UNMRP
UNIVERSITY NATIONAL MEDICAL RESIDENCY PROGRAM PAKISTAN

UNIFIED CURRICULA REGISTRY MEDICAL UNIVERSITIES OF PAKISTAN

CURRICULUM

GASTROENTEROLOGY
(MD GASTROENTEROLOGY)

5 YEARS,FULL TIME, RESIDENTIAL, STIPENED BASED, CLINICAL STRUCTUREDTRAINING

United Nations Academic Network (UNAN)
The UNESCO via the NEQMAP Bangkok

Note: All universities are included the international WHO directory discovered on the website of WHO and are duly recognized by the United Nations Academic Network (UNAN) and the UNESCO via the NEQMAP Bangkok

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Nomenclature Of The Proposed Course

The name of degree program shall be MD Gastroenterology. This name is wellrecognized and established for the last many decades worldwide.

Course Title

MD Gastroenterology

Duration of Course

The duration of MD Gastroenterology course shall be five (5) years with structured training in a recognized department under the guidance of an approved supervisor.

After admission in MD Gastroenterology Program the resident will spend first6 Months in the relevant Department of Gastroenterology as **Induction period** during which resident will get orientation in the chosen discipline and will also participate in the **mandatory workshops** (Appendix E)**.** The research project will be designed and the **synopsis** be prepared during this period.

On completion of Induction period the resident will start formal training in the Basic Principles of Internal Medicine for 18 Months, during this period the resident shall get the research synopsis approved by ASRB of the university. At the end of 2nd year, the candidate will take up Intermediate Examination.

During 3rd, 4th & 5th years, of the Program, there will be two components of the training.

- Clinical Training in Gastroenterology.
- Research and Thesis writing.

The candidate shall undergo clinical training to achieve educational objectives of MD Gastroenterology (knowledge & Skills) along with rotation in the relevant fields, which

will be carried out during the 4th and 5th year of the program. The clinical training shall be competency based. There shall be generic and specialty specific competencies and shall be assessed by continuous Internal Assessment. (Appendix F&G).

The Research Component and thesis writing shall be completed over the five years duration of the course. The Candidate will be spend total time equivalent to one calendar year for research during the training. Research can be done as one block or it can be done in the form of regular periodic rotation over five years as long as total research time is equivalent to one calendar year.

Admission Criteria

Applications for admission to MD Training Programs will be invited at the through advertisement in print and electronic media mentioning closing date of applications and date of Entry Examination.

- **Eligibility:**

The applicant on the last date of submission of applications foradmission must possess the:

- Basic Medical Qualification of MBBS or equivalent medical qualification recognized by Pakistan Medical & Dental Council.
- Certificate of one year's House Job experience in institutions recognized by Pakistan Medical & Dental Council Is essential at the time of interview. The applicant is required to submit Hope Certificate from the concerned Medical Superintendent that the House Job shall be completed before the Interview.
- Valid certificate of permanent or provisional registration with PakistanMedical & Dental Council.

Registration and Enrollment

- As per policy of Pakistan Medical & Dental Council the number of PG Trainees/ Students per supervisor shall be maximum 05 per annum for all PG programs including minor programs (if any).
- Beds to trainee ratio at the approved teaching site shall be at least 5 beds per trainee.

- The University will approve supervisors for MD courses.
- Candidates selected for the courses after their enrollment at the relevant institutions shall be registered with University as per prescribed Registration Regulations.

Accreditation Related Issues Of The Institution

Faculty

Properly qualified teaching staff in accordance with the requirements ofPakistan Medical and Dental Council (PMDC)

Adequate Space

Including class-rooms (with audiovisual aids), demonstration rooms, computer laband clinical pathology lab etc.

Library

Departmental library should have latest editions of recommended books, referencebooks and latest journals (National and International).

Accreditation of Gastroenterology training program can be suspended on temporary or permanent basis by the University, if the program does not comply with requirements for residents training as laid out in this curriculum. Program should be presented to the University along with a plan for implementation of curriculum for training of residents. Programs should have documentation of residents training activities and evaluation on monthly basis. To ensure a uniform and standardized quality of training and availability of the training facilities, the University reserves the right to make surprise visits of the training program for monitoring purposes and may take appropriate action if deemed necessary.

