat these problems
   - Nutritional Surveillance
   - Social Problems in Nutrition
5. Other Aspects of Nutritional
   - Food Borne Disease
   - Food Hygiene
   - Food Adulteration including PFA Act

PRINICPLES OF ENVIRONMENTAL HEALTH

1. Water
   - Sources of water
   - Water Pollution
   - Purification of water
   - Water Quality Standards
   - Water borne disease – Epidemiology and Control – Investigation of outbreak of water borne disease and report including water testing
2. Air
   - Indices of thermal comfort
   - Air Pollution including monitoring
   - Effects of air pollution and prevention and control
   - Ventilation
3. Housing including domestic and industrial housing standards
4. Noise and noise pollution
5. Radiation
6. Meteorological Environment including temperature, humidity and rainfall
7. Lighting
8. Disposal of Waste and Sanitation
   - Sources and Classification of wastes
   - Disposal of Solid Wastes
   - Excreta Disposal
   - Sewage Disposal
   - Health Care and Hospital Waste Management
9. Environmental Pollution
   - Sources of Environmental Pollution
   - Monitoring of Environmental Pollution
   - Prevention and Management of Environmental Pollution

10. Medical Entomology
    - Insecta: Mosquito, Flies, Lice, Fleas and Bugs
    - Arachnida: Ticks and Mites
    - Crustacea: Cyclops
    - Identification of the arthropods
    - Diseases transmitted by arthropods
    - Control of Arthropods and Disease borne by them
    - Insecticides and Insecticide Resistance
    - Rodents and Anti-Rodent Measures
    - Integrated Vector Control

MATERNAL HEALTH, CHILD HEALTH AND FAMILY WELFARE (RCH)

1. Common Maternal and child health problems at an individual level
    - Antenatal Care
    - Risk Approach
    - Antenatal visits
    - Preventive services
    - Intranetal Care
    - Postnatal Care
    - Care of the mother
    - Child Health Problems
    - Low Birth Weight
    - Growth and Development
    - Childhood Infections
    - Care of the infant
2. Genetics and Health
    - Common genetic problems
    - Management of Genetic Problems
    - Preventive and Social Measures in Genetics

3. Structure of MCH and Family Welfare services in India
    - Problems of Maternal Health in India
    - Delivery of Maternal and Child Health Services
    - Trends in the MCH services
    - MCH related programmes in India eg.RCH,CSSM,ICDS
    - Family Planning
    - Methods of family planning
    - Indicators of MCH care
4. Demographic Trends in India
    - Demographic Cycle
    - Trends in the world
    - Demography related indicators
    - Demographic trends in India
5. School Health services
    - Objectives
    - Components of school health services
    - Planning for school health services
    - Care of handicapped children
    - Behavioral and Learning Problems in Children

6. Social Paediatrics
    - Juvenile Delinquency
    - Child Abuse
    - Child Labour
    - Street Children
    - Child Guidance Clinic
    - Child Marriage
    - Child Placement

PRINICIPLES AND APPLICATION OF EPIDEMIOLOGIC METHODS IN HEALTH RESEARCH

1. Research Methodology
2. Principles of Epidemiology
3. Epidemiologic Studies
    - Descriptive
    - Analytical
    - Experimental

BIOSTATISTICS

Collection/ Organisation of data / Measurement scales
Presentation of data
Measures of Central Tendency
Measures of variability
Sampling and planning of health survey
Probability, Normal distribution and inductive statistics
Estimating population values
Tests of significance (Parametric/Non-parametric including qualitative methods)
Analysis of variance
Association, correlation and Regression
Vital statistics
Evaluation of health and measurement of morbidity / mortality
Life table and its uses
Use of computers
Census

PRINCIPLES OF TROPICAL MEDICINE

1. Infectious and non Infectious Disease Epidemiology
    - Respiratory Diseases such as Small Pox, Chicken Pox, Measles, Mumps, Rubella, Diphtheria, Pertussis, Influenza, Tuberculosis, ARI etc.
    - Intestinal Infections such as Poliomyelitis, Hepatitis, Food Poisoning, cholera, Enteric Fevers, Amoebiasis, Worm Infestations etc.
    - Arthropod Borne Infections such as Malaria, Filaria, Dengue and others
    - Zoonotic Diseases such as Brucellosis, Rickettsial Diseases, Parasitic
    - Surface Infectious Diseases of Public Health Importance
    - Non-Infectious Diseases of Public Health Importance
    - Cardiovascular diseases, diabetes, blindness, accidents, cancers
    - Emerging and reemerging disease

NATIONAL HEALTH PROGRAMMES

The origin, historical development, interventions, current state and critique of the different National Health Programmes: National Family Welfare Programme (NFWP)

- National Tuberculosis Control Programme
- National Leprosy Eradication Programme
- National Diarrhoeal Diseases Control Programme
- National Malaria Eradiation Programme
- National Filariasis Control Programme
- National Acute Respiratory Infections (ARI) Control Programme
- National AIDS Control Programme
- National Guinea Worm Eradication Programme
- National Kala Azar Control Programme
- National Japanese Encephalitis (JE) Control Programme
- National Iodine Deficiency Disorders (IDD) Programme
- National Programme for the Control of Blindness
- National Cancer Control Programme
- National Mental Health Programme
- National Diabetes Control Programme
- Child Survival and Safe Motherhood (CSSM)
- Reproductive Child Health (RCH)
- Universal Immunization Programme (UIP)
- National Water Supply and Sanitation Programme
- Minimum Needs Programme
- National Rural Health Mission

The implementation of NHPS at a programme level and in the community

COMMUNITY MENTAL HEALTH

1. Principles of Mental Health
    - Types, Causes and Warning signals of Mental Illness
    - Preventive aspects of mental Health
2. The Approach to Mental Health Problems in a Community
    - Primary Health Care approach to mental health problems
    - Mental Health Services in the country

OCCUPATIONAL HEALTH

1. Principles of Occupational Health
    - Occupational Environment
    - Occupational Hazards
    - Absenteeism
    - Problems of Industrialization
    - Health Protection of Workers
    - Prevention of Occupational Disease
2. Legislation in Occupational Health
    - Factories Act
    - Employees State Insurance Act
    - Workmen's Compensation Act
    - Mines Act
    - Plantation Labour Act
3. Basics of Industrial Toxicology
4. Principles of Industrial Psychology
5. Basics of Ergonomics

HEALTH CARE OF THE AGED AND THE DISABLED

1. Community Geriatrics
    - Implications of demographic charges in Indian Population
    - Health Problems of the aged
    - Preventive Health Services for the aged
2. The Disabled and Rehabilitation
    - Problem of disabled in the country
    - Types of disabilities and their management
    - Rehabilitation of the disabled
    - Community Based Rehabilitation

Health Care of Tribal people

VOLUNTARY SECTOR IN HEALTH

Role of the Voluntary Sector in Health

- Activities undertaken by Vos in the Health Sector
- Activities of specific Vos in Health
- Innovative Approaches in the Voluntary Effort in Health

HEALTH CARE ADMINISTARTION AND HEALTH MANAGEMENT

1. Principles of Planning and Evaluation
    - Plan Formulation
    - Execution
    - Evaluation
    - Planning Cycle
2. Health Management
    - Methods and Techniques of Health Management
    - Behavioral Sciences in Management
    - Quantitative Methods in Health Management
3. Basics of Health Systems Research
4. Basics of Health Economics
5. Basics of Health Information Systems

RECENT ADVANCES AND TOPICS OF CURRENT INTEREST

1. Rational drug policy, Nutrition Policy, Health Policy, Population Policy
2. Computers in Health
3. Agricultural Medicine and Plantation Health
4. Introduction to Counseling
5. Community Ophthalmology
6. Qualitative Research and Operational Research
7. Disaster Management and Public health emergencies
8. Nosocomial Infection and Hospital Infection Control
9. Other Free Topics

COURSE CONTENTS FOR PRACTICALS

1. Microbiology applied to Public Health (Dept.of Microbiology)
    - Hands off experience in staining techniques and interpretation of:
    - Leishmann stain
    - Grams Stain
    - JSB Stain
    - Alberts Stain
    - Ziehl-Neilson Stain
    - Peripheral blood examination of Thick and Thin Smears and Reporting
    - Collection and Dispatch of Samples to Laboratory
    - Experience in the collection, examination and interpretation of simple laboratory tests on blood, stool and urine.
    - Interpretation of commonly used serological tests such as Widal/HIV/Hepatitis B/VDRL/Viral Antibody Titres
2. Medical Entomology
    - Collection of mosquitoes/fleas/ticks/other
    - Hands on experience on mounting and reporting
    - Entomological Survey
3. Public Health Chemistry
    - Interaction of Commonly used tests with reference water solutions / water purifiers
4. Epidemiological Exercises and Case Studies (including family studies) to illustrate principles and practice of community Health
    - Statistical Exercises to illustrate Principles and Practice
    - Investigation of an Outbreak of a disease and Measures to control
5. Exercises in Public Health Administration
    - Planning Exercises
    - VED Analysis etc
    - Beneficiary Need Analysis
    - Preparation of Annual Plan
    - Budgeting at the PHC level
    - Supervision of a PHC/SC
    - Requirement of Vaccines, Medicines, Stationary at the PHC level
    - Organisation of a Family Welfare Camp
    - Conduction of an Immunization Camp
6. Diet and Nutritional Survey of a Community
    - Collection and Dispatch of Food Samples
7. Study of Environment and its influence on health in
    - Work Places
    - House-hold
    - Community
    - This includes the study of air pollution, noise pollution, temperature, humidity and other meteorological factors and their effect on health.
8. Study of sanitation problems to illustrate the principles and practice of community health
9. Environment Sanitation
    - Collection of Water Samples / Analysis / Reporting
    - Analysis of physical, chemical and microbiological quality of water
    - Study of Waste Management Methods
    - Adaptation of water supply methods and waste disposal methods to an industry or Plantation setting
    - Study of Requirement of Water in Urban and Rural Setting

10. Visits/ Postings to the following institutions

- District Health Office
- District Hospital
- Taluka Hospital
- PHC/ SC/CHC
- ICDS office / Anganwadi Centre
- Public Health Laboratory
- Sewage Treatment Plant
- Visit to Local Ward Office
- Infectious disease Hospital
- Malaria/DTC/Filaria units
- Visit to factory/Inspectorate of factories/ visit to Industry
- Home for the aged
- Blindness Rehabilitation schools
- Deaf and Dumb schools
- Spastic society
- Physically Handicapped Centre
- Market Place
- Slaughter Home
- Hotel
- Milk Dairy
- Food and Beverages Processing Units

Posting to Obstetric and Gynecology

1. Obstetrics (Urban and Rural Health Centres)
    - Antenatal Care
    - High Risk pregnancy
    - Intranetal care – The Management of normal Labour
    - Postnatal Care
    - Family Welfare
2. Gynecology
    - Adolescent Health
    - Reproductive Tract Infections
    - Cancer of the reproductive tract especially Carcinoma cervix

Posting to Paediatrics (Hospital and ICDS)

1. Paediatric Infectious diseases
2. Nutrition problems
3. Immunization
4. Neonatal Problems
5. Growth and development monitoring

Students doing MD Community Medicine can be allowed to do one semester / Posting in Obst Gynace / Medicine / Paediatric in 2nd Year.

TRAINING ACTIVITIES (for 3 years)

The entire training and the facilitation of the learning process will be aided through the following methods of learning:

1. Lecture Discussions
2. Problem Based Learing
3. Practical Demonstarions
4. Field visits – Family Studies / Clinico-Social Case Studies/ Site Visits
5. Institutional Visits
6. Seminars
7. Journal Clubs
8. Epidemiological Exercises
9. Supervised Training of undergraduates including Lesson Planning
10. Involvement in Specific Departmental Project works
11. Plan, Design, Conduct Surveys

METHODS OF MONITORING :

1. Self Evaluation – Through daily Work Diary
2. Faculty Evaluation – Through scrutiny of Diary and Log Book by Head of Department and staff
3. Technique of skills in Pedagogy – Through lesson plans and supervised taking of classes for undergraduates
4. Skill Evaluation – through demonstration and practical and field reports
5. Knowledge Evaluation – through journal clubs, seminars and tests.

FORMATIVE EVALUATION : The students will be evaluated by work diary and log book. It is mandatory to get a score of five in all items in order to get a final certification for appearing for M.D.University Exam.

THESIS

Objectives: By carrying out a research project and presenting his work in the form of thesis. The student will be able to :

- Identify a relevant research questions;
- Conduct a critical review of literature;
- Formulate a hypothesis;
- Determine the most suitable study design;
- State the objectives of the study;
- Prepare a study protocol;
- Undertake a study according to the protocol;
- Analyze and interpret research data; and draw conclusions;
- Write a thesis

GUIDELINES: While selecting thesis topics, following should be kept in mind:

- The scope of study should be limited so that it is possible to conduct it within the resources and time available to the student;
- The emphasis should be on the process of research rather than the results;
- The research study must be ethically appropriate.
- The protocol, interim progress as well as final presentation must be made formally to the entire department.
- Only one student per teacher/thesis guide
- There should be a training programme on Research Methodology for existing faculty to build capacity to guide research.
- Within 3 months of thesis submission the candidate should be communicated the acceptance / rejection of the thesis.
- The thesis should be sent to at least 2 reviewers and rejected if only both reject it.

Within 6 months the topic to be selected, protocol to be presented at Department level. Local Ethical Committee approval to be obtained at the end of 6 months. The title and synopsis to be communicated to the University

First 6 months : Topic Identification
Protocol Presentation
Submission of title and
Synopsis to University

Thesis submission to the university 6 months before the Final University Exam.

EVALUATION

SCHEME OF EXAMINATION (*As per Direction No. 01/2008 dtd. 26/05/2008)*

RECOMMENDED BOOKS AND JOURNALS

1. Maxy Roseman John M.Last, Maxcy-Roseman **Public Helath and Preventive Medicine**, Appleton-Centrury-Crofts, Newyouk
2. Hobson W, **The Theory and Practice of Public Health**, Oxford Med. Publication
3. Barker D J P, **Practical Epidemiology**, Churchill Livingstone
4. Park J E & K Park, **Text Book of P & S.M.**, M/s Banarsidasm Bhanot, Jabalpur
5. Mahajan B K and M/C.Gupta, **Text Book of P & S.M.**, Jaypee Publications
6. Bradford Hill, **Principles of Medial Statistics**, The Lancet Ltd. No.7 Adam Street, Adelphine, London, 1967
7. Mac, Mahon & Pugh, **Epidemiology-Principles and Methods**, Little Brown and Co.Boston, U.S.A.
8. **Hunter's Diseases of Occupations**, Edited by P.A.B.Raffle, P.H.Adams, P.J.Baxter and W.R.Lee Edward Arnold Publishers (1994), Great Britain.
9. Text book of PSM : A P Kulkarni and Dr. Baride
10. Epidemiology and Management for Health Care, Fifth Edition- P.V. Sathe and P.P. Doke, Vora Medical Publications, Mumbai
11. COMMITTEE REPORTS AND POLICY DOCUMENTS – MEDICAL EDUCATION AND HEALTH POLICY:
    1. Bhore Committee Report (1946) **Health Survey and Development Committee**, Govt.of India, Delhi.
    2. Mudaliar Committee Report (1961) **Health Survey and Planning Committee**, Govt. of India, Delhi
    3. Shrivastav Report (1974), **Health Services and Medical Education – A programme for immediate action, Group on Medical Education and Support Manpower, Ministry of Health and Family Welfare**, Govt.of India, New Delhi.
    4. ICSSR/JCMR (1981), **Health for All- An alternative strategy – Report of a Joint study group of ICSSR/ICMR**, Indian Institute of Education, Pune.
    5. National Health Policy, (1982) **Ministry of Health and Family Welfare**, Government of India, New Delhi.
    6. **Compendium of Recommendations of various committees on Health and Development** (1943-1975), Central Bureau of Health Intelligence (1985) Directorate General of Health Services, Ministry of Health and Family Planning, New Delhi.
    7. Bajaj, J.S. etal (1990) **Draft National Education Policy for Health Sciences**, I.J.M.E. Vol.29, No.1 & 2 (Jan-August 1990)

12. Epidemiology and Health Management: By Dr.P.V.Sathe
13. National Health Programmes of India : J.Kishore
14. Text Book of Infection Diseases : Christae
15. Preventive Paediatrics : O.P.Ghai
16. Statistics : K.Vishvesh Rao
17. Medical Entomology : A. K.Hati
18. Oxford Text Book of by Public Health : Holland & Detel

Journals

1. Indian Journal of Community Medicine
2. Indian Journal of Public Health
3. Indian Journal of Community Health
4. Journal of Communicable Diseases
5. Indian Journal of Medical and Child Health
6. Indian Journal of Preventive and Social Medicine
7. Indian Journal of Occupational Health and Industrial Medicine
8. Indian Journal of Medical Research
9. National Medical Journal of India
10. Indian Journal of Malariology
11. Indian Journal of Environmental Health
12. Indian Journal of Medical Education
13. Journal of Indian Medical Association
14. Journals of Medicine, Paediatrics, OBG, Skin & STD, Leprosy, Tuberculosis & Chest Diseases (For Reference)

International Journals

1. WHO Publications – All
2. Journal of Epidemiology & Community Health
3. Tropical Diseases Bulletin
4. Vaccine
5. American Journal of Public Health
6. Lancet
7. New England Journal of Medicine.

ADDITIONAL READING

1. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Helath Services, min.of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi.P-335.
2. National Health Policy, Min.of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983.
3. Santosh Kumar, The elements of Research, writing and editing 1994, Dept. of Urology, JIPMER, Pondicherry
4. Srinivasa D K etal, 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 Subject", 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, Bangalore,1993.
8. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.

9. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991;424-8
10. Kirkwood B R, Essential of Medical Statistics for Medical students, 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, J P Publication, 1998
1. Hunter (Donald), **Diseases of the Occupations**, 6th edition, Hodder and stooughton (1978)
2. Schilling (1978), **Occupational Health Practice**, Butterworth & Company, Great Britain
3. Plunkett (E.R), **Occupational Diseases**, Barret Book Company, Stanford (1977)
4. Johastone (R.T), **Occupational Diseases and Industrial Medicine**, Saunders, Philadelphia (1960)
5. French (Geoffery), **Occupational Health**, Medical Technical Publishers, Lancaster
6. Mayers (May R), **Occupational Health etc.**, Williams and Wilkins, Baltimore (1969)
7. Government of India, Ministry of HRD, **Occupational Health : issues of women in the unrecognized sector**, New Delhi (1988)
8. Plunkett (E.R), **Handbook of Industrial Toxicology**, 3rd Edition, Arnold Publishers, USA (1987)
9. Charles Wn Sharp and L Thomas Carroll, **Voluntary Inhalations of Industrial Solvents**, U.S. Department of Health, Education and Welfare, National Institute on Drug abuse, U.S.A. (1978)
10. Patric Kinnersly (1979), **The Hazards of Work, How to fight them**, Pluto Press U.K.
11. Plunkett (E.R) (1977), **Occupational Diseases,A Syllabus of Sings and Symptoms**, Barret Book Company, Stamford, Connecticut (1977)
12. Edited by Robert j.Mc Cunney, **Handbook of Occupational Medicine**, Little Brown and Company, Boston/Toronto (1988)
13. WHO (1986) Geneva, **Early detection of Occupational Disease**
14. **Hunter's Diseases of Occupations**, Edicted by P.A.B. Raffle, P.H.Adams, P.J.Baxter and W.R.Lee Edward Arnold Publishers (1994), Great Britain
15. Carl Zenz (1994), **Occupational Medicine**, 3rd Edition Mosby, U.S.A.
16. ILO Publications Geneva, **Encycloperia of Occupational Health and Safety**, (1983) 3rd Edition Vol.122.

Draft Syllabus Prepared by Sub Committee on 06/01/2014 as per meeting of BOS on 07/10/2013 & Faculty of Medicine 08/10/2013. To be Submitted to BOS on 20/03/2014 & Faculty on 21/03/2014

Final Syllabus passed by Academic Council on 21/05/2014 Item No. 28 /2014. Subject to Uniformity in the University Examination System.

FACULTY OF MEDICINE

SYLLABUS

FOR

M.D. & DDVL IN DERMATOLOGY, VENEREOLOGY AND LEPROSY

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

NASHIK

DERMATOLOGY , VENEREOLOGY AND LEPROSY — M D & DDVL

Dermatology including Venereology (STD) and Leprology is one of the important basic clinical speciality. Considerable advances have taken place in the understanding of dermatological disorders and their treatment. Leprosy is still a public health problem of considerable magnitude in the country. The STDs are showing worldwide increase in incidence with new dimensions added to it.
There is a dearth of trained personnel in the speciality. Very few medical college in the country impart sufficient knowledge about these diseases at Undergraduate level and Postgraduate courses are not available in all medical colleges.
The curriculum of MD Dermatology has been made designed matching the other clinical specialities at the Institute. An attempt has been made to give a comprehensive training to the postgraduates including basic subjects and recent advances.

OBJECTIVES

At the end of this training a candidate should be able to
1. Diagnose and manage independently common skin diseases, sexually transmitted diseases and leprosy.
2. Manage independently and efficiently all medical emergencies related with skin, leprosy and venereal disease.
3. Adopt preventive measures at individual and community levels against communicable skin, venereal diseases and leprosy.
4. Teach requisite knowledge and laboratory skills to other medical/paramedical team members.
5. Adopt a compassionate attitude toward towards the patients (and their families) under his/ her charge.
6. Critically evaluate and initiate investigation for solving problems relating to skin, venereal diseases and leprosy.

SKILLS TO BE LEARNT

1. History taking for dermatology, venereology and leprosy
2. Describe cutaneous findings in dermatological terms in a systematic way.
3. Evaluate and manage the common diseases in dermatology and have a broad idea how to approach an uncommon diseases.
4. Evaluate and manage STD cases
5. Evaluate and manage HIV positive cases
6. Systemic examination relevant for dermatologic condition
7. Maintain basic skills like pulse, blood pressure chest and cardiac auscultation learnt in MBBS
8. Care of dermatologic emergencies like TEN, Pemphigus, necrotic ENL, angioedema, drug reactions etc.
9. Management of pediatric cases with skin diseases
10. To achieve adequate skills for tests done in side laboratory in day-to-day practice and be familiar with other sophisticated investigations.

Fundamentals of Cutaneous Diagnosis-

Basic skin lesions, history taking, examination of the patient including relevant diagnostic, clinical tests and aids.

Duration of Course –

Full Time: 3 Academic Years for PG Degree Course and Full Time 02 Academic Years for Diploma course.

SYLLABUS

Topics Related to Allied Basic Sciences

The structure, function and development of human skin. Skin as a barrier
Ultra structural aspects of epidermis, epidermal appendages, dermoepidermal junction, dermis, and sub-cutis
Immunology, Molecular biology and genetics in relation to the skin.
Epidermal cell kinetics and Keratinization
Lipids of epidermis and sebaceous glands
Percutaneous absorption
Biology of eccrine and apocrine sweat glands
Biology of hair follicles, sebaceous glands and nails
Biology of melanocytes and melanin formation
Disorders of keratinisation
Epidermal proteins
Dermal connective tissue : collagen, elastin, reticulin, basement membrane and ground substance
Metabolism of carbohydrates, proteins, fats and steroids by the skin
Cutaneous vasculature and vascular responses
Mechanism of cutaneous wound healing
Cellular and molecular biology of cutaneous inflammation
Immunoligic aspects of skin
HLA system, Immunoglobulins, cyto kines
Complement system
Hyper-sensitivity and allergy
Cutaneous carcinogenesis
Basic of cutaneous bacteriology, mycology, virology, parasitology and defence mechanism.
Common laboratory procedures, stains culture media and related serological tests
Basic pathologic reaction pattern in skin
Common and special histopathological stains and procedures used in the diagnosis of skin diseases and Special techniques such as immunofluorescence, immunoperoxidase and other related techniques.

Clinical Dermatology

Epidemiology of cutaneous diseases
Pyschologic aspects of skin disease and psycho-cutaneous disorders
Pathophysiology and clinical aspects of pruritus.

