



Dr. D. Y. PATIL VIDYAPEETH, PUNE
(Deemed to be University)

**Syllabus for
Post Graduate
(Para - Clinical Subjects)**

2014 - 15
(Amended / Revised upto July 2019)



Dr. D.Y. PATIL VIDYAPEETH, PUNE
(Deemed to be University)

(Re-accredited by NAAC with a CGPA of 3.62 on a four point scale at 'A' Grade)
(An ISO 9001 : 2015 Certified University)

Dr. A. N. Suryakar
Registrar

Ref. No. : DPU/875-vii/2019

Date : 11/09/2019

NOTIFICATION

Whereas in pursuance of the following decisions taken by the Board of Management, it is hereby notified to all concerned that the "Syllabus for Post Graduate (Para-Clinical Subjects) – 2014-15" is revised upto July 2019 and hereby published.

- Modifications in Question Paper format of MD Pathology University examination vide Resolution No. BM-16(ix)-18, dated 21st July, 2018.
- Change in duration of MD Microbiology practical examination vide Resolution No. BM-10(ii)-19 dated, 12th April, 2019.
- Graduate Attributes, Programme Outcomes (POs), Course Outcomes (Cos) and gap analysis for all courses of UG and PG Programmes for Para-Clinical and Surgical Subjects vide Resolution No. BM-10(vii)-19 dated, 12th April, 2019.
- Interdisciplinary subjects of M.B.B.S, M.D./M.S. and Super-specialty (D.M./M.Ch.) Programs under the Faculty of Medicine vide Resolution No. BM-10(viii) dated 12th April, 2019.

The Syllabus for Post Graduate (Para-Clinical Subjects) – 2014-15" is revised upto July 2019 will be useful to all the concerned. This will come into force with immediate effect.




(Dr. A. N. Suryakar)
Registrar

Copy to:

1. PS to Chancellor for kind information of Hon'ble Chancellor, Dr. D. Y. Patil Vidyapeeth, Pune.
2. PS to Vice Chancellor for kind information of Hon'ble Vice Chancellor, Dr. D. Y. Patil Vidyapeeth, Pune.
3. The Dean, Dr. D. Y. Patil Medical College Hospital & Research Centre, Pimpri, Pune
4. The Controller of Examinations, Dr. D. Y. Patil Vidyapeeth, Pune.
5. Director (IQAC), Dr. D. Y. Patil Vidyapeeth, Pune.
6. Web Master for uploading on Website.

**MAPPING OF PROGRAMME OUTCOMES [POs] AND COURSE
OUTCOMES [COs] OF PG PROGRAMMES**

No	
PO 1	Knowledge and Skills
PO 2	Planning and problem solving abilities
PO 3	Communication
PO 4	Research Aptitude
PO 5	Professionalism and Ethics
PO 6	Leadership
PO 7	Societal Responsibilities
PO 8	Environment and Sustainability
PO 9	Lifelong Learner

PATHOLOGY

Year

Course Code	Course Title
PC04	MD Pathology

PROGRAMME OUTCOMES

Course 1 (Subject Code)

CO No.	At the end of the course, the learner should be able to:	Mapped Programme Outcomes
PC04.1	Should have high standards of theoretical and practical knowledge in morbid anatomy, histopathology, should be able to perform and interpret routine and specialised work in histotechniques.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9
PC04.2	Should have adequate skills in cytology and clinical pathology	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9
PC04.3	Demonstrate sufficient skills in haematology, transfusion medicine and chemical pathology	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9
PC04.4	Should be able to maintain quality control in laboratory setup along with managing and operation of various laboratory instruments	PO1, PO2, PO3, PO4, PO5, PO6, PO9
PC04.5	Should be able to perform clinicopathological correlation in a case of medical autopsy.	PO1, PO2, PO3, PO5, PO6, PO7, PO9
PC04.6	Should be well versed and competent in performing and interpreting modern recent diagnostic techniques such as IHC, IF, flowcytometry and molecular biology.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9
PC04.7	Demonstrate empathy and humane approach towards patients and exhibit interpersonal behavior in accordance with the societal norms and expectations	PO1, PO2, PO3, PO5, PO6, PO7, PO8, PO9