AIMS AND OBJECTIVES OF THE COURSE

➢ AIM

The aim of five years MD program in Gastroenterology is to train residents to acquire the competency of a specialist in the field of Gastroenterology so that they can become good teachers, researchers and clinicians in their specialty after completion of their training.

➢ GENERAL OBJECTIVES

MD Gastroenterology training should enable a student to:

- Access and apply relevant knowledge to clinical practice:
- Maintain currency of knowledge
- Apply scientific knowledge in practice
- Appropriate to patient need and context
- Critically evaluate new technology
- Safely and effectively performs appropriate clinical skills & procedures:
- Consistently demonstrate sound clinical skills
- Demonstrate procedural knowledge and technical skill at a levelappropriate to the level of training
- Demonstrate manual dexterity required to carry out procedures
- Adapt their skills in the context of each patient and procedure
- Maintain and acquire new skills
- Approach and carries out procedures with due attention to safety ofpatient, self and others
- Critically analyze their own clinical performance for continuous improvement
- Design and implement effective management plans:

- Recognize the clinical features, accurately diagnose and manage gastroenteric problems
- Formulate a well-reasoned provisional diagnosis and management planbased on a thorough history and examination
- Formulate a differential diagnosis based on investigative findings
- Manage patients in ways that demonstrate sensitivity to their physical,social, cultural and psychological needs
- Recognize disorders of the Gastroenterological system anddifferentiate those amenable to medical treatment
- Effectively recognize and manage complications
- Accurately identify the benefits, risks and mechanisms of action ofcurrent and evolving treatment modalities
- Indicate alternatives in the process of interpreting investigations andin decision-making
- Manage complexity and uncertainty
- Consider all issues relevant to the patient
- Identify risk
- Assess and implement a risk management plan
- Critically evaluate and integrate new technologies and techniques.

➢ Organize diagnostic testing, imaging and consultation as needed:

- Select medically appropriate investigative tools and monitoringtechniques in a cost-effective and useful manner
- Appraise andinterpret appropriate diagnostic imaging and investigations according to patients' needs
- Critically evaluates the advantages and disadvantages of differentinvestigative modalities

➢ Communicate effectively:

- Communicate appropriate information to patients (and their family) about procedures, potentialities and risks associated, in ways that encourage their participation in informed decision making
- Communicate with the patient (and their family) the treatmentoptions including benefits and risks of each
- Communicate with and co-ordinate health management teams to achieve an optimal patient management
- Initiate the resolution of misunderstandings or disputes

- Modify communication to accommodate cultural and linguistic sensitivities of the patient

- **Recognize the value of knowledge and research and its application to clinical practice:**
  - Assume responsibility for self-directed learning
  - Critically appraise new trends in Gastroenterology
  - Facilitate the learning of others
- **Appreciate ethical issues associated with Gastroenterology:**
  - Consistently apply ethical principles
  - Identify ethical expectations that impact on medico-legal issues
  - Recognize the current legal aspects of informed consent and confidentiality
  - Be accountable for the management of their patients.
- **Professionalism by:**
  - Employing a critically reflective approach to Gastroenterology
  - Adhering with current regulations concerning workplace harassment
  - Regularly carrying out self and peer reviewed audit
  - Acknowledging and have insight into their own limitations
  - Acknowledging and learning from mistakes
- **Work in collaboration with members of an interdisciplinary team where appropriate:**
  - Collaborate with other professionals in the selection and use of various types of treatments assessing and weighing the indications and contraindications associated with each type
  - Develop a care plan for a patient in collaboration with members of an interdisciplinary team
  - Employ a consultative approach with colleagues and other professionals
  - Recognize the need to refer patients to other professionals.

➢ Management and Leadership

- Effective use of resources to balance patient care and system resources
- Identify and differentiate between system resources and patient needs
- Prioritize needs and demands dealing with limited system resources.
- Manage and lead clinical teams
- Recognize the importance of different types of expertise which contribute to the effective functioning of clinical team
- Maintain clinically relevant and accurate contemporaneous records

➢ Health advocacy:

- Promote health maintenance of patients
- Advocate for appropriate health resource allocation

SPECIFIC LEARNING OUTCOMES

Residents completing MD Gastroenterology training will have formal instruction, clinical experience, and will be able to demonstrate competence in the evaluation and management of adult and pediatric patients and applying scientific principles for the identification, prevention, treatment and rehabilitation of following acute and chronic disorders in Gastroenterology.