Papulo-squamous Diseases

Psoriasis, Pityriasis rubra pilaris, pityriasis rosea Licen Planus, lichenoid eruptions
Parapsoriasis, Palmoplantar Keratodermas.
Darier.s disease. Prorokeratosis
Ichthyoses and ichthyosiform dermatoses, Keratodermas

Vesiculo-bullous Disorders

Pemphigus group of disorders
Bullous pemphigiod

Chronic bullous disease of childhood
Familial benign pemphigus
Herpes gestationis
Mechanobullous (hereditary and acquired)
Epidermolysis bullosa acquisita
Dermatitis herpetiformis
Erythema Multiforme
Subcorneal pustular dermatoses

Disorders of Epidermal Appendages

Disorders of hair and nails
Disorders of sebaceous glands : Acne
Rosacea, Perioral dermatitis,
Disorders of eccrine and apocrine sweat glands

Tumours

Naevi and hamartomas
Precancerous Skin lesions, Squamous cell carcinoma and Basal cell carcinoma, malignant melanoma.
Pagets disease, Keratoacanthoma.
Benign epithelial tumours, appendageal tumours

Disorders of pigmentation

Vitiligo Albinism, Benign neoplasia and hyperplasias of melanocytes, Dyplastic melanocytic nevi, hyperpigmentation

Inflammatory Disorders of the Dermis

Acute Febrile Neutrophilic dermatosis
Erythema elevatum diutinum
Cutaneous eosinophilic diseases
Granuloma faciale
Pyoderma grangrenosum
Erythema annulare centrifugum and other Figurate Erythemas
Granuloma annulare
Malignant atrophic papulosis
Neoplasms, Pseudo neoplasms and Hyperplasias of the Dermis
Vascular Anomalies, Kaposi.s Sarcoma
Anetoderma and other Atrophic Disorders of the skin
Neoplasias and hyperplasias of Neural and Muscular origin
Elastosis Perforans Serpiginosa, Reactive Perforating Collagenosis, Kyrle.s disease

Lymphomas, Pseudolymphomas and Related Conditions

Disorders of Subcutaneous Tissue

Panniculitis
Lipodystrophy
Neoplasms of the subcutaneous Fat

Disorders of the Mucocutaneous Integument.
Biology and disorders of oral mucosa
Disorders of anogenitalia of males and females

Cutaneous changes in disorders of altered reactivity

Genetic Immunodeficiency Disease
Urticaria and Angioedema
Disorders associated with complement abnormalities
Graft-versus-Host Disease
Muco-cutaneous manifestations in immunosuppressed host other that HIV-infection
Contact Dermatitis
Auto sensitization dermatitis
Atopic dermatitis (Atopic Eczema)
Nummular eczematous dermatitis
Seborrhoeic dermatitis
Vesicular plamoplantar eczema
Erythrodermas

Skin Changes Due to Mechanical and Physical Factors

Occupational skin disease
Radiobiology of the skin.
Skin problems in amputee.
Sports Dermatology.
Skin problems in war field.
Decubituls ulcers.
Radiation to the skin
Skin diseases due to cold, heat

Photobiology of skin

Normal reaction to ultra violet rays and sun exposure

Disorders Due to Drugs and Chemical Agents

Erythema multiformae, Stevens-Jhonson syndrome, toxic epidermal necrolysis and
Cutaneous reactions and mucocutaneous reactions to chemicals and drugs
Pathological response to UVR and sun exposure
Cutaneous manifestations of drug Abuse

Abnormal vascular response

Erythemas including annular erythemas
Urticaria
Vasculitis

Dermatology and age of man

Ageing of skin
Neonatal dermatological problems
Pediatric and adolescent problems
Geriatric dermatological problems

Skin Lesions in nutritional, heritable and metabolic disorders

Cutaneous Changes in nutritional disorders.
Acrodermatitis enteropathica and zinc deficiency disorders.
Cutaneous Changes in errors of amino acid metabolism

Porphyrias
Xanthomas
Disorders of lipid metabolism and storage
Mucinosis
Amyloidosis
Angiokeratoma corpris diffusum
Lipid proteinosis
Malabsorbtion
Vitamin and mineral deficiency and excess

Skin Manifestations of systemic disorders

Skin and disorders of the alimentary tract
Hepatobiliary system and the skin
Cutaneous changes in renal disorders, cardiovascular, pulmonary
disorders and endocrinal disorders
Skin changes in pregnancy
Cutaneous changes in haematological disease (Langerhans Cells and other cutaneous histiocytosis, Mastocytoses Syndrome)
Cutaneous changes in endocrine disorder
Flushing and carcinoid syndrome.

Genodermatosis

Phacomatosis
Tubero sclerosis
Incontinentia pigmentation
Ectodermal dysplasia
Xeroderma pigmentosis

Connective tissue disorder and Skin manifestations of rheumatological diseases

- Reiter's syndrome.
- Arteritis and venulitis.
- Lupus erythematosus
- Dermatomyositis
- Scleroderma
- MCTD (Mixed connective Tissue Disorders)
- Relapsing polychondritis
- Rheumatoid arthritis, rheumatic fever and gout
- Sjogren.s syndrome
- Raynaud.s phenomenon
- Multicentric reticulohistiocytosis

Cutaneous Manifestations of Disease in Other Organ Systems

Sarcoidosis of the skin
Cutaneous Manifestations of Internal Malignancy
Acanthosis Nigricans
Papular Mucinosis
Neurocutaneous Disease
Tuberous Sclerosis Complex
Neurofibromatosis
Ataxia Telangiectasia
Behect.s Disease

Bacterial infections

Pyodermas : Staphylococcus aureus, Streptococcus, and others
Staphylococcal scalded-skin syndrome
Soft tissue infections : Erysipelas, Cellulitis
Systemic bacterial infections with cutaneous manifestations
Cutaneous tuberculosis and atypical mycobacterial infections
Actinomycetoma

Fungal infections

Superficial fungal infection : (dermatophytosis, yeast, others)
Deep fungal infections

Viral and rickettsial infections

Herpes simplex virus infections
Varicella . zoster infection
Human papilloma virus
Molluscum contagiosum
Hepatitis B, C
Rubella
Measles

Parasitic and protozoal infestations

Scalries
Pediculosis.
Arthropods and skin.

THERAPEUTICS

Topical Therapy

Pharmacokinetics and topical applications of drugs
Principles of topical therapy, topical formulations

Topical Agents
Glucocorticoids, analgesics, anesthetics, antinflammatory, anti microbial, anti parasitic, antiperspirants, antipruritic, antiviral, astringents, bleaching agents, keratolytics and keratoplastic agents.
Therapies, antiviral, topical antibiotics, topical antifungal agents, sunscreens, cytotoxic agents, retinoids, Vit D3 analogues, cosmetics and skin care in practice, emollients and moisturizer.

Systemic Therapy
Systemic glucocorticoids, antibiotics, antileprosy and antituberculous agenst, sulfones, aminoquinolines, cytotoxic and antimetabolic agents, oral retinoids, antihistamines, antiviral drugs, oral antifungal agents, immunosuppressive and immunomodulatory drugs, thalidomide. Antiparasitic drugs, antiandrogens, interferons, biologics, intravenous immunoglobulins, antiplatelet agents, psychotropic agents. other misc. systemic drugs

Dermatosurgery including Cosmetic dermatology
Local aneasthesia and nerve blocks, electrosurgery/ cautery, vitiligo surgeries, cryotherapy, electrolysis, tattooing, intra-lesional injections, iontophoresis, dermabrasion, biopsy techniques, hair and nail minor surgeries, excision surgeries.
Lasers in dermatology - for vascular, hair and pigmented disorders.

Skin resurfacing : chemical peels
Skin resurfacing : dermabrasion
Skin resurfacing : Laser
Skin punch grafting
Wound dressings
Sclerotherapy for varicose and telangiectatic veins
Botulinum injections.
Tumescent liposuction
Substances for soft tissue augmentation
Hair transplantation and alopecia reduction
Cryosurgery
Mohs micrographic surgery
Nail surgery

Photochemotherapy and Photo therapy including principles and use of Narrow band UVB, PUVA, UVB in Skin diseases.

STD
Clinical approach to the patient with STD
Anatomy of male and female genitalia
Epidemiology of STD's
Human Sexuality.
Viral STD.s including HIV, HSV, HPV, Molluscum contagiosum, EBV etc.
Bacterial STD.s : Syphilis, gonorrhoea, chancroid, donovanosis, bacterial vaginosis
Chlamydial and mycoplsma infections : Lymphogranuloma venereum, urethritis, cervicits, NGU
Fungal : Candidiasis
Protozoal : Trichomoniasis
Ectoparasitic : scabies, pediculosis infestations.
Syndromic management of STD.s
STD.s in reproduction health and paediatrics
STD.s and HIV
Post exposure prophylaxis
Prevention, counseling and education of different STD.s including HIV
National control programmes of STDs and HIV infection
Medicolegal, social aspects of STD.s including psychological and behavioural abnormalities in STD patients.

Management of Antiretroviral Therapy of Adults and Adolescents.
- Diagnosis of HIV Infection in Adults and Adolescents.
- Assessment of Adults and Adolescents with HIV Infection and pre- ART Care and Follow-up.
- Prophylaxis of Opportunistic Infections.
- ART in Adults and Adolescents.
- Routine Monitoring of Patients on ART.
- ART in pregnant Women, PPTCT and Previous Exposure to NVP.
- Considerations for Co-infection with HIV.
- Antiretroviral Drug Toxicity.
- ART Treatment Failure and When to Switch.
- Choice of ARV Regimens in the Event of Failure of First-line Regimens.
- Nutritional Aspects of HIV.
- Palliative Care in HIV.
- NACO Standardized Reporting and Recording System.

Management of Occupational Exposure including Post-exposure Prophylaxis.
Cutaneous Manifestation and Lab-diagonasis of HIV.
Prevention aspect of STD's (Condoms, Vaccines etc).
Prevention, counseling and education of different STD.s including HIV
National control programmes of STDs and HIV infection

Medicolegal, social aspects of STD.s including psychological and behavioural abnormalities in STD patients

LEPROSY

Approach to the patient with leprosy
Epidemiological aspects
Structure, biochemistry, microbiology of Mycobacterium leprae
Animal models
Pathogenesis
Classification
Immunology and molecular biological aspects
Histopathology and diagnosis including laboratory aids
Clinical features
Reactions
Systemic involvement (ocular, bone, mucosa, testes and endocrine etc.)
Pregnancy and leprosy
HIV infection and leprosy
Therapeutic aspects including newer drugs
Immunotherapy,
Disabilities, deformities and rehabilitation
Prevention, education and counseling
National leprosy control and elimination programme

DIPLOMA IN VENEREOLOGY AND DERMATOLOGY PRACTICAL/ CLINICAL EXAMINATION :-

Sr. No.	Heads	Marks
1	One Long Case	80
2	Two Short Cases	30×2=60
3	Viva	80
4	Spotters Ten	5×10=50
5	Histopath Slides	3×10=30
Total Marks	**300 Marks**	

Subheads to be added to Draft Syllabus for MD and DDVL

Basics of Dermoscopy and Trichoscopy

Cosmetic Dermatology
Chemical Peels,
Lasers,
Botox and fillers,
Facial rejuvenation

Continuing Medical Education:

1) University should sponsor CMEs to be held by rotation in each of the medical colleges affiliated to the university on the subjects of (or related subjects)
    a. Dermatopathology
    b. Dermoscopy
    c. Skin in internal medicine
    d. Genodermatoses
    e. Autoimmune diseases
    f. Contact Dermatitis
    g. Ultraviolet therapy
    h. Vitiligo
    i. Pigmentary diseases
    j. Leprosy

2) Faculty development:

    a. Faculty training: Each of the medical college departments may be identified as a training centre for one or two subspecialties mentioned above. Faculty from other medical colleges interested in getting trained in that department for that subject should be given the opportunity to attend the training for one to two weeks on deputation from their department under a university program. Faculty may also be encouraged to acquire experience in related fields by attending part time at an allied department in the same hospital.

    b. Foreign Conferences - leave and support: Each senior faculty (Professor and Associate Professor), should be given 5 days leave once a year to attend a conference or training abroad. Financial assistance for such travel may be given if the faculty is invited to present a paper at the conference.

3) Books and journals: Currently students and teachers are unaware of the availability of digital resources provided by MUHS. Awareness drive should be held to improve visibility of this vital resource. Students should be given a handout of the facilities at the time of registration.

    a. The number of books and journals provided in the MUHS digital library should be increased. I recommend the following additional journals:
        Indian Journal of Dermatology
        International Journal of Dermatology
        Indian Journal of Sexually Transmitted Infections and AIDS
        Journal of American Academy of Dermatology
        Journal of European Academy of Dermatology and Venereology

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

Syllabus / Curriculum for

MD (General Medicine)

GOAL

A postgraduate in a general medicine is expected to diagnose and treat common medical illnesses and have a sufficient knowledge of rare diseases, advances and technologies in medicine. He should be able to manage medical emergencies and carry out research and undergraduate medical teaching.

OBJECTIVES: To achieve the goal following objectives must be fulfilled:

A) COGNITIVE DOMAIN:

1. Proper history, examination and diagnosis.
2. Relevant investigations, their interpretation with reasonable accuracy.
3. Appropriate treatment and early disposal.
4. Prompt diagnosis and management of emergencies.
5. Update knowledge
6. Teach and guide undergraduate (MBBS) students.
7. Carry out research and publication.

B) PSYCHOMOTOR DOMAIN:

1. To perform diagnostic/ therapeutic procedures like central venous line insertion, lumbar puncture, pleural/ pericardial/ ascites tapping, bone marrow aspiration, liver/ kidney/ pleural biopsy, and interventions such as mechanical ventilation, tube thoracostomy, cardiopulmonary resuscitation, temporary pacing etc.
2. To be familiar with complication of procedures and be equipped in their management.

C) AFFECTIVE DOMAIN:

1. Ethical principles during work
2. Seek and give consultation when required.
3. Sympathetic behavior with patients and their relatives.
4. Respects patients' rights and privileges.
5. Supplement information about their illness.
6. Consider seeking second opinion when requested by patients.
7. Develop communication skills to interact with colleagues, senior and paramedical staff.
8. To realize that patient management is a team work.

COURSE DESCRIPTION

Duration: 3 years Residency program

SCOPE OF TRAINING

Diseases related to general medicine, relevant radiology techniques, emergency and intensive care management, maintaining records, use of computers and basic research. Patient care in the settings of outdoor, day care, indoor, emergency and intensive/ critical care.

COURSE CONTENTS

I) Knowledge a) Applied basic science knowledge
b) Diseases with reference to General Medicine **(appendix -1)**
c) Recent advances
d) Biostatistics and clinical epidemiology

2) Skills:- a) Decision making
b) Diagnostic investigation and procedures
c) Monitoring seriously ill patients
d) Counseling patients and relatives
e) Ability to teach undergraduate students
f) Ability to carry out research

TEACHING & LEARNING ACTIVITIES

a) Ward/OPD patient management
b) Long and short topic presentations
c) Ward rounds, case presentations and discussions
d) Clinico-radiological and clinico-pathological conferences
e) Journal conferences
f) PG Case presentation clinics
f) Research review
g) In-house and guest lectures
h) Conferences, symposia, seminars and CMEs
i) Participations in workshops, updates, conferences
j) Teaching undergraduates
k) Use and maintenance of biomedical equipments

STRUCTURED TRAINING PROGRAMME

(Broadly conceived):

1) First Year Residency:
   a) Outpatients/inpatients care
   b) Managing medical emergencies
   c) Learning diagnostic/ therapeutic procedures and interventions
   d) Interpreting Reports
   e) Starting Dissertation
   g) Use of computers in medicine

2) Second Year Residency:
   a) Outpatients/inpatients care
   b) Rotation (six months to one year) in existing allied specialities such as Cardiology, Neurology, Endocrinology, Hematology, Nephrology and MICU.
   c) Conducting medical procedures independently.
   d) Continuation of dissertation work.

3) Third Year Residency:-
   a) Out-patients and in-patients care
   b) Independent management of emergencies
   c) Teaching junior Residents / under-graduate students enrolled in the subject
   c) Finalisation and submission of dissertation.

DISSERTATION

- The topic should be assigned to the student by the end of 6th month of enrollment.
- The topic should be communicated to the MUHS through Head of Department and Head of Institution by 7th month of enrollment.
- The duration of the study shall be upto 17 months.
- The last date of submission of the completed dissertation to the MUHS should be six months prior to the date of commencement of the degree examination.

EVALUATIONS

Regular evaluation of the postgraduate will be carried out by assessment of postgraduate activity like case presentation, seminars etc. **(appendix-2)** and evaluation at the end of each clinical posting including superspeciality postings**. (appendix- 3).** The overall performance has to be to the satisfaction of the HOD for recommendation of candidature for MD examinations.

RECOMMENDED READING

Books.-

- Harrison's Principles of Medicine
- Oxford Textbook of Medicine
- Cecil Textbook of Medicine

Reference Books:

- API Text Book of Medicine
- Wintrobe's Hematology
- Kelly's Textbook of Rheumatology
- Patten's Neurology
- Brain's Neurology
- Crofton and Douglas Respiratory Medicine
- Hepatology by Sheila Sherlock
- Electrocardiography by Shamroth
- Braunwauld's Cardiology

Journals:

- Lancet
- British Medical Journal
- Chest
- ICMR Bulletin
- WHO Bulletin
- New England Journal of medicine
- Journal of Association of Physicians of India
- Journal of Postgraduate Medicine
- Annals of Internal Medicine
- APICON Medicine Update
- Medical Clinics of North America
- Indian Practitioner
- Journal of Applied Medicine
- Journal of General Medicine

UNIVERSITY EXAMINATIONS : (*As per Direction No. 01/2008 dtd. 26/05/2008)*

Appendix-1

Diseases in General Medicine

HAEMATOLOGY

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, 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 narrow 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, myxedema, 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/ electro-myography/ 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, opportunistic infections, complications, anti-retroviral therapy, prophylaxis: post exposure and of opportunistic infections, recent advances, historical record.

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, nephrotic 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, pharmaco-therapy 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.

PREGNANCY MEDICINE

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, immuno-modulators, 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, osteo-arthritis.

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, endotrachial 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, hemoptyses, obstructive airways disease, tension pneumothorax, adult respiratory distress syndrome (ARDS), respiratory failure, cor-pulmonale, 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.

Appendix -2

PG - ACTIVITY ASSESSMENT SHEET

Student's Name……. Date……..

PG – CLINIC (Case presentation)

a. History & Examination
b. Investigations
c. Diagnosis & Clinical co-relation
d. Management
e. Questions & Answers

CLINICAL SEMINAR (Case discussion)
a. Case details
b. Discussion (content, update references, etc)

c. Presentation (Clarity, time, language, etc)
d. Audio-visual aides
e. Questions & Answers

SEMINAR (Problem/ syndrome based discussion)
a. Content
b. Update with references
c. Presentation (Clarity, time, language. etc)
d. Audio-visual aides
e. Questions & Answers

Appendix 3

CLINICAL WORK EVALUATION SHEET

For posting under one Unit (including super-specialty postings)
Student's Name ……. Posting period. ……to …….

Points for Assessment:
1. Punctuality and discipline
2. Quality of Ward-work
3. Maintenance of Case-Records
4. Presentation of cases in Rounds
5. Investigation Work-up
6. Bedside manners
7. Rapport with the patients
8. Rapport with Colleagues
9. Undergraduate Teaching (if applicable)
10. Counseling patient's relatives

Name of the Unit head Signature
Dated

TO BE CIRCULATED TO COLLEGES CONDUCTING PG COURSE
CURRICULUM

M. D. HUMAN PHYSILOGY

POST GRADUATE TEACHING / TRAINING COURSE FOR M.D.DEGREE

I. GOAL

The aim of the course is to prepare P.G. Student in the subject of Human Physiology who shall

1) Teach and train future under-graduate & Post-graduate medical students in Human Physiology in Medical Colleges and Research Institutions.

2) Carry out & guide research & contribute to advancement of the subject.

3) Organise & manage administrative responsibilities for routine day to day departmental work.

LEARNING OBJECTIVES

At the end of training course a P.G. student have thorough knowledge of the body with respect to

1) Cognitive domain

All the systems of the body should be studied with respect to –

a) Historical aspect
b) Evolution & development
c) Comparative physiology
d) Structure – gross & electron microscopic & functions at cellular level.
e) Qualitative & quantitive aspects
f) Regulating mechanisms.
g) Variations in physiological & pathological conditions
h) Applied physiology
i) Recent advances.

2) Psychomotor domain
P.G.Students should be able –
a) to perform human & animal experiments, Haematology experiments & experiments based on biophysical principles.
b) To acquire history taking & clinical examination skills.

3) Affective domain

a) The P.G.Students should develop communication skills to interact with students, colleagues, superiors & other staff members.
b) They should be able to work as a member of a team to carry out teaching as well as research activities.
c) They should have right attitude towards teaching profession.

II. COURSE DISCRIPTION

1) Eligibility M.B.B.S.
2) Selection shall be through a competitive written examination of the objective variety conducted by state entrance board.
3) Duration of course shall be of 3 Years.

COURSE CONTENT

Since the students would be working in the department for 3 years, the time plan & proposed division of course content will be on the following lines.

1st Year :

1) Theory :

- To attend the U.G. lectures and study in detail the following topics:

Topics – General physiology, Environmental physiology, Nerve, Muscle, Blood, Endorcrines, Reproduction, Alimentry system.

- To attend P.G. lectures at other P.G.Centres.

2) Practicals –

- To attend the practicals & demonstrations tought by senior teachers for U.G.Students.

1st term – Haematology, Nerve, Muscle, Heart.
2nd term – clinical examination.

- To learn basic techniques & instruments used for U.G. Practicals.
- Micro teaching sessions for practicals.

3) To learn evaluation techniques.

4) Research :

- To attend Jornal club / seminars.
- Vists to library to get aquainted with scientific journals.
- 2nd half of 1st year – review of literature for topic of thesis.

5) Exposure to Medical Education Technology Workshops.

2nd Year :

1) Theory :

- To attend the U.G. lectures and study in detail the following topics.

Topics – Renal physiology Cardio Vascular system.
Respiratory system, Exercise physiology, Special senses, Central Nervous System.

- To attend the P.G. lectures at other P.G.Centres.

2) Practicals :

- To perform amphibian & mammalian experiments, inclusive of basic techniques of handling of laboratory animals, anaesthia, dissection & instruments.

3) To learn in detail the teaching learning methods and the methods of evaluation in practicals & theory.

4) Teaching :

- Small group teaching in practicals / demonstrations.
- Should learn to use audiovisual aids.

5) Research :

- To carryout thesis work & to learn basic topics in statistics.

6) To attend meeting organised by clinical departments.
7) To attend local and national conferences.

3rd Year :

1) Research :

- Completion & submission of thesis in first 6 Months
- Writing articles for publication.

2) Teaching :

- To teach all practicals to U.G. Students.
- To conduct microteaching sessions for 1st year P.G. Students.
- To teach theory topics in small groups for U.G. Students.

3) Practicals :

- To carry animal experiments independently.

THEORY TOPICS :

In Addition to U.G. Syllabus

1) General Physiology :

- Biological membranes with details of membrane receptors.
- Physiology of growth & senescence.

2) Environmental Physiology :

- Physiology of deep sea diving.
- Space physiology
- High altitude physiology.
- Temp. regulation-Hypothermia, Hyperthermia.

3) Nerve :

- Experimental techniques to study bioelectrical phenomena (Voltage clamp technique, cathod ray oscilloscope, S.D.Curve, nerve, conduction studies)

4) Muscle :

- E. M. G. details.
- Smooth muscle.
- Pathophysiology of muscle disorders.

5) Blood :

- Immunity – details.
- Plasmin system
- Tissue typing.

6) Cardio Vascular System :

- Echocardigraphy & vector cardiography.
- Stress test.
- Cardiac catheterisation & other invasive procedures.
- Flowmeters.

7) Repiratory sustem :

- Lung function tests – details
- Blood Gas analysis.
- Hyperberic oxygen.

8) Endocrines :

- Radio immuno Eassay.

9) Reproductive System :

- Invitro Fertilization.
- Contraceptives – details
- Neonatal & Foetal physiology.

10) Alimentary System :

- Gastro intestinal hormones – details
- Gastro intestinal motility – details
- Absorption of nutrients.
- Renal Physiology :

- Artificial Kidney
- Acid – base balance – details
- Cystometry.

11) Central Nervous System :

- Higher function

(Speech, Memmory, Learning, Behavioural physiology, sleep & wakefulness.)

- Voluntary movements.
- Details of the following topics covering physiological anatomy, connection – Intrinsic, Extrinsic, Methods of study of functions with diagnostic techniques, functions.

i) Cerebral Cortex
ii) Basal ganglia
iii) Cerebellum
iv) Reticular formation.
v) Thalamus
vi) Hypothalamus
vii) A.N.S.
viii) Limbic System.

12) Special Senses :

- Audiometry
- Retinoscopy, Fundoscopy, Nystagmography
- Electrophysiology of retina, chochlea.

13) Exercise Physiology :

- Concept of health fitness
- Physical fitness, its components & evaluation.
- Adaptations due to prolonged conditioning.