CO No.	At the end of the course, the learner should be able to:	Mapped Programme Outcomes
PC04.8	Demonstrate competence in basic concepts of research methodology and be able to critically analyze relevant published research literature.	PO1,PO2,PO3,PO4,PO5 PO9
PC04.9	Practice pathology ethically and in step with the principles of primary health care.	PO1,PO2,PO3,PO5 PO6, PO7, PO9
PC04.10	Develop skills as a self – directed learner, recognizing continuing educational needs, select and use appropriate learning resources	PO1,PO2,PO3, PO6, PO7, PO9
PC04.11	Function as an effective leader to run pathological laboratory in accordance with the health care needs of the society.	PO9



PATHOLOGY

SYLLABUS FOR DOCTOR OF MEDICINE (MD) IN PATHOLOGY

GOAL :

The course aims at moulding a suitable medical graduate having correct aptitude and devotion into a highly competent and efficient specialist capable of providing optimal pathology services in any medical set up and enhancing knowledge and research in the subject , in a period of three years.

OBJECTIVES :

2.1 KNOWLEDGE :

- 2.1.1 At the end of the course the candidate should acquire a high standard of theoretical knowledge in morbid anatomy, histopathology, cytology and hematology.
- 2.1.2 The candidate should also gain adequate and up-to-date knowledge to deal with the diagnostic problems, investigations and their interpretation in the subject of chemical pathology, microbiology , clinical pathology and transfusion medicine .
- 2.1.3 The candidate should also be conversant with the recent developments in concepts and practice of above subject.
- 2.1.4 The candidate should become competent and proficient in imparting training and to various categories of medical professional including research at PG level in the subject. He should also be capable of inducing research aptitude in trainees.

2.2 SKILLS :

- 2.2.1 The specialist should be capable of performing most of the important investigative procedures pertaining to the speciality to aid diagnosis, management and prevention of diseases
- 2.2.2 Should have optimum skill and competency to contribute to the efforts of practitioners at various branches of medicine for providing optimum health needs of the society .
- 2.2.3 Should be equipped with good teaching skill and aptitude to induce , train guide and evaluate other trainees in theoretical and practical aspects of the subject.
- 2.2.4 Acquire skill to innovate and improve investigative techniques and research procedures.

- 2.2.5 Utilize skill and resourcefulness to choose , evaluate and incorporate suitable material and literature to improve own efficiency and that of others with him.
- 2.2.6 Should be capable of planning, organizing, establishing and supervising pathology services in all types of medical establishments.

2.3 SPECIFIC LEARNING OBJECTIVES :

2.3.1 COGNITIVE DOMAIN :

- 2.3.1.1 The student should be able to understand, interpret and diagnose histopathology, cytology slides, interpret and report on other patient samples which are received in the laboratory : as blood and bone marrow (haematology) clinical and chemical pathology, transfusion medicine related (blood bank). Should be able to advice the clinicians on problem cases.
- 2.3.1.2 Able to make and explain clinicopathological correlation in problem cases
- 2.3.1.3 The student should be able to understand and perform research and be familiar with recent advances.
- 2.3.1.4 Should be able to teach undergraduate, post graduates, nursing and paramedical staff on issues pertaining to laboratory medicine.
- 2.3.1.5 Should be able to write and present research papers.
- 2.3.1.6 Should be able to supervise work delivered by subordinates and maintain laboratory records.
- 2.3.1.7 Should be able to maintain quality control in the lab.
- 2.3.1.8 Should be able to maintain high level of biosafety in the lab to prevent accidental infections to staff.

2.3.2 PSYCHOMOTOR DOMAIN

- 2.3.2.1 The student should be familiar with the correct ways of collecting patient samples for conducting various laboratory tests.
- 2.3.2.2 Should be able to perform and interpret various lab test expected to be done in a tertiary level hospital.

- 2.3.2.3 Should be able to understand and perform operation of various laboratory instruments along with their routine care and maintenance.
- 2.3.2.4 Should be able to manage and perform a medical autopsy and interpret it, giving the findings and cause of death with a clinicopathologic correlation. Should be able to analyse surgical specimens received in the laboratory, interpret the finding and offer a tissue diagnosis.
- 2.3.2.5 Should be able to perform independently techniques like immuno- histochemistry, Immunohistochemistry, immunofluorescence.