- **Esophagus**
  - Reflux Disorders
  - Medical and Surgical Management of Reflux
  - Barrett's Esophagus
  - Dysplasia and endoscopic management
  - Rumination syndrome, belching, aerophobia, Hiccoughs evaluation Acid
- **peptic disorders of the gastrointestinal tract**
  - Peptic ulcer disease and H. Pylori
  - Non-ulcer dyspepsia
  - NSAID in the pathogenesis of gastroduodenal ulcers and their complications
  - Gastroparesis and post- surgical gastric issues
- **Motor disorders of the gastrointestinal tract**
  - Achalasia, diffuse esophageal spasm and other spastic disorders, non-cardiac chest pain, intestinal pseudo-obstruction and scleroderma
  -
- **Other Stomach Conditions**
  - Gastric Polyps
  - Gastric Carcinoids
  -
- **Irritable bowel syndrome and Functional GI disorders**
  - Disorders of nutrient assimilation/malnutrition
- **Inflammatory bowel diseases (IBD)**
  - Diagnosis and management
  - Immunomodulatory and biologic therapy for IBD, advancements
  - Post-surgical management of IBD

- Complications of IBD / surgical complications and management
- Serologic markers and drug metabolite in IBD issues in surveillance and management of dysplasia in IBD

➢ Colonic Disease

- Colon cancer and screening
- Polyp surveillance, malignant polyps/serrated adenomas
- Constipation, pelvic floor dysfunction, evaluation and management
- Diverticular disease and complications/diverticulitis
- Endoscopic resection of colorectal polyps, guidelines and management
- Familial colorectal cancer
- Evidence based guidelines for cancer management and guidelines

➢ Other small bowel and colonic diseases

- Short gut syndrome
- Small bowel bacterial overgrowth syndrome
- Nonspecific colitis
- Radiation colitis and enteritis
- Solitary rectal ulcer syndrome
- Diversion colitis
- Graft vs host disease

➢ Vascular disorders of the gastrointestinal tract

- Mesenteric ischemia
- Acute ischemic colitis/chronic mesenteric ischemia
- Portal venous thrombosis

➢ Gastrointestinal infections

- Retroviral, mycotic, and parasitic diseases
- Clostridium difficile infection and management of recurrent disease

➢ Gastrointestinal diseases with an immune basis

- Celiac sprue
- Eosinophilic GI disorder/allergic GI disorder
- GI involvement in autoimmune disorders

Gastrointestinal neoplastic disease

- Tumor biology
- Neuroendocrine tumors
- Gastrointestinal lymphoma
- Anal canal cancer
- Chemotherapy and radiation treatment for GI malignancies
- Familial risk of gastric/esophageal cancer
- GI stromal tumors
- HIV related malignancy

Hepatology

- Acute viral hepatitis
- Alcoholic liver disease
- Non-alcoholic fatty liver disease
- Fulminant hepatic failure
- Chronic viral hepatitis
- HBV resistance
- Treatment of viral hepatitis (B and C)
- Spontaneous bacterial peritonitis and epatorenal syndrome in liver failure
- Management of complications of liver disease
- Drug and toxin induced liver disease
- Pregnancy related hepatobiliary disease
- Cholestatic syndromes (Primary sclerosing cholangitis/primary biliarycirrhosis etc)
- Genetic liver diseases (hemochromatosis, alpha-1 antitrypsin deficiency,
- Wilson's disease)
- Complication of chronic liver disease
- Autoimmune liver diseases
- Vascular disorders of liver (Budd-Chiari and ischemic/hypoxic hepatitis)
- Perioperative evaluation and management of liver disease patient
- Pre-transplant evaluation
- Management and evaluation of post-transplant patients
- Hepatocellular carcinoma/other hepatic malignancy
- Liver imaging modalities