14) Nutrition :

- Relationship of diet & diseases.

PRACTICALS :

In Addition to U.G. Syllabus

Mammalian experiments :

1) Recording of blood pressure & respiration in dog.

- Effects of Vagal stimulation and ablation.
- Effects of Asphyxia
- Actions of Adrenalin
- Actions of Acetylcholine
- Clamping of carotid arteries
- Circulatiory shock.

2) Perfusion of mammalian heart.

- Effects of Various factors.

3) Recording of smooth muscle activities & effects of various factors.

II. TEACHING LEARNING METHODS :

The teaching learning activities would consists of

1) Attending U.G. lectures.
2) Attending P.G. lectures.
3) Microteaching sessions.
4) Journal clubs moderated by teachers.
5) Seminars, symposia, panel discussion of suitable topics moderated by teachers.
6) Lectures & Practicals prepared & presented by students under supervision.
7) Attend & participate in conferences, workshops & share knowledge & experiences with others.
8) Visits to various clinical departments to gain the knowledge of various techniques used to study the functions of various systems.

Recommended reading :

Textbooks of physiology –

- Guyton
- Best & Taylor
- S. Wright
- Ganong
- Berne & Levy
- NMS Physiology
- Starling
- Monographs.

Journals –

- Annual review of physiology
- American J. of Phy.
- Physiological review
- Canadian J. of Phy. & Pharamcology
- Indian J. of Phy. & Pharm. & other related clinical Journals.

IV EVALUATION : (***As per Direction No. 01/2008 dtd. 26/05/2008 & practical scheme is as per revised practical marksheet.)***

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

CURRICULUM
POSTGRATUATE MEDICAL EDUCATION
IN
MICROBIOLOGY

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES,NASHIK

DRAFT CURRICULUM FOR POSTGRADUATE COURSE

M.D. (MICROBIOLOGY)

The aim of this course is to train the students of Medicine in the field of Medical Diagnostic Microbiology. Knowledge and practical skills shall be acquired by the candidates in the sub-specialities of Bacteriology including Mycobacteriology, Virology, Parasitology, Immunology, Serology & Mycology so as to be able to deal with diagnosis and prevention of infectious diseases in the community. They will be trained in basic research methodology including molecular biology so that they are able to conduct fundamental and applied research. They will also be trained in teaching methods so that they can take up teaching assignments.

GOAL:

The goal of the postgraduate medical education shall be to produce a competent specialist and Medical teacher:

- Who shall recognize the health needs of the community and 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 Medical diagnostic Microbiology 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 field of medical and diagnostic Microbiology
- Who shall have acquired the spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology
- Who shall have acquired the basic skills of teaching of the medical and paramedical professionals.

EDUCATIONAL OBJECTIVES:

KNOWLEDGE:

At the end of the course the students shall be able to:

1.State and explain the clinical features, etiology, pathogenesis and methods of laboratory diagnosis of infectious diseases and apply that knowledge in the treatment, prevention and control of communicable diseases caused by micro-organisms.

2.State and explain the principles of immunity and immunological phenomenon which help to understand the pathogenesis, laboratory diagnosis of infectious and non-infectious diseases.

3. Establish and practice “laboratory medicine” for diagnosis of infectious diseases in hospitals and community in the field of bacteriology, parasitology, virology, mycology, serology and immunology in the light of clinical findings.

4. Organize the prevention and control of communicable diseases in the community.

5. Understand and practice the principle of prevention and control of health

care associated infections and rational antibiotic policy.

6. State the recent advances in the field of Medical Microbiology and apply this knowledge in understanding aetiopathogenesis and diagnosis of diseases caused by micro-organisms.

7. Carry out fundamental or applied research in the branches of medicine involving microbiological work.

8. Develop specialization in any of the above subspecialities.

9. Undertake teaching assignments in the subject of medical Microbiology.

(B) Skills

At the end of the course the student shall be able to

1. Plan the laboratory investigations for the diagnosis of infectious diseases

2. Perform laboratory procedures to arrive at the etiological diagnosis of infectious diseases caused by bacteria, fungi, viruses and parasites including the drug sensitivity profile.

3. Perform and interpret immunological and serological tests.

4. Operate routine and sophisticated instruments in the laboratory.

5. Develop microteaching skills and Pedagogy

6. Successfully implement the chosen research methodology

COURSE CONTENT (SYLLABUS)

DURATION OF COURSE:

The minimum period of training shall be three calendar years and the candidates can be admitted to this training after their full registration with the Medical Council. No exemption shall be given from this period of training of three years either for doing housemanship or for any other experience or diploma.

TRAINING PROGRAM:

The candidates joining the course must work as full time residents during the whole period of their postgraduate training. They will be required to attend a minimum of 80% of training period. Candidate shall be given full time responsibility and assignments and their participation in all facets of the educational process assured.

Postgraduate students must maintain a record book of the work carried out by them and the training undergone by them during the period of training. These record books shall be checked and assessed by the faculty.

TEACHING /LEARNING METHODS:

Learning in M. D. (Microbiology) will essentially be self-learning.

Following teaching-learning methods shall be followed-

Group teaching sessions:

- Journal review
- Subject seminar presentation
- Group discussion
- Slides seminars
- Clinical case presentations pertaining to infectious diseases
- Presentation of the findings of an exercise on any of the sub-specialities
- Participation in CME programs and conferences

Hands on experience (practical training)

Practical training shall be imparted by posting the students in various sub-specialities (sections) as detailed in the intrinsic and extrinsic rotation.

Student shall be actively involved in day to day working of all the sections. He/she will be trained under the guidance of teachers in all the aspects of Clinical Microbiology and applied aspects of laboratory medicine including collection and transport of specimens, receiving of samples, preparation of requisite reagents, chemicals, media and glassware, processing of specimens, performing required antimicrobial susceptibility testing and reporting on the specimens, interpretation of results, sterilization procedures, bio-safety precautions, infection control practices, maintenance of equipments, record keeping and quality control in Microbiology.

Suggested schedule of rotation:

Intrinsic rotation:

1.	Bacteriology(Aerobic and anaerobic)	6 months
2.	Mycobacteriology	3 months
3.	Hospital infection surveillance	3 months
4.	Serology/Immunology	6 months
5.	Mycology	3 months
6.	Virology/HIV	3 months
7.	Parasitology	3 months
8.	Clinical Microbiology(OPD)	2 months
9.	Molecular Diagnostics	1 month

Extrinsic rotation:

Clinical Pathology		3 months
*Elective posting		3 months
	Total	36 months

Emergency duty:

Student shall be posted for managing emergency laboratory services in Microbiology. He/she will deal with all the emergency investigations in Microbiology.

Training in research methodology:

Training in research methodology shall be imparted by planning of a research project by the student under the guidance of a recognized guide to be executed and submitted in the form of a dissertation.

The dissertation is aimed at training the candidate in research methods and techniques. It will include identification of a research question, formulation of a hypothesis, search and review of relevant literature, getting acquainted with recent advances, designing of research study, collection of data, critical analysis of the results and drawing conclusions.

The topic shall be communicated to the university within six months of registration and at least 12 months should be spent on the research project.

The dissertation shall be completed and submitted by the student six months before appearing for the final university examination.

Teaching experience:

Student shall be actively involved in the teaching of undergraduate students. He/she will be trained in teaching methods and use of audiovisual aids.

BROAD AREAS OF STUDY

General Microbiology; Systematic Bacteriology, Mycology, Virology, Parasitology; Serology,Immunology, molecular diagnostics and Applied Clinical Microbiology including recent advances in Microbiology.

GENERAL MICROBIOLOGY

1. History and pioneers in Microbiology
2. Microscopy
3. Morphology of bacteria and other micro-organisms.
4. Nomenclature and classification of microbes.
5. Growth and nutrition of bacteria.
6. Bacterial metabolism.
7. Sterilization and disinfection.
8. Biomedical waste disposal
9. Bacterial toxins.
10. Bacterial antagonism: Bacteriocins.
11. Bacterial genetics, gene cloning.
12. Antibacterial substances used in treatment of infections and drug resistance in bacteria.
13. Bacterial ecology-normal flora of human body, hospital environment, air, water and milk
14. Host parasite relationship.
15. Quality control and Quality Assurance in Microbiology.
16. Laboratory Biosafety
17. Health care associated infections- prevention and control

IMMUNOLOGY AND APPLIED ASPECTS

1. The normal immune system.
2. Innate immunity.
3. Antigens.
4. Immunoglobulins.

5. Complement.
6. Antigen and antibody reactions.
7. Hypersensitivity.
8. Cell medidated immunity.
9. Immunodeficiency.
10. Autoimmunity.
11. Immune tolerance.
12. Transplantation immunity.
13. Tumour immunity.
14. Prophylaxis and immunotherapy
15. Measurement of immunity.
16. Immunity and immunopathogenesis of specific infectious diseases
17. Molecular Biology Techniques. For e.g. PCR, DNA probes.

SYSTEMATIC BACTERIOLOGY

1. Isolation, description and identification of bacteria. The epidemiology, pathogenesis, antigenic characteristics and laboratory diagnosis of disease caused by them
2. Staphylococcus and Micrococcus; Anaerobic Gram positive cocci.
3. Streptococcus and Lactobacillus.
4. Neisseria, Branhamnella and Moraxella.
5. Corynebacterium and other coryneform organisms.
6. Bacillus: the aerobic spore-bearing bacilli.
7. Clostridium: the spore-bearing anaerobic bacilli.
8. Non-sporing anaerobes
9. The Enterobacteriaceae.
10. Vibrios, Aeromonas, Plasiomonas, Campylobacter and Spirillum,H.pylori
11. Erysipelothrix and Listeria
12. Pseudomonas.
13. Chromobacterium, Flavobacterium, Acinetobacter and Alkaligens.
14. Pasteurella, Francisella.
15. Haemophilus and Bordetella.
16. Brucella.
17. Mycobacteria.
18. The spirochaetes.
19. Actinomyces, Nocardia and Actinobacillus.
20. Mycoplasmatales: Mycoplasma, Ureaplasma and Acholeplasma.
21. Rickettsiae.
22. Chlamydiae.
23. Emerging bacterial pathogens.

VIROLOGY

1. The nature of viruses
2. Classification of viruses
3. Morphology :virus structure
4. Virus replication
5. The genetics of viruses
6. The pathogenicity of viruses
7. Epidemiology of viral infections
8. Vaccines and antiviral drugs
9. Bacteriophages
10. Pox viruses
11. Herpes viruses
12. Vesicular viruses
13. Togaviridae

14. Bunyaviridae
15. Arenaviridae
16. Marburg and Ebola viruses
17. Rubella virus
18. Orbi viruses
19. Influenza virus
20. Respiratory disease: Rhinoviruses, adenoviruses, corona viruses
21. Paramyxoviridae
22. Enteroviruses : Polio, Echo, Coxsackie viruses
23. Other enteric viruses
24. Hepatitis viruses
25. Rabies virus
26. Slow viruses
27. Human immunodeficiency viruses
28. Oncogenic viruses
29. Teratogenic viruses
30. Viruses of gastroenteritis
31. Prion diseases
32. Emerging viral infections – SARS, Avian influenza

PARASITOLOGY

1.Protozoan parasites of medical importance : Entamoeba, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Sarcocystis, Cryptosporidium, Balantidium,Isospora, Cyclospora,Microsporidium etc.

2. Helminthology : All those medically important helminths belonging to Cestoda, Trematoda and Nematoda.

Cestodes : Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dypyllidium, Multiceps etc.

Trematodes : Schistosomes, Fasciola, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.

Nematodes : Trichuris, Trichinella, Strongyloides, Ancylostoma, Nicator, Ascaris, Toxocara, Enterobius, Filarial worms, Dracunculus, etc.

3. Ectoparasites : Common arthropods and other vectors viz.,Mosquito, Sandfly, Ticks, Mite, Cyclops.

MYCOLOGY

1. The morphology and reproduction of fungi and antimycotic agents
2. Classification of fungi
3. Contaminant and opportunistic fungi
4. Fungi causing superficial mycoses
5. Fungi causing subcutaneous mycoses
6. Fungi causing systemic infections
7. Antifungal agents

APPLIED CLINICAL MICROBIOLOGY

1. Epidemiology of infectious diseases
2. Hospital acquired infections
3. Infections of various organs and systems of the human body
4. Molecular genetics as applicable to Microbiology
5. Automation in Microbiology
6. Rapid diagnostic techniques for microbial diseases.
7. Vaccinology : principle, methods of preparation, administration of vaccines
8. Outbreak investigations & disaster management
9. Biological warfare

PRACTICALS (SKILLS)

BACTERIOLOGY

Must acquire:

1. Care and operation of Microscopes viz. Light, Dark ground, Phase contrast, Inverted, Fluorescent microscopes.
2. Preparation of stains viz. Gram's, Albert's, Ziehl- Neelson and other special stains - performing of staining and interpretation of stained smears.
3. Washing and sterilization of glassware including plugging and packing.
4. Operation of incubator, autoclave, hot air oven, inspissator, distillation plant, filters like Seitz and membrane and sterility tests.
5. Care and maintainance of common laboratory equipments like water bath, centrifuge, refrigerators, incubators etc.
6. Preparation and pouring of liquid and solid media - Nutrient agar, Blood agar, MacConkey agar, sugars, TSI agar, Robertson's cooked meat, Lowenstiein- Jensen's, selective media.
7. Preparation of reagents – oxidase, Kovac, etc.
8. Tests for beta-lactamases including ESBLs.
9. Collection of specimens for Microbiological investigations such as blood, urine, throat swab, rectal swab, stool, pus, OT specimens.
10. Preparation, examination and interpretation of direct smears from clinical specimens,viz. Sputum for AFB – ZN & auramine O, slit smears for *M..leprae,-*ZN stain, conjunctival smear for Chlamydiae – Giemsa/Iodine.
11. Techniques of anaerobiosis – Gaspack system,anaerobic jars-evacuation & filling with H_2, CO_2
12. Identification of bacteria of medical importance upto species level (except anaerobes – upto generic level)
13. Quantitative analysis of urine by pour plate method and semiquantitative analysis by standard loop test for significant bacteriuria.
14. Plating of clinical specimens on media for isolation, purification identification and quantitation.
15. Tests for motility: hanging drop, Craige's tube, dark ground microscopy for Spirochaetes – Treponema & Leptospira.
16. In-vitro toxigenicity tests – Elek test, Nagler's reaction
17. Special tests – Bile solubility, chick cell agglutination, sheep cell haemolysis, niacin and catalase tests for mycobacterium, satellitism, CAMP test, catalase test and slide agglutination tests, and other as applicable t identification of bacteria upto species level
18. Preparation of antibiotic discs; performance of antimicrobial susceptibility testing by Kirby-Bauer disk diffusion method; estimation of Minimum

inhibitory /Bactericidal concentrations by tube/plate dilution methods. Tests for drug susceptibility of Mycobacterium tuberculosis
19. Skin tests like Mantoux, Lepromin etc.
20. Testing of disinfectants- Phenol coefficient and 'in use' tests.
21. Quality control of media reagents etc. and validation of sterilization procedures.
22. Aseptic practices in laboratory and safety precautions.
23. Disposal of contaminated material like cultures.
24. Bacteriology of food, water, milk, air
25. Maintenance of stock cultures.

Desirable to acquire:

1. Care and breeding of laboratory animals viz. Mice, rats, guinea pigs and rabbits.
2. Techniques of withdrawal of blood from laboratory animals includingsheep.
3. Inoculation of infective material in animals by different routes.
4. Animal pathogenicity /toxigenicity tests for *C.diphtheriae, Cl.tetani, S. pneumoniae, S.typhimurium, K. pnumoniae etc.*
5. Performance of autopsy on animals.
6. Isolation of plasmids and Conjugation experiments for transfer of drug resistance
7. Serum antibiotic assays eg. Gentamicin
8. Phage typing for staphylococci, *S.typhi etc.*
9. Bacteriocine typing eg. Pyocine, Proteocin etc.
10. Enterotoxigenicity tests like rabbit ileal loop, intragastric inoculation of mouse, Sereny's test.
11. Mouse foot pad test for *M.leprae*

IMMUNOLOGY/ SEROLOGY

1. Collection of blood by venepuncture, seperation of serum and preservation of serum for short and long periods.
2. Preparation of antigens from bacteria or tissues for widal, Weil-Felix, VDRL, etc. and their standardisation.
3. Preparation of adjuvants like Freund's adjuvant.
4. Raising of antisera in laboratory animals.
5. Performance of serological tests viz. Widal, Brucella tube agglutination, indirect haemagglutination, VDRL, Paul-Bunnel, Rose-Waaler, IFA.
6. Immunodiffusion in gels, counter immunoelectrophoresis- visualization and interpretation of bands.
7. Performance and interpretation of Enzyme linked immunosorbant assay.
8. Latex and staphylococcal co-agglutination tests.

Desirable to acquire:
1. Leucocyte migration inhibition test.
2. T-cell rosetting.
3. Flow Cytometry
4. Radial immunodiffusion.
5. Immunoelectrophoresis.
6. Neutrophil phagocytosis.

MYCOLOGY

Must acquire:

1. Collection of specimens for mycology.
2. Direct examination of specimens by KOH, Gram, Kinyoun's, Giemsa, Lactophenol cotton blue stains.
3. Examination of histopathology slides for fungal infections.
4. Isolation and identification of pathogenic yeasts and moulds and recognition of common laboratory contaminants.
5. Special techniques like Wood's lamp examination, hair baiting, hair perforation, paraffin baiting and slide culture.
6. Maintenance of stock cultures.
7. Animal pathogenecity tests viz. Intracerebral and intraperitoneal inoculation of mice for cryptococcus.

PARASITOLOGY

Must acquire:

1. Examination of faeces for parasitic ova and cysts etc. by direct and concentration methods (salt floatation and formol – ether methods)and complete examination for other cellular features.
2. Egg counting techniques for helminths.
3. Examination of blood for protozoa and helminths by wet mount, thin and thick stained smears.
4. Examination of other specimens for e.g. urine, C.S.F., bone marrow etc. for parasites.
5. Histopathology sections – examination and identification of parasites.
6. Performance of stains – Leishman, Giemsa, Modified Acid Fast, Toluidine Blue O.
7. Identification of common arthropods and other vectors viz. Mosquito, sand fly, ticks, mite and cyclops.
8. Collection of specimens.
9. Preservation of parasites – mounting, fixing, staining etc.

Desirable to acquire:

1. In-vitro culture of parasites like entamoeba, leishmania, P.falciparum.
2. Maintainance of toxoplasma gondii in mice.
3. Preparation of media – NIH, NNN etc.
4. Copro-culture for larva of hook worms.
5. Antigen preparation viz. Entamoeba , Filarial , Hydatid for serological tests like IHA and skin test like Casoni's .
6. Permanent staining techniques like iron haematoxylin

VIROLOGY

Must acquire:

1. Preparation of glassware for tissue culture(washing, sterilization)
2. Preparation of media like Hanks, MEM.
3. Preparation of clinical specimens for isolation of viruses.
4. Serological tests-ELISA and rapid tests for HIV, RPHA for HbsAg, Haemagglutination inhibition for influenza, AGD and

couterimmunoelectrophoresis for detection of viral antigens or antiviral antibodies.
5. Chick embryo techniques- inoculation and harvesting.
6. Handling of mice, rats, guinea pigs, rabbits for collection of blood, pathogenicity test etc.

Desirable to acquire:

1. Preparation of Monkey Kidney Cells (Primary) maintenance of continuous cell lines by subcutures. Preservation of cell cultures.
2. Recognition of CPE in tissue cultures.
3. Performance of haemadsorption, haemagglutination, immunofluorescence, neutralization tests for identification of viruses.

SUGGESTED READING:
BOOKS:

Reference books (Please refer the most recent edition)

1. Topley and Wilson's Microbiology and Microbial infections. 8 volumes 2005, 10th edition
2. Color Atlas and Textbook of Diagnostic Microbiology: Elmer W Koneman -2006, 6th edition
3. Mandell, Douglas and Bennett's Principles and Practice of Infectious Diseases -2004, 6th edition
4. Microbiology and Clinical Practice: Shanson-1999, 3rd edition
5. Immunology: Janis Kuby- 2003.
6. Basic Clinical Immunology.
   Fudenburg, Stites, Caldwell, Weils.
7. Control of Hospital Infection- A practical handbook (most recent edition)-2000, 4th edition
8. Bailey and Scott's Diagnostic Microbiology.
9. Text book of Parasitology.
   Chatterjee K.D.
10. Microbiology in Clinical Practice.
    Shanson D.C.
11. Beaver's Parasitology Textbook

Further Reading

1. Mycology - Rippons
2. Essentials of Immunology- Roitt
3. Virology- Clinical Virology by Rich
4. Gradwohl's Clinical Laboratory Methods and Diagnosis.
5. Biochemical tests for the Identification of Medical Bacteria- MacFaddin JF
6. Manual of Clinical Microbiology- ASM press

Journals

1. Indian Journal of Medical Microbiology
2. Clinical Microbiology Reviews
3. Journal of Clinical Microbiology
4. Journal of Medical Microbiology
5. Journal of AIDS
6. Journal of Hospital Infection
7. Indian Journal of Tuberculosis and Lung Diseases.

8. Indian Journal of Medical Research
9. JAAC
10. Parasitology Today
11. Journal of Infection
12. Infection Control and Hospital Epidemiology
13. Indian Journal of Tuberculosis
14. Journal of Associations of Physicians of India
15. Lancet-Infectious Diseases
16. Emerging Infectious Diseases-online
17. New England Journal of Medicine- online
18. British Medical Journal
19. Scandinavian Journal of Infectious Diseases
20. ICMR Bulletin
21. AIDS Research & Review
22. MMWR
23. Tubercle
24. WHO Bulletin
25. Journal of American Medical Association
26. Paediatric infectious diseases
27. Indian Journal of Leprosy
28. International Journal of Leprosy
29. Immunology
30. American journal of Epidemiology

Important Websites:

1. Center for Disease Control -**www.cdc.gov**
2. World Health Organization- **www.who.int**
3. Infectious Disease Society of America- **www.idsociety.org**
4. United Nations Program on HIV/ AIDS- **www.unaids.org**
5. Johns Hopkins Infectious Diseases- **www.hopkins-id.edu**
6. National Library of medicine- **www.pubmed.com**
7. MD Consult- **www.mdconsult.com**
8. Global Infectious Disease epidemiology network- **www.gideononline.com**
9. National AIDS Control Organization**- www.nacoindia.org**
10. Tuberculosis Research Centre- **www.trc-chennai.org**

EVALUATION :
(As per Direction No. 01/2008 dtd. 26/05/2008)

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

STUDENT'S RECORD BOOK

POSTGRADUATE DEGREE COURSE
M.D. (MICROBIOLOGY)
DEPARTMENT OF MICROBIOLOGY

STUDENT'S RECORD BOOK

Students undergoing postgraduate training in M.D. (Microbiology) are required to maintain a record of their academic and service activities to provide an account of progress made by them.

Residents are required to carry the record book and get the entries made regularly. Faculty is responsible for countersigning the entries made by the student. The record book has to be submitted to the Head of the Department at the end of the course. The internal assessment is partly calculated on the basis of progress made by the student during his tenure in the department as detailed in the syllabus.

The aim of this course is to train the students of Medicine in the field of Medical and Diagnostic Microbiology including molecular diagnostics . Knowledge and practical skills shall be acquired by the candidates in the sub-specialities of Bacteriology including Mycobacteriology, Virology, Parasitology, Immunology, Serology & Mycology so as to be able to deal with diagnosis and prevention of infectious diseases in the community. They are trained in basic research methodology so that they are able to conduct fundamental and applied research. They are also trained in teaching methods so that they can take up teaching assignments.

GOAL :

The goal of the postgraduate medical education shall be to produce a competent specialist and Medical teacher:

- Who shall recognize the health needs of the community and 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 Medical and Diagnostic Microbiology 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 field of Medical and Diagnostic Microbiology
- Who shall have acquired the spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology
- Who shall have acquired the basic skills of teaching of the medical and paramedical professionals.

EDUCATIONAL OBJECTIVES :

KNOWLEDGE :

At the end of the course the students shall be able to

1. State the etiology pathogenesis and methods of laboratory diagnosis and apply that knowledge in the treatment, prevention and control of communicable diseases caused by micro-organisms.
2. State the principles of immunity and immunological phenomenon which help to understand the pathogenesis, laboratory diagnosis of infectious and non-infectious diseases.
3. Establish and practice "laboratory medicine" for diagnosis of infectious diseases in hospitals and community in the field of bacteriology, parasitology, virology, mycology and immunology.
4. Organise the prevention and control of communicable diseases in the community.
5. State the recent advances in the field of Medical Microbiology and apply this knowledge in understanding aetiopathogenesis and diagnosis of diseases caused by micro-organisms.
6. Carry out fundamental or applied research in the branches of medicine involving microbiological work.
7. Develop specialization in any of the above subspecialities.
8. Undertake teaching assignments in the subject of Microbiology.