2.3.3 AFFECTIVE DOMAIN

- 2.3.3.1 The student should respect the rights of a patient and maintain high levels of ethics and etiquette in interacting with patients, their relatives, the hospital staff, colleagues and peers.
- 2.3.3.2 Should have high level of communication skills in dealing with patients, their relatives and hospital personnel, and should cultivate good team work quality.
- 2.3.3.3 Should understand situations where consultations with other colleagues and second opinions are required.
- 2.3.3.4 Should be involved with teaching and research, in a manner to inspire others.

3. GENERAL FACILITATION AND INTEGRATION OF LEARNING OBJECTIVES :

Stress will be placed on the integration of theoretical aspects and newer developments being optimally integrated with practical laboratory methods and research. Students will be allowed free access to various avenues of the subject by making him actively involved in daily academic, diagnostic and research work. Special attention and efforts will be made to facilitate the trainee to acquire , refine and integrate his knowledge and skill by interacting and discussing with other branches of medicine and superspecialities to make a very competent and updated member of the profession. All facilities and encouragement will be provided for such interactions by attending conferences, seminars, workshops group discussions and other deliberations.

4. TRAINING AND WORK SCHEDULES :

- 4.1** The duration of the course of MD (Pathology) will be 3 years. Each PG student will be assigned a post graduate guide immediately on joining the course. The guide will facilitate the correct orientation of the candidate, the new curriculum, encourage revision of undergraduate subjects and other aspects so that the candidate is made fully aware of what is expected of him / her at each stage. The orientation will also include selection of a suitable topic for research and dissertation.
- 4.2** The PG trainee will work as full time resident like a resident in other specialities. 80% attendance will be ensured in each term. Individual and collective responsibilities will be assigned to the trainees in addition to participating in all routine activities in the department. Each trainee will be under the scrutiny and guidance of experienced teacher. General programme for the group will be carefully formulated on a weekly and monthly basis by a senior faculty member who will also co ordinate their training, postings and exposure to other specialities and institutions.
- 4.3** The PG student is required to maintain a record of work carried out in the various sections of the department, training activities attended, participation in seminars, CMEs, conferences, clinical meetings, autopsies conducted, participation in grossing, seminars and CPCs. This record made on a day to day basis will be scrutinized and evaluated by the senior faculty members regularly. This evaluation as well as other exercises carried out along with satisfactory attendance in each term will be the basis of assessing the performance and progress of the student and six monthly report on the performance will be submitted to the university / Dean signed by the post graduate guide assigned to the student.
- 4.4** In addition to thorough and detailed knowledge and skills in the chosen specialty, the candidate is made adequately equipped with awareness and familiarity with latest developments in basic medical sciences and allied subjects relevant to the discipline.
- 4.5** The PG student is expected to take an active role in imparting training to UG students, technicians and other faculties dependent on the department for such training. Participation in seminars, group discussions and interactions with other specialists and specialist trainees is facilitated to further refine and improve their competence.

- 4.6** Adequate exposure is given to enable the trainee to imbibe essential aspects of medical audit, planning and establishment of laboratory, quality control, basics of statistics, research procedures, research publications and presentations.

5. COURSE CONTENT

5.1 THEORITICAL KNOWLEDGE

5.1.1 BASIC SCIENCES

- Cell - structure, light and electron microscopic appearances, functional organizations at cellular level and functions of various organelles on morphological, biochemical and molecular basis.
- Anatomy and histology - structure of various cells, tissues and organs and organization of systems.
- Physiology – functions of various organs and systems, biochemical mechanisms, endocrine functions and immune mechanisms.
- Essentials of genetics with its functional and applied aspects.
- Essentials of bio statistics.
- Ethical issues related to medical practice and research.