- **Pancreatic Diseases;**
  - Acute pancreatitis
  - Chronic pancreatitis
  - Pancreatic function studies
  - Idiopathic pancreatitis
  - Nutritional support in acute and chronic pancreatitis
  - Radiologic evaluation of pancreas and biliary tract
  - Biliary dyskinesia/sphincter of Oddi dysfunction
  - Pancreatic divisum
  - Molecular genetic of hereditary pancreatic disorders
  - Pancreatic cancer

- **Biliary Diseases**
  - Abdominal pain and evaluation
  - Gall stone disease and acute cholecystitis (calculous and acalculous)
  - Neoplastic diseases of the gallbladder and bile ducts

- **Pediatric Gastroenterology**
  - IBD issues in pediatric population
  - Neonatal jaundice, and cholestasis
  - Common pediatric gastrointestinal problems:
  - Abdominal pain, constipation, diarrhea, cystic fibrosis necrotizing enterocolitis, Meckel's diverticulum, intestinal intussusception, and mid- gut volvulus
  - GI complications of malignancy and treatment
  - Rickets and other systemic disorders in GI and liver diseases
  - Geriatric gastroenterology
  - Endoscopic gastrostomy tube risks and complications
  - Evaluation and risks of endoscopic procedures among elderly
  - Effect of aging on gastrointestinal tract and common GI illness among elderly population

➢ Gastrointestinal bleeding

- Upper GI bleeding
- Non variceal GI bleeding and management
- Variceal bleeding and management
- Lower GI bleeding and management
- GI bleeding of obscure origin, evaluation and management (including arteriovenous malformations)

➢ Genetic/inherited disorders

- Genetic marker in Crohn's disease

➢ Advance Endoscopic Technique

- Capsule endoscopy
- Double balloon enteroscopy, single fiber endoscopy, narrow band imaging and confocal (high magnification endoscopy)
- Anticoagulants and antiplatelet agents and GI endoscopy
- Complications of endoscopic proceduresAnal canal

➢ Diseases/disorder

- Hemorrhoids and anal fissure
- Anal canal benign and malignant diseases
- Fecal incontinence and evaluation, fecal impaction

FOREIGN BODY MANAGEMENT

Other Topics

- Gastrointestinal and biliary manifestations of HIV infections
- Systemic Diseases affecting GI and liver, including para-neoplasticdisorders

Management of GI emergencies in the acutely ill patient including ileusAdvance Imaging Techniques in GI/Liver

- CT Colonography
- CT enterography
- PET Scan

Nutrition

- Nutritional issues in patients with IBD

Techniques used in the basic investigation of gastrointestinal cancer

- Flow cytometry
- Polymerase chain reaction assays
- Mutation analysis
- Methylation assays
- DNA sequencing and linkage analysis

Professional Skills

Residents shall learn professional skills in:

- Patient Management including eliciting pertinent history, performing physical examination, ordering and interpreting the result of appropriate investigations and thereby deciding and implementing appropriate treatment plan by maintaining follow up
- Psychosocial and emotional effects of acute and chronic illness on patients and their families
- Management of end of life issues and palliative care
- Quality improvement and patient safety activities

Procedural and Technical Skills

Residents shall learn technical and procedural skills in:

- Blood sample collection - venepuncture and finger prick methods of sample collection, use of different types of anticoagulants, containers and the effects ofdelay in processing and storage.

- Trainees should have knowledge of the indications, results and methods for:
- Breath testing for H pylori, bacterial overgrowth
- Oesophageal and rectal manometry and pH testing
- Gastric secretory tests
- Tests for gut absorption and inflammation
- Radiological evaluation of the GI tract
- Liver function tests
- Intestinal biopsy
- Liver biopsy
- Paracentesis
- Endoscopic procedures: Upper GI endoscopy including esophagogastro-duodenoscopy
- Endoscopic therapy of benign and malignant oesophageal strictures
- Thermal therapy of gastro-oesophageal tumours, ulcers and vascularmalformations
- Direct injection/banding techniques for bleeding lesions and tumour
- Enteroscopy
- Flexible sigmoidoscopy
- ERCP ; Therapeutic
- Diagnostic total colonoscopy
- Colonoscopic therapy of benign and malignant tumours and strictures
- Review of normal and abnormal blood films with emphasis on morphology of redcells, white cells and platelets.
- Familiarization with cytogenetics, understanding the principles of cytogenetics and appreciating the relevance and significance of chromosomes in diagnostichematology and Gastroenterology
- Understanding the principals involved in the molecular diagnosis of Gastroenteric disorders by
- Flow cytometry
- PCR
- FISH
- Western and Southern Blotting.
- Microarray technology
- Interpretation of imaging techniques commonly employed in the evaluation ofpatients with critical illness
- Practice infection control procedures and perform continuous quality Improvement.