(B) Skills

At the end of the course the student shall be able to

1. Plan the laboratory investigations for diagnosis of infectious diseases
2. Perform laboratory procedures to arrive at the etiological diagnosis of diseases caused by bacteria, fungi, viruses and parasites.
3. Perform and interpret immunological and serological tests
4. Operate routine and sophisticated instruments in the laboratory.

PASSPORT

SIZE
PHOTOGRAPH

PERSONAL BIO-DATA

FULL NAME OF STUDENT ----------

DATE OF JOINING ----------

DATE OF BIRTH ----------

PERMANENT ADDRESS ----------

TEL.NO. (O)---------- (R) ---------- **MOBILE ---------- PAGER -------**

LOCAL/GUARDIAN ADDRESS ----------

CAMPUS ADDRESS **HOSTEL ROOM NO.----------**

BLOOD GROUP ----------

EDUCATIONAL QUALIFICATIONS

SN.	Degree	Institution/University	Year of passing	Awards/Distinctions

SERVICE RECORD

SN.	Position	Name of Hospital/Institute	From	To	Remarks

POSTING SCHEDULE

MONTH	YEAR AND SIGNATURE OF FACULTY							
	YEAR	SIGN.	YEAR	SIGN.	YEAR	SIGN.	YEAR	SIGN.
JANUARY								
FEBRUARY								
MARCH								
APRIL								
MAY								
JUNE								
JULY								
AUGUST								
SEPTEMBER								
OCTOBER								
NOVEMBER								
DECEMBER								

THESIS/DISSERTATION

Name of the Student :

Topic of Thesis :

Guide :

Co-guide/s:

Protocol presented on:

Progress of Thesis:

Semester	Work done	Sign. Of Guide
1st		
2nd		
3rd		
4th		
5th		

Thesis Presented on :

Thesis submitted on :

SCIENTIFIC CONTRIBUTIONS

Name of the Student:

CME/Workshops attended:

SN	Name of CME/Workshop	Venue	Date	Sign. Of Faculty

Conferences attended:

SN	Name of conf. & Venue	Paper Presented Yes/No	If yes, Title of Paper

Publications:

Awards:

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

Department of Pediatrics

Curriculum

For

Post-graduate Degree Course
M.D. (Pediatric Medicine)

Index

1. Goal

The Goal of M.D. (Pediatrics) Program is to provide training in Pediatrics and Neonatology to produce competent specialists who are able to provide basic and speciality care of the highest order to neonates, infants, children and adolescents at the community level and at primary, secondary and tertiary levels of health care, and to act as future trainers, teachers, and researchers in the field of Pediatrics and Neonatology.

2. Course Description

MD (Pediatrics)

Duration: 3 years

Eligibility: MBBS

3. Intramural and Extramural Rotation

MD (Pediatrics):

- At least 4 and not more that 8 months in Neonatology.
- At least 3 and not more than 6 months in sub-speciality areas: Intensive Pediatric Care Unit (IPCU), Genetic Clinic, Thalassemia Care Centre, Emergency Pediatric Services.
- At least nil and maximum 6 months in Allied areas: Hematology, Infectious Diseases, Dermatology, Cardiology, Nephrology, Chest Medicine, Gastroenterology.

The Department of Pediatrics will decide the posting of students in Neonatology and Allied Branches and Sub- speciality areas.

4. Syllabus

I) Basic Sciences and Laboratory Medicine as applied to Pediatrics and Childhood Diseases.

II) Clinical Epidemiology

III) Ethics in Pediatrics and Child Care

IV) Computers in Pediatrics

V) Pediatric and Neonatal Therapeutics

- Effects of physical and physiological changes on the pharmacokinetics of commonly used medications in Pediatrics.
- Recognition of drugs that are contraindicated, and used with extreme caution in specific pediatric populations.
- Effects of maternal therapy on the fetus and the neonate.
- Secretion of drugs in the breast-milk.
- Patient education and parent education for appropriate drug dosing, formulations and administration techniques.

VI) Preventive Pediatrics

- National Health programs relevant to Pediatrics and Child Care.
- Epidemiology of common health problems and diseases.
- Vital statistics: Maternal Mortality Rate, Perinatal Mortality Rate, Neonatal Mortality Rate, Under-5 mortality Rate: Definitions, National Status, Determinants, Interventions aimed at reduction of the rates.
- National Immunization Programs and policies.
- Other vaccines not included in national immunization program.

VII) Social Pediatrics

- Child labour, Child abuse, Child neglect, Failure to thrive, Social issues relevant to Pediatrics.
- Media and children
- Children at special risk
- Adoption
- Environmental health hazards.

VIII) Psychological Behavioral manifestations disorders

- Identification and assessment of Psychological and behavioral disorders.
- Intervention and management strategies for Psychological and behavioral disorders.

IX) Growth and Development

- Normal pattern and factors affecting growth and development. Recognition of normal variants of growth and development.
- Developmental assessment in infancy and childhood.
- Physiological changes during adolescence and problems facing adolescents.
- Assessment of growth.
- Deviations from normal patterns of growth and development: Recognition, Prevention, Early intervention and Management.
- Tools for assessment of growth and development at various ages including Indian adaptations.

X) Nutrition

- Understanding of energy balance in humans.
- Basic biochemistry of proteins, carbohydrates and fats.
- Proximate Principles, Vitamins, Minerals and Micronutrients: Biochemistry, Physiological Functions, Daily Requirements, Manifestations and Management of deficiency and excess states.
- Normal requirement of protein, fat, carbohydrate for newborns, children, adolescents and pregnant and lactating women.
- Nutritional values of common Indian foods.
- Breastfeeding and lactation management
- Infant feeding and weaning foods.
- Balanced diet.
- Assessment of nutritional status.
- Nutritional disorders-Etiology, Clinical features, patho-physiology, pathogenesis and management
- Pathological features of various nutritional disorders.
- Planning of diet during illness.
- Total parental nutrition.

XI) Fluids and Electrolytes

Pathophysiology of body fluids, fluid therapy, electrolytes, acid-base balance, parenteral and enteral fluid therapy

XII) Emergency pediatric services

- Pediatric resuscitation
- Evaluation of critically ill child.
- Pediatric Emergencies and poisoning.
- Pediatric injuries and injury control and accidents.
- Insect, animal and snakebites.
- Planning and management of pediatric intensive care unit
- Anesthesia, perioperative care and pain management.
- Principles of drug therapy.

XIII) Genetics

- Principles and molecular basis of genetic disorders.
- Clinical features and management of genetic and chromosomal disorders.
- Prenatal diagnostic techniques and neonatal screening tests.
- Effects of teratogenic agents.
- Genetic counseling.
- Gene therapy.

XIV) Metabolic diseases

Metabolic diseases of protein (amino acids), carbohydrates, fats, mucopolysaccharides, purines, pyrimidines, heme and others

XV) Neonatology: The fetus and neonatal infant

- High-risk pregnancy
- Assessment of fetal growth, wellbeing and maturity.
- Fetal distress: Manifestation, identification and management
- Maternal diseases and their effects on the fetus and newborn.
- Assessment of fetal wellbeing.
- Identification and management of various fetal diseases.
- High-risk infant – identification and management.

- Delivery room emergencies, resuscitation of newborn and care of normal new born.
- Birth injuries.
- Adaptation of newborn.
- Examination of newborn and assessment of maturity.
- Etiology, clinical features, pathophysiology, pathogenesis and management of various diseases of newborn.
- Neonatal transport.
- Neonatal procedures.
- Developmental assessment, and early intervention programmes for infants at high risk for developmental delay.
- Care of newborn in the community.
- Planning and organization of level I, level II, Level III Neonatal care centers.

XVI) Infectious diseases

- Clinical features, management of viral, bacterial, fungal, spirochetal, rickettsial, parasitic, protozoal and other infections.
- Prevention and management of nosocomial infections.
- Infection control and preventive measures.
- Immunization against infections diseases.
- Fever
- Laboratory techniques for diagnosis of infections diseases.
- Infections in immunocompromized host.
- Clinical syndromes caused by various infections agents.

XVII) Immunological system and its disorders

- Components of immune system and their functions.
- Disorders of immune system – Etiology, Clinical features, pathophysiology, pathogenesis and management.
- Pharmacotherapy.
- Transplantation medicine.
- Allergic diseases – etiology, clinical features, patho-physiology, pathogenesis and management.
- Relevant diagnostic and therapeutic modalities in various immunological and allergic disorders.

XVIII) Rheumatic diseases and connective tissue disorder of childhood.

Etiology, pathogenesis, manifestation, laboratory diagnosis and management of Rheumatic diseases in childhood and adolescents

XIX) Respiratory system

- Development of respiratory system, congenital anomalies.
- Physiology of respiration and mechanics of ventilation.
- Etiology, clinical features, pathophysiology, pathogenesis and management of various respiratory diseases.
- Pathological features of various respiratory diseases.
- Relevant diagnostic and therapeutic modalities in respiratory diseases in children.
- Pharmacotherapy of respiratory diseases.

XX) Cardiovascular system

- Embryology of heart and vascular system.
- Adaptations of cardiovascular system at and after birth.
- Etiology, pathophysiology, pathogenesis, clinical features and management of congenital and acquired heart and vascular diseases and rheumatic heart disease.
- Rheumatic fever – Epidemiology, clinical features, pathophysiology, pathogenesis, prevention and management.
- Relevant diagnostic and therapeutic modalities in heart diseases in children.
- Congestive cardiac failure – Etiology, pathophysiology, pathogenesis, clinical features and management.
- Pharmacotherapy of cardiovascular diseases.

XXI) Gastrointestinal tract

- Development of gastrointestinal tract, hepatobiliary system and their abnormalities.
- Physiology of digestion.
- Etiology, pathophysiology, pathogenesis, clinical features and management of various gastrointestinal and hepatobiliary and other abdominal diseases.
- Pathological features of gastrointestinal, hepatobiliary and pancreatic disorders.
- Surgical emergencies in gastrointestinal tract diseases.

XXII) Hematology and Neoplastic diseases

- Physiology of erythropoiesis, leukopoiesis and physiology of hemostasis.
- Etiology, pathophysiology, pathogenesis, clinical features and management of hematological and oncological diseases.
- Laboratory diagnosis and other relevant diagnostic and therapeutic modalities in hematological and oncological disorders.
- Pharmacotherapy of Hematological and Oncological Diseases.
- Component therapy in Pediatric Practice.

XXII) Nephrology and genitourinary tract

- Development and developmental anomalies of the kidneys and the genitourinary tract.
- Physiology of urine formation and metabolic functions of the kidney.
- Etiology, pathophysiology, pathogenesis, clinical features and management of various disorders of the kidney and the genitourinary tract.
- Pathological features of diseases of the kidney and genitourinary tract.
- Relevant diagnostic and therapeutic modalities for diseases of the kidney and the genitourinary tract.
- Pharmacotherapy of renal and genitourinary disorders.
- Management of end stage renal disease.

XXIV) Central and peripheral Nervous System

- Development of the brain, spinal cord and peripheral nervous system and their anomalies.
- Neurological evaluation of newborns, infants and children.
- Etiology, pathophysiology, pathogenesis, clinical features and management of various diseases affecting central nervous system and peripheral nervous system.
- Seizures in childhood.
- Neuromuscular diseases – etiology, clinical features, pathophysiology and management.

XXV) Endocrine system

- Synthesis, physiological functions and pharmacological actions of various hormones.
- Disorders of the endocrine glands.
- Pubertal development and its disorders.

XXVI) Congenital and acquired disorders of eye, ear, nose, throat, bones and joints.

XXVII) Miscellaneous diseases

- Unclassified diseases including SIDS, Sarcoidosis, Progeria histiocytosis, chronic fatigue syndrome.
- Metabolic bone diseases.
- Genetic skeletal dysplasias.

XXVII) Development of diagnostic approach for and interpretation of symptomatology and clinical signs in infants, children and adolescents.

XXVIII) Basics of Research Methodologies and Ethical aspects of Clinical Research

5. List of skills

1. Elicitation of history from parents, guardians, relatives and patients regarding complaints previous diseases and therapy, events around birth, prenatal period, growth and development, diet and immunization, socio-educational and economic background and other relevant aspects.
2. Conduct physical examination of well and sick newborn babies, infants, children, adolescents and adults.
3. Accurately measure length or height, weight, head circumference and plot the data on an appropriate chart.
4. Accurately measure mid-arm circumference of children aged 1-5 years.
5. Identify abnormal growth patterns.
6. Interpret data obtained by anthropometric measurement and developmental assessment.
7. Assess nutritional status and determine if the child is getting adequate nutrition.
8. Provide nutritional advice for newborn babies, infants, children and adolescents.
9. Provide advice regarding breast-feeding, weaning and balanced diet.
10. Provide advice regarding healthy & hygienic practices with a view to prevent diseases, disorders, injuries, accidents and poisoning.
11. Develop a diagnostic approach for clinical problems in newborns, infants, children and adolescents.
12. Discuss the characteristics of the patient and of the illness that must be considered when making the decision to manage the patient in the outpatient setting or admit to hospital.
13. Discuss the differential diagnosis of symptoms, signs and presentations in neonates, infants, children and adolescents.
14. Undertake relevant investigations for diagnostic and prognostic evaluation taking into consideration the risks, benefits and costs involved.
15. Convince parents and guardians regarding undertaking investigations and obtain their co-operation and valid legal consent.
16. Interpretation of laboratory Reports.

Counseling parents regarding the child's health status, health needs, illness & disabilities

17. Performance of Diagnostic & Therapeutic Procedures:

- Venepuncture (10)
- Intravenous access for administration of drugs and intravenous fluids (10)
- Administration of drugs via intra-dermal, intra-muscular or subcutaneous routes (5 each)
- Administration of drugs and fluids through intra-osseous route (2)
- Lumbar puncture to draw out cerebro-spinal fluid for examination (5)
- Sub-dural tap (2)
- Ventricular tap (1)
- Peritoneal (Ascitic) tap for diagnostic and therapeutic purposes (2)
- Pleural tap for diagnostic and therapeutic purposes (4)
- Collection of blood from an artery for arterial blood gas analysis (4)
- Obtaining Central IV Access (3)
- End tracheal Intubation in Newborn babies, Infants, Children & Adolescents (5)
- Cardiopulmonary Resuscitation (5)
- Supra-pubic tap for obtaining a urine sample (5)
- Administration of drugs via a nebulizer (5)
- Catheterization of the urinary Bladder (5)
- Liver Biopsy (4)
- Kidney Biopsy (2)
- Arterial Cannulation for monitoring of Blood Pressure (5)
- Peritoneal dialysis (2)
- Cannulation of the umbilical vessels (7)
- Exchange Transfusion (5)
- Bone Marrow aspiration (2)
- Bone Marrow Biopsy (2)
- Pericardiocentesis (2)
- Cardioversion (4)

(The numbers in the brackets indicate the minimum number of the procedure that a post-graduate student needs to observe/ assist/ perform/ supervise)

6. Teaching/Learning Activities and Opportunities

Inpatient management

Outpatient Management

Presentation of cases on Clinical Rounds

Topic presentation.

Case discussions.

Clinicopathological conferences.

Clinicoradiological conferences.

Biopsy Meetings.

Mortality Review Meetings

Journal Club

Guest Lectures

In-house lectures

Conferences,

Seminars.

CME sessions

Participation in Workshops

Presentation of Papers

Teaching Undergraduate students.

Teaching Postgraduate students & paramedical staff.

Use and Maintenance of biomedical equipments and gadgets

Counseling regarding performance of procedures, disease process and prognostication

Group discussions Sessions

Assisting in diagnostic and therapeutic procedures.

Performing diagnostic and therapeutic procedures.

Patient/Health education.

7. Research

All the postgraduate students will be exposed to Research Methodologies through their participation in the Journal Club.

A candidate registered for M.D. (Pediatrics) will be submitting a dissertation to the university. This will be a pre-requisite for appearing for the MD examination. The dissertation will be done under the guidance and full satisfaction of the post-graduate teacher under whom the candidate is registered.

8. Reference Books and Suggested Reading

(A) Books & Textbooks

(I) General Medicine & Pediatrics

- Nelson Textbook of Pediatrics (Behrman)
- Forfar Textbook of Pediatrics (Campbell).
- Rudolph's Pediatrics (Rudolph).
- Pediatric Medicine (Avery).
- Textbook of Pediatrics (Udani).
- Manual of Pediatric therapeutics (Graef).
- Manual of Neonatal Care (Cloherty)
- Common symptoms (Illingworth).
- Pediatric diagnosis (Green).
- Signs and symptoms in Pediatrics (Tunnessen).
- Harrison's Principles of Internal Medicine.
- Mcleod's clinical methods.
- IAP Textbook of Pediatrics
- Harriet Lane Handbook (Barone).
- Handbook of Pediatric Physical diagnosis (Barness)

(II) Super-speciality Reference Books

Neurology : Pediatric Neurology : Principles and Practice(Swaiman)
Clinical Pediatric Neurology :A Signs and symptoms approach (Fenichel)

Nephrology: Pediatric kidney diseases (Edelmann).
Pediatric Nephrology (Holliday).
Clinical Pediatric Nephrology (Kher & Makker).

Cardiology: Nada's Pediatric Cardiology (Fyker).
Heart Disease in Infants, children and Adolescents (Adams-Moss's).
Rheumatic fever (Markowitz).
Peroiff - Pediatric Cardiology for Practitioner's (Myung Park).
How to read Pediatric ECGs (Park).

Hematology: Clinical hematology in medical practice (de Gruchy's).
Blood diseases of infancy and childhood (Miller).
Nathan & Oski's Hematology of Infancy and childhood (Nathan).
Living with Thalassemia (Aggarwal)

Gastroenterology: Pediatric Gastroenterology (Sheila Sherlock)
Liver disorders in childhood (Mowat)
Paediatric Gastroenterology (Anderson).

Respiratory: Kendig's disorders of the respiratory tract in children (Chernick).

Infectious Diseases & Parasitology:
Poliomyelitis (Huckstep).
Tuberculosis in Children. (Miller)
Essentials of Tuberculosis in children. (Vimlesh Sheth)
Parasitology (Charterjee)
Textbook of Pediatric Infections diseases(Fegin & Cherry)

Growth & Development :
The Development of the Infant and Young Child – Normal & Abnormal (Illingworth)
The Normal Child (Illingworth).

Miscellaneous : Protein Energy Malnutrition
a) Alleyne,
b) Waterlow.
Essentials of Human Genetics (Kothari & Mehta)
Genetics in Medicine (Thomson & Thomson).
Birth Defects encyclopedia (Buyses).
Smith's Recognizable Patterns of Human Malformation (Jones).
Breastfeeding – A Guide for the medical profession (Lawrence)
Medical Embryology (Langman).
Frontiers in social Pediatrics (Patwari)
Medical emergencies in children (Singh)

Immunization : Immunization in Practice (Mittal)
Immunization update (Mittal)

(B) Journals in Pediatrics & Other Periodicals

Year Book of Pediatrics – Stockman III

Indian Pediatrics

Indian Journal of Pediatrics

Pediatrics Today.

Archives of Diseases in Childhood

Pediatrics

Journal of Pediatrics

Drugs.

State of the World's Children (UNICEF)

Perinatology Clinics of North America

Recent Advances in Pediatrics

Advances in Pediatrics

Recent Advances in Pediatrics – Suraj Gupte (Ed.)

(C) Sub-speciality Journals

Pediatric Nephrology

Pediatric Cardiology

Pediatric Neurology

Pediatric Radiology

Pediatric Neurosurgery

Journal of Infection

9. Evaluation Form

(A) Postgraduate Seminars

Name: Date:

Seminar Topic:

Evaluation Points:

1. Presentation:
2. Completeness of Preparation:
3. Cogency of presentation:
4. Use of audiovisual aids.
5. Understanding of subjects:
6. Ability to answer questions:
7. Time scheduling:
8. Consulted all relevant literature:
9. Overall performance.

Guidance for Scoring	**0**	**1**	**2**	**3**	**4**
	Poor	**Below average**	**Average**	**Above average**	**Very Good**

Faculty members:

1.

2.

3.

Mean Score:

Evaluation Form

(B) Case Presentation

Name: Date:
Case Title:

1. Logical order in presentation:
2. Cogency of presentation:
3. Complete /Relevant history:
4. Accuracy of General Physical Examination:

   All signs elicited correctly.
5. Accuracy of Systemic Examination:
6. Diagnosis – Logical flow based on History & findings:
7. Order of differential diagnosis (logical):
8. Investigations required:

   (Complete list, Relevant order, Interpretation of investigations, Unnecessarily investigations asked)
9. Treatment: Principles & details
10. Patient/Relatives communication

    (Diagnosis & Management
    Health education)

Overall:

1. Abilities to react to questioning:
2. Abilities to defend diagnosis:
3. Ability to justify differential diagnosis:
4. Acceptability of plan of management
5. Confidence

Score	**0**	**1**	**2**	**3**	**4**
	Poor	**Below average**	**Average**	**Above average**	**Very Good**

Faculty members:

1.

2.

3.

Mean Score:

Evaluation Sheet
(C) Journal Club

Name: Date:

Points for consideration: Score

1. Choice of article relevant:
2. Cogency of presentation:
3. Whether understood and conveyed the purpose of the article:
4. How did he defend article:
5. Whether cross references have seen consulted:
6. Understood explained basics of statistic in article:
7. Whether relevant information mentioned from other similar articles.
8. Use of audio visual aids:
9. Presentation:
10. Response to questioning:

Score	**0**	**1**	**2**	**3**	**4**
	Poor	**Below average**	**Average**	**Above average**	**Very Good**

Faculty members:

1.

2.

3.

Mean Score:

Evaluation Form

(D) Clinical Work

Name: Date:

Points to be considered:

1. Punctuality:
2. Regularity of attendance:
3. Quality of ward work (procedures):
4. Maintenance of case records:
5. Presentation of cases during rounds (approach):
6. Investigation work up:
7. Bedside manners:
8. Rapport with patients:
9. Rapport with colleagues:
10. Motivation for blood donation:
11. UG teaching (if applicable):
12. Counseling patient's relatives:
13. Management of emergencies:
14. Knowledge of Pediatrics as a subject:

Score	**0**	**1**	**2**	**3**	**4**
	Poor	**Below average**	**Average**	**Above average**	**Very Good**

Faculty members:

1.

2.

3.

Mean Score:

M.D. IN Pathology

CURRICULUM FOR POST GRADUATE COURSE IN PATHOLOGY

M.D. IN PATHOLOGY

GOAL :

The goal of postgraduate medical education shall be to produce competent specialist.

(i) Who shall recognize the health needs of the community and carry out professional obligation ethically and in keeping with the objectives of the national health policy;

(ii) Who shall have mastered most of the competencies, retaining to the speciality, that are required to be practiced at the secondary and tertiary levels of the healthcare delivery system.

(iii) Who shall be aware of contemporary advances and developments in the discipline concerned.

(iv) Who shall have acquired a spirit of scientific inquiry and oriented to the principles of research methodology and epidemiology ;and

(v) Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

OBJECTIVES :

At the end of the course a candidate must be able to

(i) Understand and explain about the factors in causation of disease.

(ii) Understand processes involved in the gross and microscopic changes of organs and tissues and explain these changes.

(iii) Understand and explain the basis of evolution of clinical signs and symptoms.

(iv) Should be able to perform procedures designated for laboratory detection of diseases. Should be able to process and accurately interpret the representative materials obtained from the patients in order to arrive at a correct diagnosis.

(v) Should be able to recognize and report morphological changes in cells, tissues and organs.

(vi) Should be able to plan, perform and report specific research projects.

(vii) Should be able to perform clinical autopsy and present CPC (Clinico Pathological Correlation)

METHODS OF TRAINING

Duration of course – 3 years.

1.On job training

- Histopathology including techniques and reporting
- Cytology including FNAC ,fluid cytology ,exfoliative cytology- techniques and reporting
- Haematology including blood banking and transfusion medicine- techniques and reporting
- Clinical pathology- techniques and reporting
- Museum techniques
- Autopsy techniques and interpretation
- Serology- techniques and reporting
- Handling of hazardous material
- Handling, maintenance and calibration of instruments used in laboratory
- Undergraduate teaching

2.P.G. Teaching sessions

- Journal review
- Subject seminar
- Grossing discussions for autopsies and surgical material
- Slide seminar including histopathology ,haematology, and cytopathology
- Clinical case- group discussion
- Interdepartmental seminars

Post graduate students should be encouraged to attend CME, Workshops, Conferences & present papers.