5.1.2 GENERAL PATHOLOGY

- Historical milestones in the development of medical sciences with special emphasis on development of Pathology and its branches, definitions and causes of disease in general.
- Mechanism of cell injury, effects of sub lethal and lethal injury. Mechanism and relevance of apoptosis.
- Adaptations – in cells and tissues, intracellular accumulations, pigment accumulations, degenerations and aging.
- Recent advances in understanding of process of inflammation and repair.
- Basis of genetic diseases. Criteria and methods of their identification.

- Immune disorders– hypersensitivity and auto immune disorders.
- Effects of important infectious agents, environmental, nutritional and other factors and their identification.
- Hemodynamic disorders. Pathogenesis and effects.
- General neoplasia – etiological factors, latest developments in understanding the molecular basis of cancer development and behavior. General principles of nomenclature, classification, grading and staging.

5.1.3 SYSTEMIC PATHOLOGY

- Cardiovascular system. Important developmental disorders, disorders due to infection, inflammation, degeneration and neoplastic influences. Their morphology, effects and diagnosis.
- Respiratory tract – infections, inflammations, environmental, immunological and neoplastic disorders and their identification. Upper respiratory tract, lung and pleura.
- Gastrointestinal system. Disorders of mouth, salivary glands, esophagus, stomach, intestines, rectum and anal canal.
- Important disorders of ear and eye and their diagnosis.
- Hepatobiliary system. Disorders due to development, inflammation, immunity, metabolic, nutritional and neoplastic influences.
- Disorders of endocrine and exocrine pancreas.
- Kidney and urinary tract. Alterations in inflammations, metabolic and immune mediated disorders, important tumors and tumor like conditions.
- Male genital system. Congenital and inflammatory disorders, infertility, tumors – prostate , testis , penis and related structures.
- Female genital tract. Disorders of development, influence of hormones, infections, inflammations, pregnancy and neoplasia.
- Breast. Tumors and tumor like conditions. Pathogenesis pathology and diagnosis.

- Lymphoreticular system. Important inflammatory, immunologic and neoplastic disorders.
- Endocrine system. Disorders of thyroid, parathyroid, pituitary, adrenal and pineal gland.
- Skin Important lesions due to inflammation, immunological, metabolic disorders, tumors – benign and malignant.
- Bones and joints–metabolic and inflammatory disorders. Tumors and tumor like conditions.
- Soft tissues and skeletal muscles. Tumors and tumor like lesions. inflammatory, reactive and genetic alterations.
- Nervous system. Disorders due to inflammation, infection, degenerations, trauma, immunity and circulatory disturbances. Neoplasms. Clinicopathological correlations.

5.1.4 HAEMATOLOGY

- Development and morphology of blood cells, bone marrow, general alterations in diseases.
- Anemia – deficiency, hemolysis and other causes.
- Disorders of hemostasis and coagulation.
- Disorders of leucocytes and platelets – quantitative, qualitative and in neoplastic proliferations.
- Paraproteinemia and plasma cell disorders.
- Flow cytometry

5.1.5 TRANSFUSION MEDICINE

Essentials of blood bank serology and transfusion medicine.

5.1.6 CYTOLOGY

Exfoliative cytology and aspiration cytology.

5.1.7 CLINICAL PATHOLOGY

Alterations in urine, CSF, semen, body fluids and stool in important clinical conditions. Principles of examination, interpretation of results and clinical correlation.

- 5.1.8** Autopsy – Medico legal aspects, techniques, morphological alterations in various disorders in different systems and organs, clinico pathological correlation and identification of the cause of death and contributing factors in a systematic and rational order and importance.
- 5.1.9** Basic principles and methods employed in tissue processing, paraffin and frozen sections and staining procedures including tissue microarrays.
- 5.1.10** Essentials of electron microscopy, immunohistochemistry and immunofluorescence -indications and utility.
- 5.1.11 MICROBIOLOGY**
Essentials of disinfection and sterility. Classification, important characters, isolation and identification of microorganisms. Steps in the collection of specimen and microbiological investigations in common diseases due to microbial, parasitic and fungal infections to arrive at the correct diagnosis.
- 5.1.12 IMMUNOLOGY AND SEROLOGY**
Principles, methods, selection, utility and interpretation of common and current serological and immunological tests in the diagnosis of various diseases.
- 5.1.13 CHEMICAL PATHOLOGY**
Alterations of biochemical parameters, hormones and other constituents in serum and other body fluids in important diseases. Rationale of planning, collection of specimen, principles, utility and interpretation of such alterations to help diagnosis. Correlation of such biochemical parameters with clinical and morphological aspects of the diseases.
- 5.1.14** Planning and organization of laboratory. Choice of equipments, organization and legal requirements of blood bank and clinical laboratory. Quality control of the laboratory.
- 5.1.15** Essential principles, methods and utility of immunocytochemistry, molecular biology, flowcytometry and other newer methods, their utility and application in diagnostic pathology.
- 5.1.16** Medical audit, medicolegal aspects and liability of the practicing pathologist.