REGULATIONS

Scheme of the Course

Course Structure	Components	Examination
At the End of 2nd Year MD Gastroenterology Program	• Principles of Internal Medicine • Relevant Basic Science (Physiology, Pharmacology, Pathology)	**Intermediate Examination** at the end of 2nd Year of M.D. Gastroenterology Program. Written= 300 Marks Clinical, TOACS/OSCE & ORAL = 200 Marks Total = 500 Marks
At the end of5th year MD Gastroenterology Program	**Clinical component** Professional Education in M.D. Gastroenterology Training in Gastroenterology with compulsory/optional rotations in the relevant fields. **Research component** Research work/Thesis writing must be completed and thesis be submitted at least 6 months before the end of final year of the program.	**Final Examination** at the end of 5th year of M.D. Gastroenterology Program. Written = 500 Marks Clinical, TOACS/OSCE & ORAL= 500 Marks Contribution of CIS = 100 Marks Thesis Evaluation = 400 Marks **Total = 1500 Marks** These is evaluation and defense at the endof 5th year of the program.

A summary of five years course in MD Gastroenterology is presented as under:

Intermediate Examination

The Intermediate Examination of M.D. Internal Medicine will held at the end of 2nd year of the program

Eligibility Criteria:

The candidates appearing in Intermediate Examination of the M.D.Gastroenterology Program are required:

- To have submitted certificate of completion of mandatory workshops.
- To have submitted certificate / certificates of completion of first two years of training from the supervisor / supervisors of rotations.
- To have submitted CIS assessment proforma from his/her own supervisor on 03 monthly basis and also from his/her supervisors during rotation, achieving a cumulative score of **75%**.
- To have submitted certificate of approval of synopsis or undertaking / affidavit that if synopsis not approved with 30 days of submission of application for the Intermediate Examination, the candidate will not be allowed to take the examinations and shall be removed from the training programme.
- To have submitted evidence of payment of examination fee.

Intermediate Examination Schedule and Fee

- Intermediate Examination at completion of two years training, will be held twice a year.
- There will be a minimum period of 30 days between submission of application for the examination and the conduction of examination.
- Examination fee will be determined periodically by the University.
- The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.
- The Controller of Examinations will issue Roll Number Slips on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee.

At the end of 2nd Year of MD Gastroenterology Programme.

Written Examination = 300 Marks

Clinical, TOACS/OSCE & ORAL = 200 Marks

Written:

MCQs = 100 (2 marks each MCQ)

SEQs = 10 (10 Marks each SEQ)

Total Principles of Internal Medicine	**300 Marks** 70 MCQs	7 SEQs
Specialty specific	10 MCQs	1 SEQs
Basic Sciences	20 MCQs	2 SEQs
Physiology	8 MCQs	1 SEQ
Pharmacology	4 MCQs	-------
Pathology	8 MCQs	1 SEQ

Clinical, TOACS/OSCE & ORAL

Four Short Cases =100 Marks

One Long Case = 50 Marks

TOACS/OSCE & ORAL =50 Mark

Total Marks= 200 Marks

Declaration of Results

The Candidate will have to score 60% marks in written and oral, practical/ clinical component and a cumulative score of 60 % to be declared successful in the Intermediate Examination.

A maximum total of four consecutive attempts (availed or unavailed) will be allowed in the Intermediate Examination during which the candidate will be allowed to continue his training program. If the candidate fails to pass his Intermediate Examination within the above mentioned limit of four attempts,the candidate shall be removed from the training program, and the seat would fall vacant, stipend/ scholarship if any would be stopped.