TEACHING /LEARNING CONTENT

A. THEORY

I BASIC SCIENCES

1. Anatomy/histology of all structures in human body/organs
2. Physiology and biochemistry-Basic aspects of various metabolism and functioning of endocrines
3. Genetics-Fundamental / applied aspects
4. Biostatistics
5. Biomedical ethics-ethical issues related to Medical practice and research

II PATHOLOGY

1. Historical aspects
2. General pathology
3. Systemic pathology
4. Haematology
5. Blood banking and Transfusion Medicine
6. Cytopathology
7. Clinical Pathology
8. Medical autopsy: Techniques and interpretation
9. Recent advances in all fields ,related to Pathology
10. Organization of laboratory including quality control

III CLINICAL BIOCHEMISTRY

Routine biochemical investigations and various organ function tests i.e. LFT ,RFT etc.

B. PRACTICAL

Proficiency of technological methods should include the following:

1. Fields in which high degree of professional competence and theorotical knowledge is expected:-

a) Gross pathology and histopathology
b) Haematology
c) Cytopathology
d) Clinical pathology and Blood banking

2. Fields in which student is expected to achieve reasonable working knowledge and skills to be able to run laboratory services independently

a) Clinical chemistry
b) Serology

3. Fields in which student is expected to achieve general acquaintance of techniques to understand and interpret data

a) Immunopathology
b) Histochemistry
c) Immunohistochemistry
d) Cytogenetics
e) Molecular biology
f) Medical statistics

POSTING SCHEDULE:

1) Histopathology and Autopsy	:-	15 months
2) Clinical pathology Haematology Cytopathology Blood Bank	:-	15 months
3) Biochemistry	: -	1 month
4) Serology	:-	15 days
5) Museum	:-	15 days
6) Revision in all sections	:-	4 months
TOTAL		36 months

RECOMMENDED MINIMUM TEXT BOOKS AND JOURNALS

BOOKS:

1 Cotran, Kumar, Collins. Robin's Pathologic Basis of Disease, published by W.B. Saunders & Company.

2.Ivan Damjanov, James Linder. Anderson's Pathology, published by C.V. Mosby Company.

3. J. B. Walter, M.S. Israel. General Pathology, published by Churchill Livingstone.

4. Emeritus W.ST. Symmers Systemic Pathology, published by Churchill Livingstone.

5. Juan Rosai, Ackerman's Surgical Pathology, published by C.V. Mosby Company.

6. Leopold G Koss, Diagnostic cytology and its histopathologic basis published by J.B. Lippincott Company.

7. Marluce Bibbo, Comprehensive cytopathology, published by W.B Saunders Company

8. Winnifred Grey, Diagnostic cytopathology, published by Churchill Livingstone

9. Orell, Sterrett- Walters and Whittaker, Fine Needle Aspiration Cytology (Manual & Atlas), published by Churchill Livingstone

10.Greer J.P, Foerster J,Jukens J et. al Wintrobe's Clinical Haematology, published by Lippincott Williams and Wilkins

11. Firkin F , Chesterman C, Penington D, de Gruchy's Clinical Haematology in Medical Practice, published by Blackwell Sciences

12. Henry J.B Clinical Diagnostics and Management by Laboratory Methods. published by W.B. Saunders & Company.

13. Lewis S.M, Bain D.J, Bates I, Dacie & Lewis Practical Haematology published by Churchill Livingstone.

14. Hoffbrand A.V, Catovsky D, Tuddenham G.D, Postgraduate Haematology – published by Blackwell publishing

15 R.Anantnarayan , C.K.Paniker, Textbook of Microbiology , published by Orient Longman.

16. Harshmohan ,Textbook of pathology , published by Jaypee.

17. Parasitology (Protozoology & Helminthology.) in relation to clinical medicine – K.D.Chatterjee – published by Chatterjee Medical Publication.

18. Sudha R.Kini ,Colour Atlas of differential diagnosis in exfoliative and aspiration cytopathology , published by Lippincott, Williams & Wilkins.
19. Praful B. Godkar ,Clinical Biochemistry – Principles & practice , published by Bhalani Publishing House, Bombay.
20. Theory & practice of Histological Techniques edited by John .D.Bancroft- published by Chruchill Livingstone.
21. Enzinger & Weiss, Soft Tissue Tumours, Published by B.I.Publications (India.) C.V.Mosby company.
22. Elder D.E, Lever's Histopathology of the skin – Published by J.B.Lippincott Company.
23. Novak & Woodruff Edited, Novak's Gyanaecologic and Obsteric Pathology, published by – Kiaku Shoin/Saunders.
24. Christopher D.M. Fletcher, Diagnostic Histopathology of Tumours Vol.1 & 2- published by Chruchill Livingstone.
25. Recent advances in Histopathology, Haematology, Blood coagulation etc.
26. AFIP, Atlas of tumour pathology.
27. Interpretation of Breast Biopsies - Carter
28. Day D.W, Jass J.R, Price A.B, Morson and Dawson's Gastrointestinal Patholgy, published by Blackwell publishing .
29. Ellison D, Love S, Chimelli L et. al, Neuropathology , published by Mosby
30. Epstein Prostate Biopsy Interpretation, published by Lippincott- Raven
31. Fogo A.B,Kashgarian M, Diagnostic Atlas of Renal Pathology, published by Elseiver Saunders
32. Foster C.R, Pathology of the Urinary Bladder, published by Saunders
33. Fox H, Wells M ,Haines & Taylor - Obstetric and Gynaecological Pathology, published by Chruchill Livingstone
34. Ioachim H.L,Lymphnode Pathology, published by Lippincott
35. Kilpatrick, Renner, Diagnostic Musculoskeletal Surgical Pathology, Clinicoradiologic & cytologic correlations,published by Saunders
36. Kurman R.J, Blaustein's pathology of the female genital tract, published by Springer
37. LeslieK.O,Wick M.R, Practical pulmonary pathology; a Diagnostic approach, published by Churchill Livingstone
38. MacSween, Butt, Portman et al,Pathology of the liver- published by Churchill

Livingstone
39. Mills S.E, Sternberg's diagnostic surgical pathology, published by Lippincott Williams and Wilkins
40. Montgomery E.A, Biopsy interpretation of the Gastrointestinal Tract Mucosa, published by Lippincott Williams and Wilkins
41. Odze R.D, Surgical pathology of the GI Tract, Liver, Biliary Tract and Pancreas, published by Saunders
42. Owen D, Pathology of the Gall Bladder , Biliary Tract, and Pancreas, published by Saunders
43. Pilch B.Z, Head and Neck surgical pathology, published by Lippincott Williams and Wilkins
44. Rosen P,Pathology of Breast, published by Lippincott Williams and Wilkins
45. Silverberg S.G, Atlas of Breast pathology, published by Saunders
46. Weedon ,Skin Pathology, published by Churchill Livingstone
47. Wickremsinghe, Blood and Bone marrow pathology, published by Churchill Livingstone
48. Atkinson B, Atlas of diagnostic pathology, published by Saunders
49. Cibas E.S, Cytology:Diagnostic principles and clinical correlates, published by Saunders
50. Geiinger, Modern cytopathology
51. Naib Z.M,Cytopathology, published by Little Brown and company
52. Meisels A, Morin C, Cytopathology of the uterine Cervix, published by ASCP Press
53.Miettinen M,Diagnostic soft tissue pathology, published by Churchill Livingstone
54. Chandler F.W,Pathologic diagnosis of fungal infection,published by ASCP Press
55. Collins R.D, Paediatric Haematopathology, published by Churchill Livingstone
56. Hoffman , Benz, Shattil,Haematology :Basic principles and practice,published by Churchill Livingstone
57. Naeim F, Atlas of bone marrow and blood pathology, published by W. B Saunders
58. Tkachuk D.C,Atlas of clinical haematology, published by Saunders
59. WHO Classification of tumours, published by IARC Press.
60. Mollison P.L, Blood transfusion in clinical medicine, published by Oxford, ELBS & Blackwell Scientific Publication
61. Chitale A, Pathology of urinary & male genital system for urologists, general surgeons & Pathologists published by B.I. Publications
62. Saran R.K., Transfusion medicine technical manual, published by WHO

JOURNALS:

1. British Journal of Haematology, published by Blackwell Sciences.
2. CANCER, International journal of American Cancer Society, published by John Wile & Sons Inc.
3. Journal of Clinical Pathology, published by B.M.J.
4. Haematology/Oncology Clinics of North America, published by W.B. Saunders & Company.
5. American Journal of Surgical Pathology, published by Lippincott & Raven
6. Indian Journal of Pathology & Microbiology, published by IAPM.
7. Indian Journal of Cancer, published by Indian Cancer Society.
8. Indian Journal of Cytology, published by IAC.
9. LANCET published by Elsevier
10. I.C.M.R. Bulletin, published by ICMR
11. Histopathology , journal of the British Division of the International Academy of Pathology-Published by Blackwell Science
12. Acta Cytologica,The Journal of Clinical Cytology and Cytopathology
13. Archives of Pathology and Laboratory Medicine-Published by American Medical Association
14. Human Pathology- Published by W.B. Saunders & Company.
15. American Journal of Clinical Pathology published by ASCP
16. Indian Journal of Cytology
17. WHO Bulletin published by WHO
18. Indian Journal of Urology
19. Modern Pathology
20. Indian journal of Leprosy published by Indian Leprosy Association
21. New England Journal of Medicine published by Massachusetts Medical Society

ADDITIONAL READINGS:

1. Compendium of recommendations of various committees on health and development (1943 to 1975) DGHS, 1985 Central Bureau of Health Intelligence, DGHS, Ministry of Health & Family Welfare, Govt. of India, Nirman Bhavan, New Delhi-335.

2. National Health Policy, Ministry of Health & Family Welfare, Govt. of India, Nirman Bhavan, New Delhi-335. 1983.
3. ICMR, Policy, Statement of ethical considerations involved in research on Human subjects, 1982 ICMR, New Delhi.
4. Code of Medical Ethics framed under Section- 33 of Indian Medical Council Act , 1956 . MCI, Kotla road, New Delhi.
5. Santosh Kumar,The elements of Research ,writing and editing 1994,Dept. of Urology,JIPMER,Pondicherry
6. Srinivas D.K et al ,Medical Education Principles and Practices,1995.National Teacher Training Centres, JIPMER, Pondicherry
7. Francis C.M Medical Ethics, J.P.Publication,Banglore 1993
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 journal. N. Engl J Med 1991;424-8
10. Kirkwood B.R. Essentials of Medical Statistics, 1st ed. Oxford Blackwell Scientific Publications 1988
11. Mahajan B.K.Methods in Biostatistics for medical students,5th ed New Delhi, Jaypee Brothers Medical Publishers,1989
12. Raveendran B. Gitanjali, A Practical Approach to PG dissertation, New Delhi.J.P Publications 1998.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

Student's Record Book

M.D (Pathology)

DEPARTMENT OF PATHOLOGY

Name of the Student :

Dr. _____

Name of the Institute & Address:

_____

_____

_____

ABOUT THE LOG BOOK:

The log book has been prepared to maintain a record of academic and service activities of postgraduates and to provide an account of progress made by him/her. Maintenance of such log books will also allow a review of training programme and incorporation of improvements in the programme.

Postgraduates are required to carry the log book and get the entries made regularly. Faculty is requested to countersign. Log books have to be submitted to the head of the department before submitting the final examination form.

PERSONAL BIO-DATA

Paste Passport size Photograph here

Name of the Student : _____

Date of joining : _____

Probable date of appearing for Examination : _____

Date of Birth : _____

M.B.B.S from : _____

Year of passing MBBS : _____

Name of the State Medical Council : _____

Registration No. with date : _____

Permanent Address : _____

_____ PIN- _____

Phone No. : (_____) _____

Local Guardian's Address : _____

_____

_____ PIN _____

Phone No. : (_____) _____

_____

POSTING SCHEDULE :

SECTION	MONTH & YEAR		REMARKS	SIGNATURE OF SECTION I/C
	From…	To…..		
Clinical Pathology				
Cytopathology				
Haematology				
Blood Banking				
Histopathology				
Autopsy				
Biochemistry				
Serology				
Museum				
Revision in all sections				

ATTENDANCE AT P.G. TEACHING SESSIONS:

Month & Year	No. of Teaching Programmes held	No. of Teaching Programmes attended	Remarks	Signature of P.G. Teaching I/C

PARTICIPATION IN P.G. TEACHING ACTIVITY

Subject Seminars presented:

Date	Topic	Remarks	Signature of faculty

Journal Articles presented:

Date	Topic	Remarks	Signature of faculty

Group discussion of clinical cases:

Date	Topic	Remarks	Signature of faculty

Slide Seminars presented/participated:

Date	Topic	Remarks	Signature of faculty

SCIENTIFIC CONTRIBUTIONS

CME/ Workshops attended :

SN	Name of CME/ Workshop	Held at	Dates

Conferences attended :

SN	Name of Conference	Paper presented Yes/No	If yes, title of paper

Publications:

1. _____

_____

2. _____

_____

Awards:

_____

CERTIFICATE

This is to certify that Dr…….

has completed the tenure for M.D. satisfactorily .

P.G.Teacher.	**P.G.Teaching Programme Incharge**	**Professor & Head. Department of pathology**

EVALUATION SYSTEM

A. DISSERTATION

a) Thesis / Dissertation is compulsory. Every candidate is required to carry out the work on a selected research project under the guidance of a recognized post graduate teacher. The results of such work shall be submitted in the form of a Dissertation.

b) The Dissertation is aimed at training the candidate in research methods and techniques. It includes identification of a problem , formulation of a hypothesis , search and review of relevant literature , getting acquaintance with recent advances, designing of research study , collection of data , critical analysis of results and drawing conclusions.

c) The title of the topic along with the plan of work not exceeding 500 words in prescribed proforma should be submitted to the University with the recommendation of guide through proper channel within a period of 3 months from the date of registration for the postgraduate course. There should not be an overlap of topic, cases, material or the related data among the candidates within the department during the period of actual Dissertation work. Prior approval by the local Ethical Committee is essential .

Unless communicated otherwise within a period of 2 months from the date of receipt of plan of work by University, it shall be assumed that topic of Dissertation is approved and no communication is necessary in this regard. The last date for submission will not be extended without prior permission from the University. In case of delay in submission of topic of Dissertation and plan of work , the period of training of the candidate will be proportionately extended for which the entire responsibility shall be upon the candidate .

d) The volume of the Dissertation should be reasonable and may vary depending on the topic. The bibliography should be as per Vancouver system.

e) Four copies of the Dissertation complete in all respect certified by the guide should be submitted to the University through proper channel 6 months before the final examinations to the registrar (evaluation)

f) The identity of the candidate/ teacher/ Department /College / Place should not be disclosed in the Dissertation .Acknowledgement should not be included in the Dissertation.

g) Certificates issued by guide, countersigned by Head of the Department and the Dean certifying therein that the work done by the candidate has been carried out under the supervision of the guide to his/her entire satisfaction, should be submitted separately to the University.

h) Dissertation approval is a prerequisite for appearing at the University exam. In case the Dissertation is not accepted, the same shall be communicated to the candidate along with reasons for rejection at least 2 months prior to the commencement of theory exam.

i) The candidate may make necessary corrections and resubmit the Dissertation at least 1 month prior to the commencement of theory exam.

B. LOG BOOK (Work diary)

The postgraduate students should include all their activites in the log book. The annual assessment based on the work diary shall be done by the guide, teacher in charge of postgraduate teaching programme and HOD.

C. UNIVERSITY EXAMINATION (*As per Direction No. 01/2008 dtd. 26/05/2008)*

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

OBJECTIVES OF CURRICULUM PLANNING

FOR PG DEGREE

OBJECTIVES

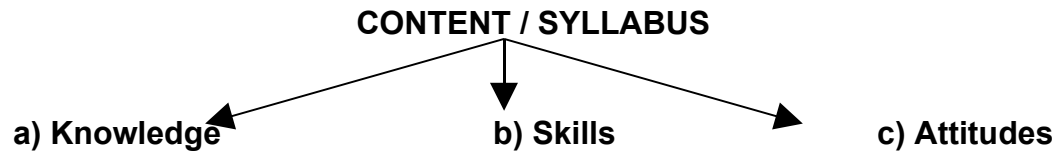
1) Therapeutic :
   a) To examine, diagnose and treat psychiatric disorders.
   b) Consultation – Liason psychiatry in general hospital.

2) Preventive and Promotive
   a) Prevention of relapses and complication of psychiatric disorders and addictive behaviour.
   b) Rehabitation of mentally ill patients.
   c) Promotion of mental health in the population in terms of improving mental well being & Quality of life.

3) To inculcate an empathic attitude that allows an integration of humanistic and Ethical approach in medicine.

4) To Apply Research Methodology in the field of psychiatry

5) To be aware of Knowledge of recent advance in psychiatry.



a) <u>KNOWLEDGE:</u>

1. BASIC SCIENCES AS APPLIED TO PSYCHIATRY

- NEUROANATOMY
  - Developmental
  - Central peripheral autonomic
  - Principles of Brain imaging

- NEUROPHYSIOLOGY
    - Normal sleep
    - Basic cell
    - Of thought ,cognition mood and Motor function
- NEUROCHEMISTRY
    - Neurotransmitters
    - In emotion, memory,behaviour
- Applied Neurophysiology., Neurochemistry., Neuroanatomy in relation to physical factors affecting psychiatric disorders.

PSYCHOLOGY

- Basic principles e.g. Learning, memory, motivation, emotion and stress etc.
- Applied psychology – behaviour science
- Sensory processes and perception
- Thinking and language
- Social perception, Influences and relationships
- Attitudes and beliefs
- Developmental psychology child development
- Personality structure
- Psychological assessment and testing (IQ and cognition)
- EEG
- Genetics

2. PSYCHIATRY, NEUROLOGY, NEUROPSYCHIATRY AND BEHAVIOURAL MEDICINE

PSYCHIATRY

- Introduction to mental health and psychiatric disorders
- History taking and clinical examination in psychiatry
- Classificatory systems.
- History of Psychiatry
- Schizophrenia and other psychotic disorders.
- Mood Disorders
- Anxiety and Somatoform and dissociative disorders
- Substance related disorders
- Sexual disorders
- Sleep disorders
- Eating disorders
- Psychiatric disorders due to General Medical Consumption including HIV
- Disaster and Psychiatry
- Special population in psychiatry
- Personality disorders
- Impulse control disorders
- Adjustment disorders
- Relational problems
- Psychiatric emergencies
- Deliberate self harm / Suicide

- Transcultural psychiatry
- Child and adolescent psychiatry
- Family psychiatry
- Geriatric psychiatry
- Community psychiatry in relation to India (NMHP)
- Forensic psychiatry (Mental Health Act)
- Ethics
- Human rights
- Rehabilitation.
- Psychosomatic disorders including stress
- Therapies
    a) Biological - ECT and Psychopharmacology
    b) Psychosocial interventions
    c) Psychotherapy
    d) Behaviour therapy
    e) Therapies based on Indian philosophy

NEUROLOGY, NEUROPSYCHIATRY

- Clinical history and CNS examination
- Head injuries
- Alcohol and substance
- Toxic & metabolic & endocrine Disorders
- Nutritional
- Dementias
- Delirium
- SOL

- Infections and inflammatory diseases including HIV
- Movement disorders
- Epilepsy
- CVA
- Investigations

MEDICINE AS RELATED TO PSYCHIATRY

Consultation liason psychiatry

Medicine and allied

Surgery and allied

Gynecology and Obstetrics and allied

b. **SKILLS**

- Communication skills
- History taking and interview
- Mental status evaluation & Physical Examination with neurological examination
- Diagnostic formulation and comprehensive plan of management
- Appraisal of Psychometry ie Intelligence , personality
- Handling emergencies and liaison services
- Psycho-education skills
- Ethical discharge of duties
- Tackling medico legal issues
- Psychotherapy and counseling
- Behavior Therapy
- Interpretation of EEG, C T, MRI
- Biological therapies including ECT & Psychopharmacology

c. ATTITUDES AND VALUES

- For professional and ethical conduct
- Humanistic and empathic relationship with patients, relatives and colleagues.

d. TEACHING LEARNING METHODS

Cognitive:

- Lectures
- Tutorials
- Seminars
- Symposium
- Didactic Small group teaching
- Workshop
- Self study
- Inter disciplinary conference
- Research forum

Skills:

- Demonstrations
- Case conference
- Research project
- Workshops
- Bedside clinics
- Journal review
- Psychotherapy and Behavior Therapy session

Attitude:

- Roll play
- Audio-visual
- Workshops
- Demonstration

EVALUTION: (*As per Direction No. 01/2008 dtd. 26/05/2008 & practical scheme is as per revised practical marksheet.)*

Dissertation /Thesis

- **Time spent should be one year**
- **Supervision**
- **Evaluation mandatory**

Log book of all the academic activities of students

- **Attitude:**
    - Structured evaluation and Scales
    - Group Discussion
    - Log Book
    - Clinical - patient relationship

RECOMMENDED BOOKS AND JOURNALS:

- Psychology - Morgan King
- Anatomy - Snelles
- Physiology – Guyton
- Symptoms in the mind – Sims
- Comprehensive Textbook of psychiatry – Kaplan
- Postgraduate psychiatry – Niraj Ahuja(Indian text book)
- Oxford Text book of Psychiatry
- Organic psychiatry – Lishmann
- Indian Journal of Psychiatry

SYLLABUS FOR M.D. (RADIO-DIAGNOSIS & IMAGING SCIENCES).

GOAL:- The broad goal of the teaching & training of Post-graduate student in Radio-Diagnosis is to
make them understand & implement the knowledge regarding the role of various imaging modalities,
helpful in the management of different clinical conditions. At the end of his/her training, he/she should be
capable to take up a career in teaching institution or in diagnostic center or in research..

OBJECTIVES :-

a) Knowledge:- At the end of the course the student shall be able to:
1) Explain the interaction of tile X-rays with mater to produce an image.
2) Fromiliarize with the principles of various imaging modalities (e.g. .US/CT/MRI) & their applications
in medicine.
3) Explain the biological hazards of ionizing radiation & protective measures.
4) Explain the normal Anatomy, Physiology of various organs and their deviation from normal) & its
consequences.
5} Summarize the fundamental aspects of embryology & alteration in development with reference to
congenital anomalies.
6) Select appropriate imaging modality for- study of specific condition.
7) Explain .the role of imaging, pre-operative, intra-operative & post-operative Conditions.
8) Evaluate role of imaging modalities in various therapeutic applications (lnterventional Radiology)
9) Update information about recent advances in imaging sciences.
10) Effectively organize & supervise the diagnostic proceduces to ensure quality control/assurances

b) Skills:-

At the end of the course the student shall be able to :
1) Make use of conventional & other imaging sciences to achieve definitive diagnosis.
2) Analyse & interpret imaging data.
3) Demonstrate the skills of solving Scientific & clinical problems & decision making.
4) Develop skills as a self:-directed learner recognize cointinuing educational needs, select & use
appropriate learning resources.
5) Demonstrate Comperence in basic concepts of research methodology & be able to critically aualyse
relevant literature.

c) Integration-

Knowledge acquired in Radio diagnosis shall help the students to integrate imaging techniques
with structure & function of the human body in health & disease.

M.D. (RADIODIAGNOSIS)

PAPER –I

Radiation Physics. Protective measures & Radiological procedures,
TOPICS

1) Radiations and production of X-rays
2) X-ray generators
3] Basic interactions between X-Rays and matter
4] Attenuation.
5] Filters and grids.
6] Luminescent screens.
7] Physical and Photographic characteristics of X-ray film & film processing
8] Computed tomography.
9] Ultrasound.
10] Radiation's hazards and protection.
11] Digital Radiography.
12] Nuclear magnetic resonance.
13] Magnetic resonance imaging.
14] Wet processing of films -Chemistry of Developer, fixer etc,
15] Dry processing – chemistry of films & its processing.
16] Radiological procedures(IVU, barium procedures, antegrade pyelography , fistulography, sialography, DCG)

PAPER- II

Radiological Imaging in congenital & systemic diseases- I

a. Respiratory system: Congenital anomalies, Pediatric chest, Chest wall, pleura, diaphragm, Mediastinum, Pulmonary infections, Airway obstruction, Pulmonary neoplasms, Diffuse pulmonary diseases.
b. Cardio-vascular system: Congenital heart Disease's, left-to-right shunts Cyanotic heart diseases,Acquired valvular heart diseases, Ischemic heart disease, Pulmonary circulation, cardiomyopathy, cardiac tumors, Pericardium, thoracic aorta.
c. Gastro Intestinal Tract: Oesophagus, Stomach, Duodenum, Small intestine large bowel, mesentry & omentum, Pediatric abdomen.
d. Hepato-biliary: Liver, Biliary tract, Pancreas.