5.1.17 RECENT ADVANCES

The student should be acquainted with the recent advances in the subject as published from time to time.

5.2 PRACTICAL SKILLS

5.2.1 SURGICAL PATHOLOGY

- 5.2.1.1** The student should be able to give correct and clean instructions to the surgeon and other specialists for obtaining best specimen for histopathology and cytology, methods of preservation, use of correct fixatives, labeling, marking and provision of essential clinical history including other investigation findings with well thought out suspicions /provisional diagnoses.
- 5.2.1.2** Should be able to critically inspect the specimen received, correct dissection without distorting anatomical details, record the findings and select suitable and adequate areas for histopathology. He should be able to ensure optimum fixation and make preparation for cytology, frozen sections, electron microscopy, microbiology and other investigations possible with the available specimens to aid in the diagnosis immediately. on the receipt of specimen as indicated by the suspicions and clinical features.
- 5.2.1.3** Should be adept at tissue processing using correct methods for routine or urgent preparations as called for.
- 5.2.1.4** Cut good quality paraffin or frozen sections, Stain using H & E and other special stains as called for (eg. Reticulin, collagen,elastic fibres, iron, PAS, muci carmine etc) He should also be able to use selected immunocytochemical stains at least by one of the methods.
- 5.2.1.5** Using his theoretical acumen and other specific data as available, examine the microsections and be able give a reasonable and reliable interpretation and diagnosis in 85% of routine surgical specimens received. This should be at least 70% even in the absence of clinical data, when classical pathological lesions are encountered.

5.2.2 CYTOPATHOLOGY

- 5.2.2.1** Should be able to give correct and clear instructions for collection of material, preparation of slides and use of fixatives for slides and fluids. He should be able to prepare good quality cytological smears using appropriate procedures depending on the specimen and clinical requirement.
- 5.2.2.2** Should be able to stain the smears using Romanowsky stains, H & E, Pap, bacterial and fungal stains, as deemed necessary in the particular case.
- 5.2.2.3** Should be able to independently study the stained slides and be able to recognize malignant cytology correctly in at least 75% of the smears – if required using repetition of the procedures of collection by needle aspiration or other means.
- 5.2.2.4** He should be able to correctly categorize non neoplastic cytology into appropriate groups as reactive, inflammatory, inconclusive etc. and evaluate the hormonal status when required in 60% of the smears.
- 5.2.2.5** Should be able to correctly suggest the type of tumor in 70% of malignant tumors and 60% benign ones.
- 5.2.2.6** Should also be able to identify any parasite, fungi or bacteria present in the smears using appropriate technology and stain in 65% of cases.

5.2.3 AUTOPSY PATHOLOGY

- 5.2.3.1** With some physical assistance, should be able to perform a complete autopsy with proper planning as indicated in the case records. He should be able to identify and record all morbid anatomical features and conclude the cause of death with reasonable accuracy without the aid of histopathology in at least 80% of routine clinical autopsies.
- 5.2.3.2** With the aid of histopathology should be able to correctly identify the lesions in various organs in 90% of routine autopsies and give a fairly accurate and reasonable clinicopathological correlation to the clinical course as recorded during the illness and stay in the hospital

5.2.3.3 Should be able to make a comprehensive and easily understood autopsy record as per the autopsy protocol with logical conclusions leading to an unequivocal diagnosis as to the cause of death.