Final Examination

M.D. Gastroenterology

- **At the end of 5th Calendar year of the Program Eligibility Criteria:**

To appear in the Final Examination the candidate shall be required:

- To have submitted the result of passing Intermediate Examination.
- To have submitted the certificate of completion of training, issued
- by the Supervisor which will be mandatory.
- To have achieved a cumulative score of 75% in Continuous Internal assessments of all training years.
- To have got the thesis accepted and will then be eligible to appear inFinal Examination.
- To have submitted no dues certificate from all relevant departmentsincluding library, hostel, cashier etc.
- To have submitted evidence of submission of examination fee.

➢ Final Examination Schedule and Fee

- Final examination will be held twice a year.
- The candidates have to satisfy eligibility criteria before permission isgranted to take the examination.
- Examination fee will be determined and varied at periodic intervals bythe University.
- The examination fee once deposited cannot be refunded / carried overto the next examination under any circumstances.
- The Controller of Examinations will issue an Admittance Card with a photograph of the candidate on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee. This card will also show the Roll Number, date / timeand venue of examination.

Written Part	= 500 Marks
Clinical, TOACS/OSCE & ORAL	= 500 Marks
Contribution to Internal Assessment	= 100 MarksThesis
Examination	= 400 Marks
Total	**= 1500 Marks**

➢ Written Papers:

Paper 1	= 100 MCQs	5 SEQs
Paper 2	= 100 MCQs	5 SEQs
Total	**= 500 Marks**	

- **Clinical, TOACS/OSCE & ORAL**

Short Cases	= 200 Marks
Long Case	= 100 Marks
TOACS/OSCE & ORAL	= 200 Marks
Total	**= 500 Marks**

Declaration of Result

- **For the declaration of result**
  - The candidate must get his/her Thesis accepted.
  - The candidate must have passed the final written examination with 75
  - % marks and the clinical & oral examination securing 75 % marks. The cumulative passing score from the written and clinical/ oral
  - Examination shall be 70 %. Cumulative score of 70 % marks to be calculated by adding up secured marks of each component of the examination i.e written and clinical/ oral and then calculating its percentage.
  - The MD degree shall be awarded after acceptance of thesis and success in the final examination.
  - On completion of stipulated training period, irrespective of the result (pass or fail) the training slot of the candidate shall be declared vacant.

Submission / Evaluation of Synopsis

- The candidates shall prepare their synopsis as per guidelines provided by the Advanced Studies & Research Board, available on university website.
- The research topic in clinical subject should have 30% component related to basic sciences and 70% component related to applied clinical sciences. The research topic must consist of a reasonable sample size and sufficient numbers of variables to give training to the candidate to conduct research, to collect & analyze the data.
- Synopsis of research project shall be submitted by the end of the 2nd year of MD program. The synopsis after review by an Institutional Review Committee, shall be submitted to the University for Consideration by the Advanced Studies & Research Board, through the Principal / Dean /Head of the institution.

Submission of Thesis

- Thesis shall be submitted by the candidate duly recommended by the Supervisor.
- The minimum duration between approval of synopsis and submission of thesis shall be one year.
- The research thesis must be compiled and bound in accordance with the Thesis Format Guidelines approved by the University and available on website.
- The research thesis will be submitted along with the fee prescribed by the University.

Thesis Examination

- The candidate will submit his/her thesis at least 06 months prior to completion of training.
- The Thesis along with a certificate of approval from the supervisory will be submitted to the Registrar's office, who would record the date / time etc. and get received from the Controller of Examinations within 05 working days of receiving.
- The Controller of Examinations will submit a panel of eight examiners within 07 days for selection of four examiners by the Vice Chancellor. The Vice Chancellor shall return the final panel within 05 working days to the Controller of Examinations for processing and assessment. In case of any delay the Controller of Examinations would bring the case personally to the Vice Chancellor.
- The Supervisor shall not act as an examiner of the candidate and will not take part in evaluation of thesis.
- The Controller of Examinations will make sure that the Thesis is submitted to examiners in appropriate fashion and a reminder is sent after every ten days.
- The thesis will be evaluated by the examiners within a period of 06 weeks.
- In case the examiners fail to complete the task within 06 weeks with 02 fortnightly reminders by the Controller of Examinations, the Controller of Examinations will bring it to the notice of Vice Chancellor in person.
- In case of difficulty in find an internal examiner for thesis evaluation, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person as examiner in supersession of the relevant Clause of the University Regulations.
- There will be two internal and two external examiners. In case of difficulty in finding examiners, the Vice Chancellor would, in onsultation with the concerned Deans, appoint minimum of three, one internal and two externalexaminers.
- The total marks of thesis evaluation will be 400 and 60% marks will be required to pass the evaluation.
- The thesis will be considered accepted, if the cumulative score of all the examiners is 60%.
- The clinical training will end at completion of stipulated training period but the candidate will become eligible to appear in the Final Examination at completion of clinical training and after acceptance of thesis. In case clinical training ends earlier, the slot will fall vacant after stipulated training period.