PAPER-III

Radiological Imaging in congenital & systemic diseases-II

a. Skeletal system: Skeletal trauma benign lesions, malignant lesions, Myeloproliferative & similar disorders, metabolic and endocrine diseases, skeletal dysplasias and malformation syndromes,joint disease, bone and joint infection, radiology of soft tissues, musculo-skeletal system inchildren.
b. Genito-urinary system: Renal parenchymal diseases, Renal masses. Calculus disease and urinaryobstruction, urinary bladder and prostate, Reno-vascular

disorders, injuries, Renal failure andtransplantation, pediatric uroradiology Imaging in obstretics and gynecology, imaging of breast.

c. CNS: Skull, Intra-cranial tumors, Intra-cranial infections, Cerebro-vascular disease, cranial and intracranial malformatins trauma, CSF disturbances, degenerative diseases of spine infections of spine, spinal tumours.

PAPE R – IV

Miscellaneous, Interventional Radiology & Recent advances and Newer imaging.

a) Orbit , ENT, dental
b) Reticuloendothelial system
c) Interventional radiology:
    I. HSG & FTR
    II. 4 vessel angiography
    III. Biliary intervention(PTBD,PTC)
    IV. PCN
    V. Laser ablation of varicose veins
    VI. RFA/ chemoembolisation of hepatic tumour and malformations.
    VII. Vertebroplasty.
    VIII. Hemangioma and AVM management.

Syllabus for MD

A. RADIOLOGICAL PHYSICS & X-RAY TECHNOLOGY:

1. Radiation
2. Production of X -Rays
3. X- Ray Generators :
4. Basic Interaction between X- Rays and Matter
5. Attenuation
6. Filters
7. X- Ray beam restrictors
8. Physical characteristics of x- Ray films & film Processing
9. Photographic characteristics of X- Ray films
10. Fluroscopic imaging and image intensifier
11. Viewing & recording of the Fluroscopic Image
12. The Radiographic Image
13. Geometry of the Radiographic Image
14. Computed Tomography
15. Ultrasound
16. Digital Radiography
17. Nuclear Magnetic Resonance
18. Magnetic Resonance Imaging
19. Radiation hazards & Protection
20 Electric & Protection
21. Cine Angiography:
22. Atomic structure, Radioactive Isotopes & Gamma Camera
23. Positron Emission Tomography
24. Digital Subtraction Angiography
25. Catheters, guides wires, dilators, balloons & stents
26. Pictorial Achieving & Communicating System (PACS)
27. DICOM

B. DARK ROOM TECHNIQUES:

1. Intensifying screens /construction, types and advantages :
2. Rare earth intensifying screens :
3. Intensification factor :
4. Cassette: .construction & care
5. Factors affecting image details :
6. Factors affecting image contrast & density :
7. Grids : construction & types
8. Cones & collimeter :
9. X Ray films -construction, types & storage :

C. BASIC RADIOLOGY

I. IMAGING TECHNIQUIES AND MODALITIES

a) Department Organization: Digital Imaging and PACS:
   i. Digital imaging and PACS: Picture Reliving and Communication System
   ii. Digital Imaging and PACS: what should a radiologist expect from PACS
   iii. Digital Imaging and PACS: Image processing in Computed Radiography
b. Intravascular Contrast Media
c. Whole body Computed Tomography: Recent Advances
d. Magnetic Resonance Imaging Basic Principles
e. Ultrasound : general Principles
f. Radionuclide imaging
   i. Radionuclide imaging: General Principles
   ii. Radionuclide imaging: Pediatric Nuclear Medicine
g. Dual Energy X-ray Absorptiometry
h. Functional and Physiological Imaging
i. Medicolegal issues in Diagnostic Radiology
j. Radiation Protection and patient doses in diagnostic radiology

II. RESPIRATORY SYSTEM :

1.1 Techniques of Investigations

1.11 Standard Techniques
1.1.2 Tomography: a) Conventional film Tomography
b) Computed Tomography
1.1.3 Digital Radiography
1.1.4 Magnetic Resonance Imaging
1.1.5 Radionuclide Imaging a) Ventilation
b) Other thoracic scanning techniques
1.1.6 Ultrasound
1.1.7 Angiography
1.1.8 Lung Biopsy & Other Interventional Techniques.

1.2 Normal Chest:

1.2.1 The Lungs (Radiological Anatomy} & CT Terminology)
1.2.2 The Central Airways
1.2.3 The Lungs beyond Hila
1.2.4 The Hila
1.2.5 The Mediastinum :
a) CT & MRI
b) Plain film appearances
   i. The junctional lines :
   ii. The right Mediastinum above azygous vein
   iii. The left Mediastinum above Aortic arch
   iv. vi) The supra aortic Mediastinum on lateral view
   v. v) The right Middle Mediastinum border below azygous arch.
   vi. vi) The left cardiac border below aortic arch
   vii. vii) The para spinal lines
   viii. viii) The retrosternal line
1.2.6 The Diaphragm

1.3 The Chest Wall, Pleura & Diphragm

1.3.1 Chest Wall :

i) Soft tissue /Breasts

ii) Ribs /Sternum/Clavicle, Spine

1.3.2 The Pleura :

i) Normal Pleura

ii) Pleural Pathologies

1.3.3 The Diaphragm :

i) Height/ Eventration/Movements/Paralysis

ii) Hernias/Trauma/Neoplasm

1.4 The Mediastinum :

1.4.1 Techniques. .

1.4.2 Mediastinal Masses: i) Thyroid/ Para Thyroid Messes/Thymic tumors/Tymic hyperplasia/Teratoma/ Cermcell Tumor.

ii) Mediastinal lymphadenopthy

iii) Neurogenic Tumors

iv) Extra medullar heamatopes/Mesenchymal Iumors/ Hernarationof / Mediastinal lipomatosis/ Aneusyrum

1.4.3 Differential Diagnosis:

1.4.4 Other Mediastinal Lesions: i) Acute/ fibrosing Medlastinitis

1.5 Pulmonary Infections in Adults .

1.5.1 Pneumonia

1.5.2 Associated features and complications of pneumonia

1.5.3 Pulmonary tuberculosis

1.5.4 HIV & AIDS

1.6 Large Airway Obstruction :

1.6.1 Collapse: General features /Collapse of individual lobes / entire lung/ segmental collapse/

Rounded /obstructive collapse

1.6.2 Obstructive Pneumonities/ Bronchoscope/Broncheietasis

1.7 Pulmonary lobar Collapse essential considerations :

1.8 Chronic inflow Obstruction :

1.8.1 Asthama:

1.8.2 Choronic Bronchitis and Emphysema

1.8.3 Bronchiolitis

1.9 Pulmonary Neoplasms :

1 Bronchial Carcinomas

2 Benign Pulmonary Tumors

3 Malignant Lymphoma

4 Metastases

5 The solitary Pulmonary Nodule

2.0 Diffuse Pulmonary. Disease / Industrial Lung Disease / HRCT :

1 Pulmonary Oedema :

2 Diffuse pulmonary Haemorrhage

3 Inhalation of particulate matter

4 Diffuse pulmonary Fibrosis

5 Sarcoidosis / Collagen Vascular Disease *I* Systemic Vasculitidis *I* Lymphoid Disorders of Lungs / Pulmonary Eosinophilia *I* Drug induced Lung Disease

2.1 Chest Trauma :

2.2 Pulmonary Thromboembolism :

Imaging Chest Radiograph/ Radionuclide Study *I* Pulmonary Arteriography/ CT / MRI

2.3 .Post Operative & Critically ill Patients :

1 Cardiopulmonary Disease
2 Post Thoracotomy Radiograph
3 Support and Monitoring apparatus
4 Radiation Therapy

2.4 Chest Radiography after Lung Transplantation :

2.5 Congenital Pulmonary Anamolies :

1 Abnormal Development of Lung Bud
2 Abnormalities of separation of the lung had from the foregut
3 Abnormalities of Pulmonary Vasculature
4 Ectopic of Hamartomatous Development

2.6 The Infant and Young Child :

1 Pathologies of Diaphragm
2 Pleural Abnormalities
3 Inflammation
4 Airway Obstruction
5 Diffuse Lung Disease .
6 Respiratory Distress in Newborn Baby

2.7 Interventional Techniques in Thoracs:

1 Biopsy Procedures
2 Thoracic Drainage Procedure
3 Thoracic Sympathectomy
4 Therapeutic Embolisation
5 Dilatation & Stenting Techniques
6 Extraction Techniques.

III. THE HEART AND GREAT VESSELS

3.1 Cardiac Anatomy and Enlargement- :

3.1.1 Plain Radiography
3.1.2 Enlargement of various chambers on Plain Radiography

3.2 Magnetic Resonance of Heart and Circulation .

3.3 Congenital Heart Disease :

1 General Principles
2 Left to right shunts .
3 Central Sinuses
4 Other Congenital Heart Disease

3.4 Aquired Heart Disease: i) Non Rheumatic/ Rheumatic Mitral VD
ii) Tricuspid VD
iii) Aortic VD

3.5 Ischaemic Heart Disese : i) Coronary Atreriography
ii) Left Ventriculography
iii) Angina Pectoris
iv) Myocardial Infarction
v) Mechanical Complication of MI

3.6 Pumlonary Circulation : i) Anatomy and Physiology
ii) Pulmonary Vascularity in Heart Disease
iii) Pulmonary Arterial hypertension/ Its Imaging
iv) MR in Pulmonary Vascular Abnormalities .

3.7 Cadiomyopathy, Cardio Tumors, Trauma
3.8 The Imaging of Prosthetic Cardiac .Valves
3.9 The pericardium
3.10 Thoracic Aorta

IV .THE GASTROINTESTINAL TRACT:

The Esophagus
1 Anatomy .and Functions
2 Methods of Examination
3 Pathologies of Esophagus
4 Motility Disorders
5 Extrinsic lesions/ miscellaneous conditions

The stomach
1 Radiological anatomy and methods of examination
2 Inflammatory Diseases
3 Neoplastic Conditions
4 Radionuclide Studies in Stomach

The Duodenum
1 Anatomy and Normal Appearances
2 Methods of Radiological Examination
3 Peptic ulceration
4 Gastro heterotopia /diverticula
5 Neoplasms benign and malignant

The Small Intestine
1 Anatomy and normal appearances
2 Methods of radiological examination
3 Crohns disease/Coeliac Disease/Neoplasms/various conditions

The Large Bowel
1 Anatomy and Normal Appearances
2 Methods of Radiological Examination
3 Tumors
4 Diverticular Disease
5 Colitis
6 Aids
7 Miscellaneous Conditions

Peritoneum, Mesentery and Omentum
1 Peritoneal spaces and reflections
2 Abnormalities of Peritoneum
3 Abnormalities of Mesentry
4 Abnormalities of greater Omentum

Gastrointestinal Angiography.
1 General Consideration
2 Gastro intestinal bleeding

Interventional Radiology in Gastrointestinal tract

1 Introduction
2 Esophagus
.3 Stomach and Duodenum
4 Small Intestine
5 Colon and Rectum

Pediatric Gastrointestinal Radiology

1 The Neonate
2 The Infant and Older Child

V. Liver, Biliary tract, Pancreas, Endocrine System and Lymphoma

Liver

1 Normal and variant Anatomy
2 Liver Imaging Techniques
3 Diffuse Disease
4 Focal Disease
5 Intervention

The Biliary Tract

1 Anatomic Consideration
2 Methods of investigation
3 Biliary Disorders

Interventional Techniques Hepatobiliary System

1 Liver Biopsy
2 Biliary Obstruction
3 Malignant Biliary Obstruction
4 Percutaneous Cholangiography and Biliary Drainage Procedures
5 Vascular Interventional Techniques in Hepatobiliry System

The Pancreas

1 Embryology and Anatomy
2 Congenital Anomalies
3 Multisystem Diseases with Pancreatic involvement
4 Pancreatitis
5 Pancreatic Neoplasms
6 Trauma
7 Interventional Radiology in Pancreas

Imaging of the Endocrine System :

1 Hypothalamic-Pituitary Axis
2 Pineal Gland
3 Thyroid Gland
4 Parathyroid Gland
5 Pancreatic & Gastrointestinal Endocrine Disorders
6 Carcinoid Tumors
7 Adrenal Glands
8 Female Reproductive System .
9 Male Reproductive System

Reticuloendothelial Disorders : Lymphoma

1 Epidermilogy
2 Histopathological Classification
3 Staging Investigation and Management
4 Extranodal Manifestation of Lymphoma
5 Monitoring response to therapy

Reticuloendothenial Disorders: The Spleen

1 Imaging Techniques
2 Normal Anatomy
3 Splenomegaly
4 Benign Mass Lesions
5 Malignant Mass Lesions
6 Splenic Trauma

VI Genito Urinary Tract :

6.1 Methods of Investigation :

6.2 Radionuclide Imaging in Genito Urinary Tract :

6.3 Urodynamics

6.4 Reno Vascular Disease:

6.4.1 Renal Arteriography
6.4.2 Vascular Abnormalities
6.4.3 Radiological Management of Reno Vascular Disease

6.5 Renal Parenchymal Disease

6.5.1 Normal Appearance
6.5.2 Renal Parenchymal Disease
6.5.3 Parasitic Infections

6.6 Renal Masses :

6.6.1 Methods of Analysis
6.6.2 Pathological Renal Masses
6.3 Neoplastic Renal Masses

6.7 Calculus Disease & Urothelial Lesions

6.7.1 Calculus Disease
6.7.2 Nephrocalcinosis
6.7.3 Urothelial Tumors

6.8 Urinary Obstruction:

6.8.1 Pathophysiology
6.8.2 Causes of Obstruction

6.9 Radiological Evaluation of Urinary Bladder, Prostrate & Urethra :

6.10 Injuries to the Genito Urinary Tract :

6.11 Renal Failure and Transplantation :

6.12 Interventional Uroradiology :

6.13 Imaging of the Kidneys & Urinary Tract in Children

6.13.1 Embryology
6.13.2 Techniques .
6.13.3 Interventional Procedure "

6.14 Imaging of Paediatric Pelvis :

6.14.1 Imaging Techniques ;
6.14.2 Normal Anatomy
6.14.3 Congenital Anomalies
6.14.4 Pelvis Masses
6.14.5 Scrotal Disease

VII Skeletal System :
7.1 Skeletal Trauma
7.2 Bone Tumors : Generals Characteristic & Benign Lesions
7.3 Bone Tumors : Malignant Lesions
7.4 Myelproliferative and Similar Disorders
7.4.1 Generalised/Localised Decreased in Bone Density
7.4.2 Generalised/Localised Increased in Bone Density
7.4.3 Delayed Skeletal Matuarity
7.5 Metabolic and Endocrine Disease of the Skeletal
7.6 Skeletal Dysplasias and Malformation Syndrome
7.7 Joints Diseases :
7.7.1 Rhumatiod Arthritis
7.7.2 Other Connective Tissue Disease
7.7.3 Crystal Deposition Arthropathy
7.7.4 Degenerative Joint Disorders/Degenerative spine
7.7.5 Arthrography/ HPOA/ Pachy Dermoperiostritis
7.8 Bone and Soft tissue Infection :
7.9 Imaging of Soft tissue :
7.10 Bone Tumors in Children :
7.10.1 Imaging approach
7.10.2 Benign Bone Tumors
7.10.3 Malignant Bone Tumors
7.11 The Radiology of Non Accidental Injry in Children :
7.12 Paediatric Musculo -Skeletal Trauma
7.13 Radiology of Arthritides in Children
7.14 Radiology of Soft tissue in Children
7.15 Bone and Soft tissue infection in Children.
VIII. The Reproductive System :
8.1 Ultrasound in Obstetrics and Gynaecology
8.1.1 Indication
8.1.2 Instrumentation in US Techniques
8.1.3 Gynecological infertility
8.1.4 Assesing Tubal Patency
8.2 Imaging in Gynaecology
8.3 Hysterosalpingography
8.4 The Breast & its Imaging
8.5 Breast Cancer
8.6 Male Reproductive System
IX Central Nerve System :
9.1 Skull and Brain : Methods of Examination and Anatomy
9.2 Cranial and Intracranial Pathology : Tumors in Adults
Cerebro Vascular Disease and Non Traumatic
Intracranial Haemorrhage
Infections, AIDS, Demyelinating and Metabolic
Disease
9.3 Spine: Method of Investigation
9.4 Imaging of Spinal Pathology
9.5 Scoliosis in Children
9.6 Neonatal Head and Spine Sonography
9.7 Neurology in Children

X. The Orbit; ENT; Face; Teeth:

10.1. The Orbit

10.1.1 Anatomy / Techniques
10.1.2 Intraoccular Abnormalities
10.1.3 Lacrimal Gland Tumors
10.1.4 Muscular Tumors
10.1.5 Intra/Extra Canal Tumors

10.2 Ear, Nose and Throat Radiology

10.2.1 The Ear
10.2.2 Nose and Paranasal Sinuses
10.2.3 Phrynx

10.3. Maxillofacial Radiology

10.3.1 Fractures of Maxilla
10.3.2 TM Joint
10.3.3 Salivary Glands

10.4. Dental Radiology

10.5. Pediatrics, Eye & Orbit :

10.5.1 Imaging Techniques
10.5.2 Child with Proptosis or an Orbital mass
10.5.3 Child with Orbital Infection
10.5.4 .Child with White Eye
10.5.5 Child with Development Abnormalities

10.6. Paediatric ENT Imaging

XI) Interventional radiology:

1. HSG & FTR
2. 4 vessel angiography
3. Biliary intervention(PTBD,PTC)
4. PCN
5. Laser ablation of varicose veins
6. RFA/ chemoembolisation of hepatic tumour and malformations.
7. Vertebroplasty.
8. Hemangioma and AVM management.

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

BOARD OF STUDIES MEDICAL FACULTY(P.G.EDUCATION)
MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES
NASHIK-422004.

GOAL

1. **To develop competent specialist and medical teachers who can appreciate health needs of the community, perform professional obligations observing ethics and keeping in view the objectives of national health policy at various levels of health care delivery system as well as be aware of contemporary and recent developments in the concerned discipline and updating with latest advances.**

A) General suggestions .

i) Uniform nomenclature – it is unanimously decided that the nomenclature of Post graduate degree and diploma should be broad based. (either Respiratory Medicine / Pulmonary Medicine) eg. MD (Branch V) Respiratory Medicine,
Diploma in Respiratory Medicine (DRD) or Diploma in Pulmonary Medicine.

ii) Duration -PG Diploma should be of two years duration & PG degree should be of three years duration

iii) Affiliation- The department of a Medical College / Institution should be affiliated. It should be confirmed/ approved and then the teacher functioning in approved department should be recognized.

a. Criteria for affiliation-

- Institution should be first affiliated to university as per laid down norms under 11.2 minimum requirements for PG institution (M.C.I).
- Department on clinical side should have:

1. No. of units – (at least one)

2. Teaching component – teacher should posses the qualifications and experience prescribed by Medical Council of India

Total teaching experience in the subject of 8 years for which recognition is sought out of which at least five years as lecturer or Asst. Prof.

a) HOD Professor (preferably either recognized or eligible to be recognized for PG teacher ship)

b) Unit head – Prof./ Addl. Prof / Asso. Prof. (preferably either recognized or eligible to be recognized for PG teacher ship) if there is one unit it should be headed by Professor only but second or subsequent additional unit may be headed by either Prof ./ Addl. Prof/ Asso. Prof.

c) Other faculty – at least one more qualified teaching faculty (preferably either recognized or eligible to be recognized for PG teacher ship)

Any PG teacher can simultaneously be recognized for MD and PG diploma and can enroll students for both. In addition their teachership should be accorded permission for DNB (National Board of examinations) , Diploma / fellowship of college of Physicians and Surgeons Mumbai, along with certification / fellowship courses that are likely to be started by MUHS in the light of paucity of registration available for Maharashtra State students.

d) Bed strength – minimum 30 sanctioned beds in an indoor unit (at least one unit) For MD / MS and minimum 20 sanctioned beds in an indoor unit for PG Diploma if recognition is for both MD & PG Diploma minimum 30 sanctioned beds in an indoor unit (at least one unit) required.

e) Residents – minimum one resident per 10 beds- (3-residents per 30 beded unit) They are name as Junior Residents for broad specialty JR I (first year) JR II (second year) JR III (third year) Fourth year residency may be adopted to complete three years teaching experience to fulfill eligibility criteria for lecturer post. This post should only be given to PG degree qualified resident.

One teaching unit should have minimum two qualified teaching faculty (preferably either recognized or eligible to be recognized for PG teacher ship)

f) Other staff :

In addition to teaching faculty staff the strength of technical paramedical staff shall be as per the staff strength prescribed for admitting 50 – 100 – 150 or multiple of 100 MBBS admissions regulations

G. Enrolment :

Each PG teacher can enroll only one student for MD / MS per year and one PG Diploma students per year.

4) Laboratory facilities:

a) Central Lab facilities -for training Postgraduate students should be available preferably computerized automatic analytic type equipments be available.Central Direct microscopy, Fluorescent microscopy, Culture & Susceptibility for organism inclusive of AFB be available

b) Equipments -should be functional throughout the year quality control and accuracy be monitor periodically. The facilities should be updated in lieu of the advancement in knowledge, technology and research.

c) Central Biomedical waste management is mandatory.

5) Radiology :

Conventional, Ultrasound, Spiral CT/ Multislice CT, MRI, 2D Echo, Colored venous and arterial Doppler, CT guided Biopsy are few of the facilities that should be available. Further as per the advancement in our knowledge the facilities should be updated.

Department as well as Central **Medical Record Section** should be available (preferably computerized).

6)Library:

Department as well as Central medical library in possession of standard text books, index journals, year books, recent advances periodical should be available.

At least central Library should have PC's with colored laser printer, Internet facilities, Fax, Xeroxing machine along with educational CD's.

7) Equipments:

Each unit of the department should have clinical/ procedure room with facilities for pleural tapping and biopsy, FNAB, Pulse oximeter, multifunction bed, trolleys, with at least four X-ray and scanplate mountable viewing box, four to five nebulizers.

a)Pulmonary Function Laboratory having facilities to perform spiormetry, Airways resistance and conductance, diffusion study, Bronchial challenge test, allergy-testing facility with emergency management arrangement, six minutes walk work test facilities.

b)Bronchoscopy room having flexible fibroptic bronchoscope, with standard accessories, leakage tester, monitor , CCTV camera, recording facilities, nebulizer scope sterilization tray central cupboard to hang the scope with punch biopsy, brush biopsy, channel cleaning forceps, suction and oxygen ports or portable machine and cylinder.

c)Respiratory critical care/ high dependency ward: to take care of seriously/ critically ill patients. Preferably at least four bedded ward having facilities of centralized oxygen and suctioning Non – invasive/ invasive ventilators and different types of masks and oxygen canulae. If departmental critical center is not available hospitals central intensive care unit must be available with easy access to the patient from the department.

d) Sleep Laboratory:

1. Polysomnography machine with adequate channels, SPO2 measurement having facilities for up gradation
2. Monitoring treatment modality with unilevel / bilevel positive airway pressure equipment.
3. Separate room with proper ventilation

CURRICULUM
(syllabus)
BASIC SCIENCES

I - ANATOMY OF THE LUNG & DEVELOPMENT & GENETICS OF LUNG DISEASES.

II - PHYSIOLOGY :

- Respiratory Mechanics
- Physiology of Respiration & Ventilation.
- Physiological basis of pulmonary function testing & arterial blood gases.
- Acid based disturbances
- Physiology aspects related to mechanical ventilation
- Physiology related to endocrine aspects of lung
- Sleep physiology
- Patho-physiology of all disorders pertaining to pulmonary medicine.

III - PUBLIC HEALTH & EPIDEMIOLOGY:

- Epidemiological aspects of major respiratory and public health problems like tuberculosis, asthma, interstitial lung disease & occupational & environmental disorders.

IV - PULMONARY REHABILATION

V -SURGICAL ASPECTS;

- Surgical interventions in various pulmonary disorders including trauma, infections & lung transplantation & minimally invasive interventions.

VI- MEDICO-LEGAL ASPECTS:

- Principles of care for patient requiring mechanical ventilation.
- Long term oxygen therapy
- Compensation (occupational lung disorders)
- Fitness & disability evaluation.
- Personal Protective measures for occupational health, biosafety guidelines for medical equipment & waste disposal.
- Human Rights, ethical aspects, consent for procedures/newer drug development. Aspects related to medical procedures & interventions performed in various pulmonary disorders.