Note : When sufficient medical autopsies are not available in the institution, he should be able to use autopsy material (Reconstructed) available from other resources and demonstrate his ability to dissect, study and record the autopsy findings and conclusions in the rational and reasonably accurate way.

5.2.4 HEMATOLOGY

5.2.4.1 Should be able to correctly plan the sequence and line of investigation needed and collect appropriate samples for most hematological investigations in a large teaching hospital.

5.2.4.2 Independently perform tests for determining routine hematological parameters including reticulocyte and platelet counts. Should be competent in bone marrow staining, iron staining of bone marrow, special staining procedures like myeloperoxidase, LAP and PAS and interpret the results.

5.2.4.3 Should be able to perform sickling test, fetal haemoglobin estimation, osmotic fragility, bleeding and clotting time, prothrombin time, APTT, Hb electrophoresis, Coomb's test and clot solubility test.

5.2.4.4 Should be able to demonstrate convincingly familiarity and experience, with the principle, methods, instrumentation, utility and discretion in selection of following investigations in diagnosis of hematological disorders.

- Red cell indices
- Free haemoglobin in plasma and urine
- Tests for detection of antibodies in serum – complete and incomplete
- Acid lysis test (Hams)
- Serum electrophoresis
- Platelet function test
- Test for defective coagulation, DIC and coagulation inhibitors in blood.

- Serum ferritin , serum iron and iron binding capacity
- Cytogenetics and flow cytometry in hematology

5.2.4.5 Independently study blood and bone marrow smears and other parameters, make correct records and arrive at reasonable and logical conclusions as to the possible diagnosis / differential diagnosis in at least 85% of cases investigated in a large hospital with the help of other clinical and investigative data.

5.2.5 CLINICAL PATHOLOGY

5.2.5.1 Able to plan the laboratory investigations appropriate to the clinical condition of the patient with due consideration to priority, sequence relevance, speed and economy. Should be able to correctly interpret the investigation results and modify further investigations as indicated.

5.2.5.2 Should be able to perform with reasonable accuracy urine routine analysis including microscopy of urine sediments.

5.2.5.3 Independently perform complete physical, chemical and cytological examination of CSF, semen and other body fluids and interpret the results.

5.2.6 TRANSFUSION MEDICINE

5.2.6.1 Independently perform and interpret blood grouping, compatibility tests and antibody detection /titration for complete and incomplete antibodies.

5.2.6.2 Demonstrate the familiarity, experience and competence in selection of donors, providing foolproof instructions for collection, storage and issue of blood and blood components, precautions to be taken before and during transfusion and investigations in a case of suspected transfusion reaction.

5.2.6.3 Plan and perform essential investigations and interpret the results in suspected cases of hemolytic disease of newborn and during antenatal screening.

5.2.7 CHEMICAL PATHOLOGY

- 5.2.7.1** Able to plan biochemical investigations as indicated by the clinical condition with regard to speed, relevance, priority, sequence, economy and interpret the results.
- 5.2.7.2** Independently perform with reasonable accuracy and reproducibility estimations of blood sugar, blood urea, serum cholesterol, serum proteins, serum bilirubin and serum amylase by manual and / or automated techniques.
- 5.2.7.3** Demonstrate the familiarity, experience and competence with regard to estimation of uric acid, transaminases, alkaline phosphatase, creatinine, calcium, phosphates, electrolytes and blood gas analysis.
- 5.2.7.4** Be able to prepare and use standard solution and reagents for the above tests.
- 5.2.7.5** Be able to explain the instrumentation, working and principles of photoelectric colorimeter, spectrophotometer, pH meter, flame photometer blood gas analyzer and automated biochemistry analyzer, ELISA, CLIA.
- 5.2.7.6** Be able to analyze results , ensure reliability and accuracy by quality control procedures and standards used in auto analyzers.

5.2.8 MICROBIOLOGY

- 5.2.8.1** Be able to select, perform and interpret important microbiological investigations like wet preparations, gram stain, acid fast stain, stain for fungi, diphtheria and capsulated organisms.
- 5.2.8.2** Be able to plan the steps, collect appropriate specimens, culture media and other essentials and carry out necessary microbiological tests aimed at isolation and identification of common pathogens from specimens in microbiology like pus, stool, CSF, throat swabs and other routine specimens.