VII- RECENT ADVANCES :

- Drug development in respiratory medicine.
- Sleep Medicine
- Invasive diagnostic techniques
- Lung in extreme conditions.

VIII- INFECTIONS :

- Tuberculosis (pulmonary & extrapulmonary)
- Opportunistic infections related to immunocompromised state & other infections in immunocompetent individuals.
- Infections related to systemic illnesses

IX - ENVIRONMENTAL MEDICINE RELATED TO PULMONARY MEDICINE WITH SPECIAL REFERENCE TO AIR POLLUTION & OCCUPATIONAL DISEASES.

X - PULMONARY CRITICAL CARE ASPECTS :

XI -CONVENTIONAL CHEST RADIOLOGY & LUNG IMAGING

XII - PULMONARY CIRCULATORY DISORDERS.

XIII - DISEASES OF AIRWAYS

XIV - NEOPLASTIC DISEASES

XV - DISEASES OF MEDIASTINUM

XVI - INTERSTITIAL LUNG DISEASE

XVII - PULMONARY INFECTIONS.

XVIII - PROBLEM BASED LEARNING FOR THEORY & PRACTICAL ON EACH ASPECT (REFERENCE : W.H.O.) :

- Cause of the complaint
- Ways to differentiate between possible causes
- Pathophysiological mechanisms responsible for the complaint and clinical conditions.
- Best possible management strategies.
- Prevention of recurrence.

In addition to the above-cited syllabus a student should acquire theoretical knowledge, dissertation, clinical and communication skills as well as training in research methodology.

B) Recognition of textbooks, reference books & journals

a) **Text Books**:
Respiratory Diseases (I & II) - Crofton & Douglas
Pulmonary Diseases & Disorders - A. Fishman
Diseases of Chest (I,II,III &IV) - Fraser & Pare

b) **Reference books:**
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
High Resolution CT of the Lung - W. Richard Webb
Surgical Aspects of Tuberculosis - Gibbons
Tuberculosis - Toman

c)**Journals:**
Thorax
American Review of Critical Care & Respiratory Diseases.
Indian Journal of Chest Diseases
European Journal of Respiratory Diseases.
Clinics in Chest Medicine.
Recent Advances in Respiratory Medicine.

C) Pattern of P.G.Degree and Diploma Examinations

(As per Direction No. 01/2008 dtd. 26/05/2008)

Appointment of examiners:

a. There will be two internal examiners and two external examiners (from out of state).

b. If the total number of the candidates are more than 39 then instead of four eight examiners four internal & four external can be appointed.

c.In the event of more than eight candidates the practical examination should be held for more than one day depending upon the number of candidates in the multiples of eight.

d.If a corum of four / eight examiners is not completed than the external examiners can be appointed from the existing list however at no point of time both external examiners will be retired internal examiners empanelled as externals.

e. In case of crisis examination can be carried out with minimum of three examiners of which at least one should be an external examiner with prior permission of M.C.I.

f.. An internal examiner ordinarily be appointed for not more than two terms in succession or with in two years at any turn of the college.

g.examination of MD/ MS and PG diploma can be held in Jan & July Each year .

h. For PG degree and diploma four examiners are to be appointed and the same set of examiners can conduct both MD/ MS and PG diploma in there respective term to void duplication and extra expenses thereof.

i.Same set of examiners should assess dissertations, theory and practical of all the candidates appearing for the same examination.

J.PG students only should be allowed to appear for examination on passing assessment of dissertations by the respective set of examiners.

k.There will be chairman/ convener who is supposed to moderate paper setting and practical examination, submission of result to the university. Such person should essentially be an internal examiner and who will officiate for only one term at the time and not more than one in succession.

SYLLABUS FOR DIPLOMA AND M.S. DEGREE IN ENT-HNS (OTOLARYNGOLOGY AND HEAD NECK SURGERY)

BASIC SCIENCES: -

1. Anatomy, Ultrastructure of Human Ear.
2. Physiology of Hearing.
3. Physiology of Equilibrium.
4. Anatomy of the Nose & Paranasal sinuses.
5. Physiology of Nose & Paranasal sinuses.
6. Pathophysiology of Ear & Paranasal sinuses in Flight and Diving.
7. Mouth & Related Facio-Maxillary Structure.
8. Anatomy & Physiology of Salivary Glands.
9. Anatomy of Pharynx & Esophagus
10. Physiology of Deglutition.
11. Anatomy of Tracheobronchial tree.
12. Physiology of Respiration.
13. Anatomy of Thyroid & Parathyroid Glands.
14. Physiology of Thyroid & Parathyroid Glands.
15. Physiology & Reception of Speech.
16. Surgical Anatomy of Skull Base.
17. Clinical Neuro-Anatomy.
18. Imaging & Radiology.
19. Basic Immunology.
20. Microbiology related to ENT & HEAD, NECK Diseases.
21. Cell Biology.
22. Principles of Radiotherapy in Head & Neck Cancer.
23. Principles of Chemotherapy in Head & Neck Cancer.
24. Principles & Use of Nuclear Medicine.

25. Wound Healing.
26. Principles of Laser Surgery.
27. Intensive & High Dependency Care.
28. Anaesthesia in ENT & HEAD, NECK Surgery.
29. Biomaterials.
30. Medical Negligence in Otorhinolaryngology.

OTOLOGY: -

1. Examination of Ear.
2. Aetiopathology of Inflammatory Conditions of External & Middle Ear
3. Pathology of Cochlea.
4. Pathology of Vestibular System.
5. Diseases of External Ear.
6. Ear Trauma.
7. Plastic Surgery of the Ear.
8. Acute Suppurative Otitis Media.
9. Management of Acute Suppurative Otitis Media
10. Chronic Suppurative Otitis Media.
11. Management of Chronic Suppurative Otitis Media.
12. Reconstruction of the Ear.
13. Complication of Suppurative Otitis Media.
14. Otalgia.
15. Otosclerosis.
16. Diseases of Temporal Bone.
17. Sensorineural Hearing Loss.
18. Sudden & Fluctuant Sensorineural Hearing Loss.
19. Vertigo.
20. Meniere's Disease.
21. Ototoxicity.
22. Vestibular Schwannoma.
23. Epithelial Tumours of External Auditory Meatus.
24. Glomus & Other Tumours of the Ear.
25. Disorders of Facial Nerve.

26. Surgery of the Vestibular System.

27. Cochlear Implants.

28. Presbycusis.

29. Implantable Hearing Devices.

RHINOLOGY: -

1. Examination of Nose.
2. Conditions of the External Nose.
3. Congenital Anomalies of the Nose.
4. Evaluation of the Nasal Airway & Nasal Challenge.
5. Abnormalities of Smell.
6. Mechanism & Treatment of Allergic Rhinitis.
7. Food Allergy & Intolerance.
8. Infective Rhinitis & Sinusitis.
9. Intrinsic Rhinitis.
10. Nasal Polyps.
11. The Nasal Septum.
12. Surgical Management of Sinusitis.
13. Complications of Sinusitis.
14. Cerebrospinal Fluid Rhinorrhoea.
15. The Upper Airways & their relation to the respiratory System.
16. Fracture of Facial Skeleton.
17. Rhinoplasty.
18. Epistaxis.
19. Snoring & Sleep Apnoea.
20. Non-Healing Granulomas.
21. Facial pain & Headache.
22. Aspects of Dental Surgery for Otorhinolaryngology.
23. Trans-Sphenoidal Hypophysectomy.
24. The Orbit.
25. Neoplasms of Nose & Paranasal sinuses.

LARYNGOLOGY & HEAD, NECK

1. Examination & Endoscopy of the Upper Aerodigestive Tract.
2. Oral Cavity.
3. Acute & Chronic Infections of Pharynx & Tonsils.
4. Acute & Chronic Laryngitis.
5. Disorders of Voice.
6. Management of Obstructed Airway & Tracheostomy.
7. Trauma & Stenosis of Larynx.
8. Neurological Affections of Larynx & Pharynx.
9. Pharyngeal Pouches.
10. Tumours of the Larynx.
11. Angiofibroma.
12. Nasopharynx (the postnasal space).
13. Tumours of Oropharynx & Lymphomas of the head & Neck
14. Benign Diseases of Neck.
15. Malignant neck Diseases;
16. The Thyroid & Parathyroid Gland.
17. Non-neoplastic Salivary Gland Diseases.
18. Benign Salivary Gland Tumours.
19. Malignant Salivary Gland Tumours.
20. Tumours of Infratemporal fossa & Parapharyngeal space.
21. Cysts, Granulomas & Tumours of the Jaw, Nose & Sinuses.
22. The Esophagus in Otolaryngology.
23. Facial Plastic Surgery.
24. Plastic & Reconstructive Surgery of the head & neck.
25. Terminal Care of Patients with head & neck Cancer.

AUDIOLOGY: -

1. Acoustics.
2. Computers in Audiology.
3. Epidemiology.
4. Otological Symptoms & Emotional Disturbances.
5. Clinical tests of Hearing & Balance.
6. Pharmacological Treatment of Hearing & Balance Disorders.
7. Legal & Ethical Matters.
8. Prevention of Hearing & Balance Disorders.
9. Hearing Overview.
10. Causes of Hearing Disorders.
11. Noise & the Ear.
12. Diagnostic Audiometry.
13. Audiological Rehabilitation.
14. Hearing Aids.
15. Cochlear Implants.
16. Tactile Aids.
17. Central Auditory Dysfunction.
18. Tinnitus.
19. Overview of Balance.
20. Causes of Balance Disorders.
21. Diagnostic Testing of Vestibular System.
22. Rehabilitation of Balance Disorders.

PAEDIATRIC OTOLARYNGOLOGY: -

1. Improving Paediatric Otolaryngological Consultation.
2. Genetic Factors & Deafness.
3. The Causes of Deafness.
4. Testing Hearing in Children.
5. Screening & Surveillance for Hearing Impairment in Preschool Children.
6. Otitis Media with Effusion.
7. Acute Suppurative Otitis Media in Children.
8. Chronic Suppurative Otitis Media in Children.
9. Surgery of Congenital Abnormalities of the External & Middle Ear.
10. Management of Hearing Impaired Child.
11. Cochlear Implantation in Children.
12. Vestibular Disorders in Children.
13. Speech & Language.
14. Foreign Bodies in the Ear & Nose.
15. Congenital Anomalies of the Nose.
16. Craniofacial Anomalies.
17. Nasal Obstruction & Rhinorrhoea in Infants & Children.
18. Tonsils & Adenoids.
19. Dental development, Orthodontics, Cleft lip& Cleft palate.
20. Sleep Apnoea.
21. Stertor & Stridor.
22. Congenital Disorders of Larynx, Trachea & Bronchi.
23. Stenosis of Larynx.
24. Acute Laryngeal Infections.
25. Foreign Bodies in Larynx & Trachea.

26. Tracheostomy & Decannulation.

27. Home care of Tracheostomised Child.

28. Neonatal Pulmonary Disorders.

29. Diseases of the Esophagus in Children.

30. Branchial cleft Anomalies, Thyroglossal cysts & Fistulae.

31. Tumours of the Head & Neck in Children.

32. Salivary Glands Disorders in Children.

33. The Drooling Child.

34. Recurrent Respiratory Papillomatosis.

35. Paediatric Anesthesia.

DISSERTATION

1. The dissertation is compulsory for the candidates registered for M.S. (ENT-HNS) and should include candidates own work under a supervisor qualified for the purpose and recognized as a postgraduate teacher by the university.
2. The subject of thesis along with a synopsis (about 200 words in the prescribed proforma) should be countersigned by the postgraduate teacher, head of the department and head of the institution. It should be submitted to the university within four months of registration as postgraduate student. No change in the dissertation topic or guide shall be made without prior approval of university.
3. The dissertation should be submitted under the following headings:

I. Introduction

II. Aims and objectives of the study

III. Review of literature

IV. Materials & methods

V. Observations

VI. Results

VII. Discussion

VIII. Conclusion

IX. Summary

X. Master chart

XI. References

4. If a work required for the thesis entails collaboration with other department or specialties, the collaborative portion of work will be supervised by a co-guides designated by the head of the institution .A co-guide should normally be a post graduate teacher in his own specialty, however, workers who have specialized in a particular field may be designated as co-guides by the Head of the institution. In cases where there is guide and co-guide for a thesis, the certificate required for submission of the thesis should be signed both guide and co-guide.

5. The subject of the thesis should as far as possible reflect the research priorities of the postgraduate department where the work is being done. The department should provide all facilities to the candidate and the candidate should not be asked to spend money on chemicals instruments etc. The Dean, Commandant/Principal of the college while submitting the topic of the thesis to the university for approval should make sure that the institution provides all facilities for the research work The candidate should submit to the university six monthly progress report of thesis and his other postgraduate work through his Post-Graduate teacher, Head of the post graduate department and Head of institution.

6. If the progress of the candidate's work including thesis work is not satisfactory, the university on recommendation of the Head of the department, head of the institution and Dean of the faculty of medicine may not grant the particular term and the period of training will be extended by the number of terms not granted.

7. If there is a minor change in the topic of dissertation the same be allowed at any time However if there is major change the student may allowed to change without keeping additional terms provided there is an interval of three clear terms between the date of application and date of examination

8. Lectures, Seminars, Journal club etc: The Post-graduate departments will organize lectures, seminars, symposia, tutorials, journal clubs, grand rounds and clinical meetings to keep the student abreast with the latest developments in the subject and ensure active participation by all PG students. 80% attendance is mandatory in these activities for grant of terms.

9. Log Book: Each PG student shall maintain a logbook of all academic activities, surgeries assisted and performed independently on a monthly basis. This logbook shall be signed by the Guide and Head of the department with their remarks on the progress of the student. This Logbook shall be produced at the time of Final Practical Examination as a record of academic and surgical work performed by the student over his training period.

SCHEME OF EXAMINATION

(As per Direction No. 01/2008 dtd. 26/05/2008)

RECOMMENDED BOOKS: -

1. Scott-Browns Otolaryngology.
2. Paparella Otolaryngology.
3. Shambaugh/Glasscock - Surgery of Ear.
4. Logan & Turner Diseases of ENT.
5. Ballenger Snow Otolaryngology.
6. Diseases of the Head & Neck by Cummins
7. Surgery of the Head & Neck – Stell & Maran
8. Rob & Smith Operative ENT Surgery.
9. Lore — Operative ENT Surgery.

RECOMMENDED JOURNALS: -

1. Indian Journal of Otolaryngology and Head neck Surgery.
2. Otology & Neurotology
3. Journal of Laryngology & Otology
4. Laryngoscope.
5. Annals of Otorhinolaryngology.
6. Archives of Otorhinolaryngology.
7. Otolaryngology Clinics of North America.

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

The Curriculum

Goals

The goals of postgraduate training course in Surgery would be to train a MBBS doctor who will Practice surgery efficiently and effectively backed by scientific knowledge and skill .
No syllabus can be comprehensive but the following topics are not intended to be prescriptive but it is a guide to the topics which need to be covered during training.
At the end of the training and evaluation,

• He will develop right attitudinal skills which will ensure effective and correct communication with patients, relatives, colleagues and superiors
• Continue to develop keen interest in continuing surgical education irrespective of whether he is in a teaching institution or is in Private practice
• Be a motivated 'teacher' - defined as a surgeon keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives of the Course

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The objectives may be considered under the subheadings

1. **Knowledge (Cognitive domain):** Knowledge and information about the subject, Recall of and Analysis of available information to be used for the treatment of patients.
2. **Skills (Psycho motor domain)**: The correct skills to be developed by working in a dry lab as well as surgeries on animals (Minimal access Surgery). He/She should develop surgical skills by assisting seniors as well as being assisted by seniors
3. **Human values**: Ethics involved in Surgical practice

At the end of the training, the candidate must be able to:

Knowledge:

• Describe etiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
• The candidate should be conversant with Homeostatic mechanism and Fluid Electrolyte balance and replacement therapy including blood transfusion, plasma expanders and treatment of various types of shock.

• Nutrition : Assessment, Management of parenteral and enteral nutrition

•Disorders of coagulation pertaining to surgeries, DVT , Thrombophilia

• Describe common malignancies in the country and their management

• Recognize conditions that may be outside the area of his specialty / competence and appropriate referral to specialist

• Advise regarding the operative or non-operative management of the case and to carry out this management effectively.

• Update himself by self-study and by attending courses, conferences and seminars relevant to surgery.

• Teach and guide his team, colleagues and other students.

• Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific forums.

Skills

• Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.

• Perform *minor* operative procedures and common general surgical operations independently and the *major* procedures with help from a senior surgeon.

• provide basic and advanced life saving support services (BLS & ALS) in emergency situations

• manage acute abdominal emergencies and poly trauma.

• Undertake thorough wound management, including burn wounds.

• Undertake complete patient monitoring including the preoperative and post operative care of the patient.

•Use of antibiotics in Surgery, Surgical infections' & use of Prophylactic antibiotics

Human values, Ethical practice and Communication abilities

• Adopt ethical principles in all aspects of his surgical practice. Professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.

• Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.

• Provide leadership and get the best out of his team in a congenial working.atmosphere.

• Apply high moral and ethical standards while carrying out human or animal research.

• Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.

• Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

Essential Knowledge

A list of objectives related to knowledge and higher cognitive abilities that are expected to be achieved during the course is given. The course contents have been identified and categorized as essential knowledge as under. This is to enable the student to achieve the objectives of the course. It is recognized that General surgery today mainly covers Gastrointestinal & Hepatobiliary disorders, basic urological problems, abdominal wall herniae, Breast & thyroid disorders, knowledge of some common problems in allied specialities. Further he should be familiar with complications, current controversies and recent advances in these topics.

The topics are considered under:

- Basic sciences,
- General Surgery topics and
- Specialty topics.

There will be an overlap between the General surgery and specialty categories.

Basic sciences include anatomy, physiology, biochemistry, microbiology and pathology and Radiology, as found in current text books. These standard topics are recommended to be studied as much as they are applicable to the practice of surgery.

General Surgery Topics include the following:

History of surgery

Clinical History and examination - detailed systematic history taking, clinical examination of various systems, coming to a provisional working diagnosis.

Rationale of diagnostic tests - Ordering diagnostic tests with prioritizing the needs,based on the clinical, hospital and the patient's socioeconomic condition

Informed consent / Medico legal issues - Understanding the implications of acts of omission and commission in practice. Issues regarding Consumer Protection Act. - Implications in a medico-legal case like accidents, assaults etc.

Concept of Essential Drugs and Rational use of drugs

Pharmacoeconomics

Surgical audit - Understanding the audit of process and outcome. Methods adopted for the same.

Basic statistics

Evidence based medicine - Understanding journal based literature study;
the value of text book, reference book articles; value of review articles; original articles and their critical assessment. Understanding the value of retrospective, prospective, randomized controlled and blinded studies. - Understanding the principles and meanings various biostatistical tests applied in these studies.

Use of computers in surgery: Retrieval of important information, Record keeping, Powerpoint presentations for teaching, Statistical methods

Preoperative evaluation of patients with Co-morbid conditions

Principles of operative surgery like asepsis, antisepsis, sterilization. Basic surgical techniques; properties of suture materials; appropriate use of sutures, drains, prosthetic grafts. Postoperative care - concept of recovery room care; airway management; assessment of wakefulness; management of cardiovascular instability in this period. Post operative pain management as well as care of terminally ill patients especially cancer patient. Basic surgical instrumentation - Principles of surgical instrumentation; their maintenance and troubleshooting. Familiarize with minimal access surgery instruments, Diathermy & lasers.

Wound management: wound healing; factors influencing healing;
Assessment of trauma; Assessment of head, chest and abdominal trauma and triage - Assessment of a trauma victim; resuscitation; care at the site; triage; care in the accident department; criteria for immediate surgery; immediate workup and logical referral criteria. Multiple injured patient, closed abdominal and chest injuries, penetrating injuries; fractures pelvis; urological injuries; vascular injuries; trauma scores.

Surgical infections - asepsis and antisepsis; microbiological principles; rational use of antibiotics; special infections like synergistic gangrene and diabetic foot infections. Hepatitis and AIDS

Surgical nutrition - nutritional assessment; metabolic response to stress; need for nutritional support; enteral nutrition; routes of access to GI tract; parenteral nutrition; access to central veins for nutritional support.

Acute abdomen - Appendicitis / Peritonitis / Perforated viscus / Intestinal obstruction

Hernias - simple and complicated - various types of hernias; their repair; prosthetic materials

Critical care - Cardiorespiratory failure - management of shock; including monitoring; sepsis scores; pharmacological support.

Fluid and electrolyte balance / Acid - Base metabolism - The body fluid Compartments; metabolism of water and electrolytes; factors maintaining homeostasis; causes for and treatment of acidosis and alkalosis.

Pain control - acute and chronic pain; cancer and non-cancer pain; patient controlled analgesia.

Principles of oncology - cell kinetics; causation of tumours; principles of oncologic surgery, radiotherapy and chemotherapy; paraneoplastic syndromes; cancer pain management; palliative care

Principles of burn management - types of thermal injury; assessment of extent; immediate management; late management; skin cover; rehabilitation

Principles of fracture management - fracture healing; principles of immobilization; complications; principles of internal fixation.

Airway obstruction / management - anatomy of the airway; principles of keeping the airway patent; mouth to mouth resuscitation; oropharyngeal airway; endotracheal intubation; crico-thyroidetomy; tracheostomy.

Breast disease - benign and malignant disease; diagnosis; investigation; screening for cancer; genetics of breast cancer

Thyroid disease - solitary nodule; investigations; multinodular goiter; Hashimoto's disease; cancer

Specialty Topics Include

GI endoscopy and Laparoscopy:

Principles of GI endoscopy

Diagnostic and therapeutic GI endoscopy including upper GI, lower GI and pancreato-biliary systems.

Physiology of pneumoperitoneum. Diagnostic laparoscopy & Laparoscopic therapeutic procedures

Neurosurgery :

Head and neck trauma; acute management and rehabilitation

Concept of brain death / medico-legal implications

Peripheral nerve injuries

Neoplasms of the brain and meninges

Acute and chronic infections of the brain and meninges

Hydrocephalus

Spinal injuries

Monitoring intracranial tension

Urology:

Urological injuries

Urothelial tumours / Chemotherapy

Prostatic hypertrophy

Hypospadias

Pyelonephritis / perinephric abscess

GU tuberculosis

Scrotal disease

Endourology

Peritoneal dialysis / CAPD / haemodialysis

Transplantation / harvesting kidney

Urinary diversion

Infertility / Vasectomy

Pyeloplasty / hydronephrosis

Oncology:

Breast, thyroid and GI malignancies

Chemotherapy / Adjuvant therapy

Head and neck tumours

Imaging CT/ MRI CT guided FNAB/C

Post excision reconstruction

Radiotherapy

Plastic Surgery

Burns management

Cleft lip and palate

Congenital defects of hand

Details of skin flap

Facial injuries

Hand injuries / tendon injury

Hypospadias

Nerve repair

Pressure sores .

Principles of microsurgery

Principles of tissue transfer

Vascular repair

Cardio-thoracic surgery

Flail chest / thoracic trauma Bronchogenic carcinoma Lobectomies

Pneumonectomy

Endocarditis prophylaxis

Pulmonary function tests

Control of major haemorrhage

Operations on the diaphragm

Coronary artery disease

Valvular heart disease

Lobectomies and pneumonectomies

Oesophageal disease

Operations on thoracic aorta

Mediastinal tumours

Basics of congenital heart disease

Vascular Surgery

Vascular imaging

A V malformations

Exposure of major arteries and veins / vascular anastamosis

Varicose veins

Chronic venous insufficiency.