5.2.8.3 Perform important serological tests for the diagnosis of infections and immunological diseases like typhoid, syphilis, hepatitis rheumatoid/ rheumatic fever, screening tests for AIDS. Demonstrate the familiarity with these investigations with regard to their choice, utility, fallibility and improving their reliability.

5.2.9 GENERAL COMPETENCE

He should demonstrate satisfactory skill and capacity to innovate and improve all aspects of pathology services in large hospitals. At the end of the course the student should be able to interpret independently the recent investigation modalities like IHC, EM and flow cytometry reports.

6. RESEARCH, DISSERTATION

6.1 AIMS

To encourage the spirit of enquiry , initiative and aptitude for research.

6.2 OBJECTIVES

6.2.1 Explore, discern, identify and plan the most appropriate, feasible and useful areas of research considering the atmosphere and resources of the institution.

6.2.2 Acquire proficiency in obtaining, selecting and utilizing publications and literature most useful and relevant for the research subject selected.

6.2.3 Become capable of using correct discretion, deliberation and rationality in choice of methodology, critically analyze and evaluate the results, project useful conclusions and lessons learned from the research work.

6.3 GENERAL GUIDELINES

6.3.1 It is compulsory for the MD students to complete the research and prepare the research record (Dissertation) during the course. The work done independently by the student under the guidance of the PG teacher (Guide) should be the basis of the dissertation.

- 6.3.2** The research topic should be carefully chosen with regard to its value, utility and feasibility. It should not be repetition in part or whole of any other such research work submitted for the purpose in the past three years. A minor change in the topic is permissible by the university at any time during the work. However, major change in the topic will be permitted only if there is at least three clear terms between approval of such change and final university examination.
- 6.3.3** When the research work involves collaboration and co-operation with another faculty of institution, a suitable co guide may be designated from that discipline by the head of the institution.
- 6.3.4** In case when a guide becomes unavailable for any reason in the department in the last two terms of training, the student may still continue under the same guide who may sign for the authenticity of the work under him for the final certificate with the permission of the university. If the guide becomes unavailable for longer duration, earlier than the fifth term, a new guide has to be assigned to the student. The PG guide thus chosen cannot be assigned to another student till the current student completes the term. Age limit of the PG teacher /guide shall not exceed the limit as prescribed by the MCI from to time.
- 6.3.5** The dissertation completed in all respects need to be submitted to the university six months prior to the start of final examination. The same will be examined by three examiners (1 internal and 2 externals) appointed by the university. These examiners will be different from those appointed for practical or theory examination of the student. The dissertation should be to the satisfaction of at least two of the examiners to declare the student eligible to appear for the final examination.
- 6.3.6** In addition to specific research work for dissertation , the student will be constantly and repeatedly exposed and encouraged and trained in research methodology. This will be done by participation in conferences, seminars, symposia, group discussions and journal clubs organized at various levels. Special lectures and workshops on research methodology will also be organized with participation of experts.

7. EVALUATION

7.1 Title of theory papers with topics covered *

Paper I

General Pathology & Clinical Microbiology and Chemical Pathology

Paper II

Haematology, Transfusion Medicine, Clinical Pathology and Cytopathology

Paper III

Systemic Pathology I :- Gastrointestinal tract (including Salivary glands, Liver, Biliary tract and Pancreas), Cardiovascular system, Respiratory system, Urinary system, Reproductive system and Breast.

Paper IV

Systemic Pathology II :- Central Nervous system, Lymphoreticular system, Musculoskeletal system, Soft tissue, Endocrine organs, Skin, Eyes & Ear.

*** Notes :-**

- a) All questions are so designed as to test the candidates knowledge in basic sciences and recent advances related to the topics.
- b) Questions in Microbiology and Clinical / Chemical Pathology should be limited to 2 - 3 SAQ's.

7.2 PRACTICALS – 2 days

DETAILS OF EXERCISE

7.2.1 Slide reporting : histopathology, cytology and hematology	120
7.2.2 Reconstructed autopsy	20
7.2.3 Surgical pathology – grossing and Histotechniques (30+30)	60
7.2.4 Hematology HMG	15
Hematology- special hematology	15
7.2.5 Clinical pathology exercise	25
7.2.6 OSPE	25
7.2.7 Chemical Pathology exercise	20
7.2.8 Microbiology exercise	20

Total: 320

7.3 Viva: 80

Grand Total : 400

8. TEXTBOOKS AND JOURNALS RECOMMENDED

8.1 TEXTBOOKS :

- Robbins Pathological Basis of disease – 10th Edition
- General Pathology by J.R.Walter and Israel – 7th edition
- Andersons Pathology - LINDER – 10th Edition
- Surgical Pathology – Ackermans – Jaun Rosai – 10th Edition
- Diagnostic Surgical Pathology – S S Sternberg – 5th Edition
- Systemic Pathology . W St C Symmers
- Diagnostic Histopathology of tumors C D M Fletcher
- Soft Tissue Tumors - F M Enzinger , S W Weiss – 3rd edition
- Pathology of Pulmonary diseases – M J Saldhana
- Bone Tumors – A G Huvos
- GreenFied's Neuropathology – J H Adams -9th edition
- Russel's and Rubeinsteins Pathology of Tumors of Nervous system – D D Bignna
- Rosen's Breast Pathology – P P Rosen
- Pathology of the Gastrointestinal tract – S I Chun Ming
- Haines and Taylor – Obstetrical and Gynaecological Pathology – H Fox – 5th Edn
- Herpininstall's Pathology of the Kidney – J C Jenette – 7th Edition
- Lever's Histopathology of the Skin – D Elder – 12th edition
- Theory and Practices of Histopathological techniques – Bancroft J D – 7th Edn
- Manual and Atlas of Fine Needle Aspiration Cytology – S R Orell- 5th Edn
- Diagnostic Cytology and its Histopathologic basis – H G Koss-5th Edn
- Post Graduate Hematology – A V Hoffbrand-6th Edn
- Wintrobe's Clinical Hematology – Lee G R-10th Edn
- Practical Hematology – Dacie J V – 10th Edn
- Clinical Diagnosis and Management by Laboratory Methods – J B Henry-21st Ed
- Medical Microbiology – Cruick Shank

- Ananthnarayan & Paniker's Text book of Microbiology – 8th Edn
- Laboratory practice in tropical countries – Monica Cheesbrough (Part I , II)
- Parasitology by K.D.Chatterjee
- Medical Microbiology by Greenwood Slack Pentherer
- Short Text Book of Chemical Pathology – Baron
- Essentials Immunology – Roitt – 12th Edn
- Manual of Atlas of Autopsy Pathology – FINBEINER
- Transfusion Methods – Mollison
- Surgical Pathology & Cytopathology – Silverberg – 5th Edn
- Iochims – Lymph node Pathology
- Rubins – Clinicopathologic foundation of Medicine -6th Edn
- Color Atlas & Text of Pulmonary Pathology – Cagle-2nd Edn
- Orthopaedic Pathology – Peter Bullough- 5th Edn
- Comprehensive cytopathology – Bibbo – 4th Edn
- Atlas & text book of haematology – Dr.Tejinder Singh
- Biochemistry- Harper,s Biochemistry – Text book of Biochemistry

W.H.O.

- i)- Soft tissue & bone
- ii)- Lymphoid haemopoietic tissue
- iii)- Urinary system & GT
- iv)- Breast & FGT
- v)- Digestive system
- vi)- CNS

8.2 JOURNALS :

- The American Journal of Surgical Pathology
- The American Journal of Pathology
- Acta Cytologica
- Human Pathology
- Laboratory investigations
- Archives of Pathology and Laboratory Medicine
- The American Journal of Hematology

- The American Journal of Clinical Pathology
- British Journal of Hematology
- Blood
- Histopathology
- Diagnostic Cytopathology
- Indian Journal of Pathology and Microbiology
- Journal of Pathology
- Journal of Clinical Pathology
- Journal of cytology

8.3 PERIODIC PUBLICATIONS

- Recent advances in histopathology , Clinical Pathology
- Virchows Archives
- Year book series
- Pathology Annual
- Progress in Pathology series