Vascular emergencies - trauma, embolism

Peripheral vascular disease - Atherosclerosis, arteritis

Details of vascular prosthesis

Paediatric Surgery

Fluid and electrolyte management

Preparation for surgery / post op care

Hernias

Spinal fusion defects Ventral defects

Operative Skills:

Emergency Room Procedures

Application of Splints for Fractures
Arterial and Venous Lines
Assessment and initial management of Poly trauma
Cardiopulmonary Resuscitation
Management of Airway Obstruction
Management of Shock and Cardiac Respiratory failure

Pre-operative Workup

Ability for adequate pre-operative preparation in special situations like Diabetes, renal failure, cardiac and Respiratory failure etc. and risk Stratification
Communication skills with special reference to obtaining Informed Consent
Proper pre-operative assessment and preparation of patients including DVT prophylaxis, Blood transfusion and Antibiotics

Post-operative Care

Airway management
Basic Physiotherapy
Management of epidural analgesia
Management of Fistulae
Management of postoperative hypo and hypertension
Postoperative pain control
Skills for Nutritional rehabilitation of patients
Skills for proper Fluid & Antibiotic management
Stoma care

Minor O. T. procedures

Circumcision under Local Anesthesia
Drainage of Abscesses
FNAC
Major dressings
Minor Anorectal Procedures (Haemorrhoids -Banding, Cryotherapy, suturing etc.
Anal dilatation and Fissures), Fistulectomy
Minor Biopsies - Lymph node, ulcer, swellings etc.,
Reduction and plaster application of simple fractures and dislocations
Removal of simple subcutaneous swellings
Sigmoidoscopy and Upper OJ. endoscopy
Suturing Techniques
Vasectomy
Wound debridement

Major Operating room techniques

Instrument anangement and trolley layout
Skills in Sterilization techniques, O.T.Layout and Asepsis
Skin preparation - painting and draping
Technique of scrubbing and gowning

General Surgical Operative Procedures

Appendicectomy

Cholecystectomy

Closure of Colostomy

Closure of peptic ulcer / under-running bleeding ulcer / vagotomy drainage

Colostomy

Cysts and sinuses of the neck

Diagnostic laparoscopy

Drainage of breast abscess / Excision of breast lump

Groin Hernia repair

Gynaecomastia

Haemorrhoidectomy / Fissurectomy / simple fistulectomy

Hemicolectomy

Herniotomy / Orchidopexy in children

Laparotomy for abdominal trauma / splenectomy

Laparotomy for intestinal obstruction / bowel resections / bowel anastamosis Management of complex wounds

Mastectomy

Opening and closing the abdomen

Opening and closing the chest

Parotidectomy

Release of bands and simple adhesive obstruction

Thyroid lobectomy

UGI endoscopy / Flexible sigmoidoscopy

Ventilation

Wide excision of breast tumours / mastectomy / microdochectomy

Gastrostomy / Feeding jejunostomy

Speciality Procedures

There will be repetition of the procedures listed under this category and those listed under General surgical procedures.

Laparoscopy And GI Endoscopy

Diagnostic and therapeutic Upper and Lower GI endoscopy

Diagnostic laparoscopy

Diagnostic Upper GI endoscopy

Laparoscopic Cholecystectomy

Neurosurgery

Craniotomy
Management of paraplegia
Peripheral nerve repair
Treatment of nerve injury specific operations
Suturing complex scalp wounds
Trephining

Urology

Carcinoma penis
Diagnostic cystoscopy
Inguinal Block Dissection
Meatotomy
Nephrectomy - partial & total
Nephrolithotomy
Orchidectomy
Orchidopexy
Retroperitoneal lymph node dissection
Supra pubic cystostomy
Total amputation of penis
TURP / Open prostatectomy
Ureterolithotomy
Urethral J Urogenital injuries
Urethral dilatation
Varicocele
Vasectomy

Oncology

All radical operations - Breast, Thyroid, GI and Facio-maxillary malignancies
Breast lumpectomy
Functional neck node dissection
Gastrectomy / Bowel resection
Metastatic workup

Plastic Surgery

Burn resuscitation

Lip surgery

Local blocks in anaesthesia

Minor hand injuries

Nerve repair

Post excision reconstruction

Reimplantation of digits

Skin flap surgery

Stitch craft

Tendon repair PA

Wound debridement

Paediatric Surgery

Anorectal anomalies

Circumcision I meatoplasty

Herniotomy

Intercostal aspiration

Laparotomy for peritonitis

Lymph node biopsy

Non operative treatment of volvulus

Orchidopexy

Ostomies

Paediatric emergencies

pyloromyotomy

Cardiothoracic Surgery (Not essential)

Canulation of artery and vein

Chest injuries PA

Empyema drainage / decortication

Endotracheal intubation

Intercostal drainage

Lobectomies and pneumonectomies

Oesophageal surgery

Opening and closing the chest

Operations on the root of the neck

Pericardiectomy

Removal of FBs

Remove pulse generator (pacing)

Rib resection PA

Tracheos tom y

Undertake sternotomies

Vein and arterial harvesting

Ventilator management

Vascular Surgery

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student.He should be included in Residency program No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not remain absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below. Depending on the facilities available, any or all of these methods may be employed.

1.**Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a)Didactic Lectures: Recommended for selected common topics for post graduate students of all specialities. Few topics are suggested as examples:

1)Bio-statistics

2)Use of library

3)Research Methods

4)Medical code of Conduct and Medical Ethics

5)National Health and Disease Control Programmes

6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b)Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, eg Jaundice, Diabetes mellitus, Thyroid Topics to bs taken by Basic sciences specialist etc.

2.**Journal Club:** Recommended to be held once a fortnight All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least two times a year and a total of 6 presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A time table with names of the student and the moderator should be announced at the beginning of every year.

3.Subject Seminar: Recommended to be held once a month All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics ai least" four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry

weightage for internal assessment (See Checklist II of Internal Assessment). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4.Student Symposium: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5.Ward Rounds: Ward rounds may be service or teaching rounds.

a)Service Rounds: Postgraduate students and Interns should do ward rounds every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.

b)Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6.Clinico-Pathological Conference: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

7.Inter Departmental Meetings: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histochemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

8.Teaching Skills:: Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc.

Assessment is made using a checklist by surgery faculty as well students. Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.

9.**Continuing Medical Education Programmes** (CME) : At least 2 state level CME programmes should be attended by each student in 3years.

10.**Conferences:** Attending conferences is optional. However it should be encouraged.

11.**Dissertation** Every candidate pursuing MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

Rotation and posting in other departments

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However the recommended period and timing of training in basic subjects, allied departments and speciality departments are given below.

In the first year, during the morning session, student should work in the parent department. It is recommended that 2 years and 4 months be spent in General Surgery and 8 months in allied and specialty departments. Depending on the time and opportunities available, some of the procedures listed for second year activity can be shifted either to the first or the third year. Students must be 'on call' on a regular basis. The total duration of postings in core and other specialities will be eight months.

Basic Sciences

Basic science should be an essential part of training. It should be done as concurrent studies during the 1 st year of training. At least two hours daily may be in the first six months of the course.

In the afternoons basic science teaching relevant to surgery can be done in the respective departments.

Topics for study to include Anatomy, Physiology, Pathology, Microbiology, Pharmacology, Anaesthesia and Radiology

Pathology - Concurent study - Recommend daily Grossing sessions, weekly Surgical pathology sessions and monthly Clinico Pathological Conferences. Radiology - Concurrent study - adequate exposure to modern imaging modalities like ultrasound sonography, CT scan, MRI and angiography.

Allied Specialty Subjects

Students should to be posted to core allied speciality subjects Viz. Anaesthesia and ICU for one month and Orthopaedics including trauma (accident and emergency) for 2 months during the second year of training. Posting to the Department of Obstetrics and Gynaecology for one month is optional. This posting may be in lieu of one of the other specialties (except the core specialties) depending on the choice of the candidate.

Other Surgical Speciality Subjects

Postings to other speciality departments will be during the second year. The departments and duration of postings are as under:

Department	Duration
• Paediatric surgery	4wks
• Plastic surgery	4wks
• Urology	4 wks
• Oncology	4 wks
• Cardiothoracic surgery	2 wks
• Neurosurgery	2 wks

Dissertation

1.The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

2.Every candidate shall submit to University in the prescribed proforma, a synopsis containing particulars of proposed dissertation worK within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

3.Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

4.The dissertation should be written under the following headings:

1.. Introduction
11. Aims or Objectives of study
111. Review of Literature
IV. Material and Methods
V. Results
VI. Discussion
V11. Conclusion
V11l. Summary
IX. References
X. Tables
Xl. Annexure

5.The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other Checklists. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" X 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

6.Four copies of dissertation thus prepared shall be submitted to the University, six months before final examination on or before the dates notified by the University.

7.The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the Universityexamination.

8.**Guide:** The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work be as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognised as post
graduate teachers. A **Co-guide** may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/ training by the University /Medical Council of India. The co-guide shall be a
recognised post graduate teacher

9.**Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

Practical Examination:

(As per Direction No. 01/2008 dtd. 26/05/2008)

SYLLABUS FOR POST GRADUATE DEGREE IN OBST. & GYNAECOLOGY (M.D.)

OBSTETRICS :

1. Basic sciences

A) Applied Anatomy in females of genito urinary system, abdomen, pelvis, pelvic floor, anterior abdominal wall and breast.

B) Anatomy of fetus

C) Fundamentals of reproduction

Gametogensis fertilization, implantation & early development of human embryo.

Placenta - development, structure, functions

Amniotic fluid - formation and function

Fetal growth & development, fetal physiology

Birth defects,Genetics & teratology & counselling.

Physiological changes during pregnancy, labour and puerperium

Endocrinology of pregnancy.

Lactation

Immunology of pregnancy

Molecular biology

2. Normal pregnancy, labour & puerperium.

Breast feeding - baby friendly initiative

3. Early recognition and prompt management of pregnancy complications, - Hyperemesis gravidarum, abortions, ectopic pregnancy, hydatidiform mole,

Pre-eclampsia, eclampsia, Pathophysiology of PIH,

Antepartum hemorrhage, multiple pregnancy, polyhydramnios, Oligohydramnios &Prolonged pregnancy.

4. Management of pregnancies complicated by medical,surgical or gynaecological diseases, in consultation with the concerned specialities by team approach.

* Anemia,Heart disease,diabetes mellitus, liver disorders,Respiratory diseases, Renal diseases**,** CNS disorder, Skin, Psychiatry

Hypertensive disorders .

* Acute abdomen, Acute Appendicitis, Intestinal obstruction, perforations.

- Fibroids, Ovarian tumors, Carcinoma cervix, genital prolapse.
- Recent advances in medical and surgical management.

5. Infections in pregnancy.

Malaria, Toxoplasmosis, viral infections (Rubella, CMV, Hepatitis B, Herpes) syphilis and Other sexually transmitted infections including HIV, Leptospirosis.

Parents to child transmission of HIV infection. (PPTCT)

6. Evaluation of the fetal and maternal health in complicated pregnancy by making use of available diagnostic modalities and plan for safe delivery of the fetus while safeguarding the maternal health. Identification of fetus at risk and management.

High risk pregnancy - Post caesarean pregnancy, prolonged gestation, preterm labour, fetal growth restriction, premature rupture of membranes, blood group incompatibility, recurrent pregnancy wastages. Imaging techniques, CTG

7. Prenatal diagnosis of fetal abnormalities and appropriate care. Fetal therapy. PNDT Act and its implications.
8. Partographic monitoring of labour progress, early recognition of dysfunctional labour and appropriate interventions during labour including active management of labour.
9. Obstetrical analgesia and anesthesia.
10. Induction and augmentation of labour.
11. Management of abnormal labour : Abnormal pelvis, soft tissue abnormalities in birth passage, Malpresentation and malpositions of fetus, abnormal uterine action, obstructed labour and cervical dystocia. Third stage complications - PPH including surgical management, retained placenta, uterine inversion, post partum collapse, amniotic fluid embolism.
12. Abnormal puerperium, Puerperal sepsis
Thrombophlebitis, Mastitis, Puerperal venous sinus thrombosis,Psychosis.
13. National Health Programmes to improve the maternal and child health, social obstetrics and vital statistics. (Maternal and Perinatal mortality)
14. Drugs used in obstetric practice including prostaglandins.FDA Classification
15.Coagulation disorders in obstetrics, Blood and component therapy.

16.Operative obstetrics - decision making, technique, recognition and management of complications - C.S. instrumental delivery, obstetrics hysterectomy, role of destructive surgery.Manipulations-version,MRP etc.
Forceps,Vaccum, Internal iliac artery ligation

17. Intensive care in obstetrics for critically ill patient. Fluid and electrolyte balance, volume status maintenance, protecting vital organ function.
18. Provision of safe abortion services - selection of case, techniques, and management of complications. Septic abortion, Criminal abortion, MTP Act Adoption laws.

NEW BORN

1. Care of newborn
care of preterm, S.G.A.neonates, infants of diabetec mother
2.Asphyxia & Neonatal resuscitation (Respiratory distress syndrome and Meconium aspiration syndrome)
3. Neonatal sepsis - prevention, Early detection & management.
4. Neonatal hyperbilirubinemia, investigation and management.
5. Birth trauma - prevention, early detection & management.
6.Detection of congenital malformations in new born and make timely referrals for surgical corrections.
7. Management of the common problems in neonatal period.

GYNAECOLOGY :

Basic sciences

Development of genital tract and associated malformations. Basics of breast diseases related to ob/gy

Applied anatomy of female genital tract, abdominal wall and urinary tract.

Physiology of menstruation and ovulation

Physiology of spermatogenesis

Endocrinology - hypothalamus pituitary, thyroid and adrenal glands Neurotransmitters

Common menstrual disorders and their management

3. Diagnosis and surgical management of clinical conditions related to congenital malformations of genital tract. Reconstructive surgery in gynaecology

4. Chromosomal abnormalities and intersex. Ambiguous sex at birth

5. Reproductive Endocrinology : Evaluation of primary and secondary amenorrhoea, management of hyperprolactinemia, Hirsutism, chronic anovulation and PCOD,. Thyroid dysfunction.

6. Endometriosis and adenomyosis - medical and surgical management.

7. Infertility evaluation and management. Use of ovulation induction methods and Tubal microsurgery, Assisted reproduction techniques , management of immunological factors in infertility. Adoption law, medico-legal and ethical issues.

8. Reproductive Tract Infections, Sexually Transmitted Infections, HIV/AIDS : Prevention, Diagnosis and management.Genital Tuberculosis.

9 Screening for genital malignancies - cytology, colposcopy and biochemistry. Management of premalignant lesions

10. Benign and malignant tumors of genital tract - Early diagnosis and management.
11. Principles and practice of oncology in gynaecology - chemotherapy, radiotherapy, palliative treatment.
12. Supports of pelvic organs , genital prolapse,surgical management of genital prolapse.
13. Common urological problems in gynaecology - SUI, voiding difficulties, VVF, urodynamics, surgical repair of genital fistulae, ureteric and bladder injuries**.**
14. Management of menopouse, prevention of complications, HRT, cancer screening - genital, breast.
15. Recent advances.
16. Newer diagnostic aids - USG, interventional sonography, other imaging techniques, endoscopy.
17. Hysteroscopy, laporoscopy - diagnostic, simple surgical procedures, including laparoscopic tubal occlusion , endometrial ablative techniques, colposcopy**.**
18. Medicolegal aspects, ethics, communications and counselling.(SEXUAL / ASSAULTS)
19. Operative gynaecology - Selection of case, technique and management of complications of minor and major gynaecology procedures.

- Abdominal and vaginal hysterectomy
- Surgical procedures for genital prolapse
- Surgical management of benign and malignant genital neoplasms.
- Repair of genital fistulae, SUI
- Operative endoscopy – Laparosocpic, Hysteroscopic

20. Recent advances in gynaecology - diagnostic and therapeutic
21. Special groups - Pediatric and adolescent gynaecology, geriatric gynaecology
22. Evidence based management

FAMILY PLANNING :

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1. Demography and population Dynamics.
2. Contraception - Temporary methods. Permanent methods (vasectomy and female sterilization) Legal issues.
3. MTP Act and procedures of MTP in first & second trimester.(Recent Amendments, Legal/ethical issues)
4. Emergency contraception.
5. Recent advances, New development, Future research work in contraceptive technology.

OBSTETRICS AND GYNAECOLOGY - M.D. EXAMINATION

(As per Direction No. 01/2008 dtd. 26/05/2008)

Recommended Books

OBSTETRICS

SN	Must Read	Desirable to Read	Good to read
1	C.S.Dawn's Text book of Obstetrics and Neonatology	Medical Disorders in Pregnancy by DeSwiet	High Risk pregnancy by James
2	Ian Donald Practical Obstetrics problems	Obstetrics by Ian Donald	Williams Obstetrics
3		Arias, High Risk Pregnancy	
4	Munro-Kerr's Operative Obstetrics	Progress in OBGY, Studd	Operative Obstetrics by Douglas
5			Recent Advances in Obst/Gyn
6			All on net
7			FOGSI Books

GYNECOLOGY

SN	Must Read	Desirable to Read	Good to read
1	Novacs Gynecology	Reproductive Endocrinology by Speroff	Gynecology Devherst
2	TeLindes Operative Gynecology	Infertility by Insler	All on net
3	C.S.Down's Textbook of gynecology and contraception	Endocrinology by Rajan	FOGSI Books
4	Bereks gynecological Oncology	Gynacology by Gold	
5	Gynecology by P.K.Devi		Shaws textbook of gynecology
6	Jeffcoat's Principles of Gynaecolgy	Bonney's Operative Gynecology	
7	Standard Operating Procedures in Obstetrics and Gynecology by Dr. shrinivas Gadappa	---	---

FAMILY PLANNING

SN	Must Read	Desirable to Read	Good to read
1	Family Planning Practices by S.K .Chaudhary	Reproductive endocrinology by Speroff	Population reports
2	C.S.Dawn’s book on Contraception		

Journals/ Periodicals;

SN	Must Read	Desirable to Read	Good to read
1	Clinic in Obst. & gynecology	Year books	Am J Obst Gynec
2	North Americal clinic in ObGy	Annuals	Br. J Obst Gync.
3	J. Obst. Gyn India		Obstet Gynec Survey
			Fertility & Sterility

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

SYLLABUS FOR POST GRADUATE COURSES IN OPHTHALMOLOGY

1. Every candidate for the post graduate courses in ophthalmology must have obtained the Bachelor of Medicine and Bachelor of Surgery Degree of this University.
2. He or She should complete two years and three years academic terms for Post-graduate Diploma and Degree course in Ophthalmology as per MCI norms.
3. Every candidate presenting himself for these courses must send to the registrar with his application for admission of registration the following certificates –

1. Certificate of having MBBS degree.
2. Maharashtra Medical Council Certificate.
3. Eligibility Certificate.
4. Simultaneous registration for degree and diploma courses shall not be permitted.
5. Holder of diploma in any subject are not been give any concession of duration for completing post – graduate degree.
6. The subject for study shall be

A) Anatomy and Embryology of Eye including the contents of the orbital bones in relation thereof and the central nervous system as far as it refers to eye.(this includes anatomy of each structure of the eyeball for e.g. – Cornea, Iris, Choroid, Retina, Lens, Vitreous, Lids, etc)

B) Physiology of the Eye – Which includes physiology of vision, optics, binocular vision, Aqueous secretions, tear secretion, metabolism of various structures of the ye like cornea, lens, etc.

C) Various errors of refraction and their principles and optics.

D) Ophthalmic Medicine and Surgery (All Diseases related to various structures of the eye for eg – Lid, Adnexa, Conjunctiva, Cornea, Uvea, Lens, Vitreous, Retina,optic Nerve, Extraocular muscles, Tumors .)

E) Pathology and Bacteriology of the Eye.

F) Relation of ophthalmology to general medicine.

G) Eye Banking and its aspects.

H) National Program for Control of Blindness and its applications in Community Ophthalmology.

I) Various new innovations in Ophthalmology for example like Lasers in Ophthalmology, New Drugs in Ophthalmology, New techniques in operative skills, various transplant surgeries like – Keratoplasty, Stem cells transplant, amniotic membrane transplant.

J) Therapeutics in Ophthalmology

K) Radio therapy in Ophthalmology.

EXAMINATION PATTERN – For M.S. Ophthalmology –
(As per Direction No. 01/2008 dtd. 26/05/2008)

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

SYLLABUS OF M.S. ORTHOPAEDICS

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

NASHIK - 422 005.

Syllabus for M.S. (Orth.)

Syllabus :

1) Basic Sciences Related to Locomotor system.
   1) Development, histology of bone, cartilage, collagen, muscles and nerve.
   2) Physiology of bone, carliage, muscle & nerve.

2) Surgical pathology related to bones, cartilage, muscle, collagen & nerve in various congenital affections, infections, Tumours and timorous conditions and metabolic affections.

3) Orthopaedic diseases
   - Metabolic bone disease
   - Bone infections – Acute and Chronic
   - Congenital deformities and development conditions of upper extremity, lower extremity, spine general defects.
   - Diseases of joints
   - Tumours of Bones
   - Orthopaedic Neurology including spine bifida, Poliomyelitis and cerebral palsy.
   - Diseases of muscle, fibrous tissue and vessels
   - Regional orthopaedic conditions related to neck, shoulder, elbow, wrist, hand, hip, knee, ankle , foot, back and pelvis.
   - Special subject – Orthopaedic Radiology Amputation and disarticulation physiotherapy and rehabilitation

   Recent advances in orthopaedic diseases.

4) General principles of Surgery and Traumatology.
   - Wound healing
   - Fracture healing
   - Rehabilitation after bone and joint injuries
   - Systematic response to injury
   - Acute trauma care and early management of injured
   - Injury to head, face, chest, abdomen, vessels & nerves.
   - Polytrauma
   - Fracture & dislocations in all bones and joints including diagnosis, classifications, various modalities of investigation and operative non-operative treatment including complications.
   - Fractures in children
   - Pathological fractures
   - Recent Advance in various fractures and complications management.

5) Exposure to surgical techniques & surgical approaches to various regions to manage common infection, tumor, joint diseases, different type of trauma, congenital, neurological and miscellaneous conditions.

6) Principles of Arthroscopy microsurgery & Arthroplasty.

7) Orthotics & Prosthetics, disability calculation, Bio-mechanics of gait, splints.

8) Thesis – Aim is to train the PG student in research work. Topics should be in experimental, clinical, retrospective analysis or combination such that students is encouraged to do exhaustive reference work. Topics should be relevant to subject and region of work. Topics should allotted within first three months of training. The candidate should complete review of literature by end of the first year and submit his completed thesis six months before the final examination. Subject of thesis should be approved by University within first six months.

9) Under Graduate teaching in clinical methods.

10) Seminar presentation on common topics.

11) Journal reading and discussion.

12) Case presentation, ward record maintenance.

13) Adequate experience in closed reducation of various fractures, as isting major operation, independent operative management of common orthopaedic condition.

14) Preparation of paper for presentation in conference.

15) Preparation of article for publication.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

NASHIK - 422 005.

Scheme of Theory Exam. in Orthopaedics for M.S. (Ortho.) Exam.

(As per Direction No. 01/2008 dtd. 26/05/2008

Provisional Syllabus for Diploma in Orthopaedics

1) Basic Sciences related to Locornotor System
   i) Histology of bone, cartilage, muscles, collagen, Nerves
   ii) Physiology of bone, cartilage, muscles, collagen and Nerves
2) Surgical Pathology related to Bones, cartilage, Muscle, collagen and Nerves in various.
   Congenital affection, infections, Tuirnours and turnours conditions a metabolic affection.
3) General principles of surgery and Traurratology
   i) Wound healing
   ii) Fracture healing
   iii) Rehabilitation after bone and joint injury
   iv) Systemic response to injury
   v) Fracture and dislocation in all bones its management including complications.
   vi) Injury to chest, abdomen and head
   vii) Ploytrauma
   viii) Fractures in children
4) Orthopaedics diseases
   i) Metabolic Bone Disease
   ii) Bone infections – Acute and chronic
   iii) Congenital and development Deformities
      - upper extremity
      - Lower extremity
      - Spine
      - General defects
   iv) Disease of joints
   v) Tumours of Bones
   vi) Orthopaedics Neurology – Spina bifida, Polio, Cerebral Palsy
   vii) Disease of muscles, nerves , vessels and fibrous tissues
   viii) Regional Orthopaedics related to spine, shoulder
   ix) Elbow, wrist, hip, knee, ankle and foot.
   x) Special Subjects
      - Orthopaedics Radiology
      - Amputation
      - Physiotherapy
      - ALTS
      - First Aid

Examination Scheme for D. (Ortho)
(As per Direction No. 01/2008 dtd. 26/05/2008

Theory Exam. Total three papers, each of three hours duration and carrying 80 marks each. Total = 240 Marks.

Paper I	-	Anatomy, Physiology and Pathology as applicable to Orthopaedics.
Paper II	-	Traumatology and general Surgery,
Paper III	-	General Orthopaedics

Each paper will have four questions of 25 marks each.

Practical Exam.

Total Marks	=	300
Long Case 1	=	100
Short Case 2	50 X 2 =	100

Tables : 100

1) Instruments	=	20
2) X-rays	=	20
3) Specimen & Bones and splints	=	20
4) Ward round	=	20
5) Operation	=	20

Internal Exam.

Total Marks	=	100
Theory	=	50
Practical	=	50

For further examination the internal assessment marks should be calculated based on periodical tests in theory and practical at every term i.e. 4 tests for D. (Ortho)

Passing will be 50% of the marks in each head separately i.e. Theory, Practical and internal examination. Total marks should be 50% of the total marks for passing