Award of MD Gastroenterology Degree

After successful completion of the structured courses of MD Gastroenterology and qualifying Intermediate & Final examinations, (Written Clinical, TOACS/OSCE & ORAL and Thesis) the degree with title MD Gastroenterology shall be awarded.

CONTENT OUTLINE

MD Gastroenterology

- **Basic Sciences:**
  - Student is expected to acquire comprehensive knowledge of Physiology, Pathology and Pharmacology relevant to the clinical practice appropriate for Gastroenterology

- **Physiology**

  - Cellular organization, structure function correlations and physiologicalalterations in the endocrine organ systems of body

- **Structural and Functional Organization of the Cells of the Body**
  - Concept of cells as the structural, functional and genetic units of thebody.
  - Composition of protoplasm, division into cytoplasm and nucleus.
  - Role of macromolecules in the structural organization of the cell.
  - Cell components with their role in cell function.
  - Diversity of cell morphology as related to the varied functional demands. Physical activities of the living cells, intracellular movements, cellular locomotion, endocytosis and exocytosis.
  - Basic concepts of the principles of transport through cell membrane, membrane potential and action potential.
  - The cell cycle and cell division.
  - Energy balance, metabolism & nutrition
  - Uses of cell and tissue cultures.
  - DNA and RNA structure and protein synthesis.

➢ Gastrointestinal function:

- General functions of the gastrointestinal system
- Motor functions
- Reservoir function
- Digestion and absorption
- Emptying function
- Regulation of gastrointestinal function
- Motility: mastication, swallowing, gastric motility, intestinal motility and gall bladder motility.
- Secretory activity: formation, composition, function and control of Salvia, gastric, pancreatic, bile and intestinal secretions.
- Control of secretions
- Cephalic phase
- Gastric phase
- Intestinal phase
- Interdigestive phase
- GIT hormones controlling activities: Functions of the stomach, pancreas, gall bladder, liver and large intestine.
- Formation and composition of faeces, haustral churning, slow Peristalsis, mass peristalsis, mechanism of defecation.
- Circulation of bile. Principles and assessment of liver function tests. Interpretation of data, diagnostic tests.
- Hyperbilirubinaemia and congenital hyperbilirubinaemias.
- Hunger and thirst centers of the brain
- Control of hunger, appetite and its disorders.
- Membrane biochemistry and signal transduction
- Gene expression and the synthesis of proteins
- Bioenergetics; fuel oxidation and the generation of ATP
- Enzymes and biologic catalysis
- Tissue metabolism

➢ VITAMINS

- Classification, components, sources, absorption and functions (physiological and biochemical role).
- Daily requirements, effects of deficiency and hypervitaminosis.
- Salient morphologic features of diseases related to deficiency orexcess

of vitamins.

- **MINERALS**
  - Sources of calcium, phosphorous, iron, iodine, fluorine, magnesiumand manganese.
  - Trace elements and their clinical importance.
  - Absorption and factors required for it.
  - Functions and fate.

- **METABOLISM**
  - Metabolic rate and basal metabolic rate
  - Factors influencing metabolic rate, principles of measurement.

- **Carbohydrates**
  - Classification and dietary sources.
  - Digestion, absorption and utilization of dietary carbohydrates. Glucose tolerance test.
  - Glycogenesis, glycolysis, gluconeogenesis, glycogenolysis, processeswith the steps involved and effects of hormones.
  - Citric acid cycle, steps involved, its significance and the common final metabolic pathway.
  - Hexose monophosphate shunt: mechanism and significance.

- **Lipids**
  - Classification of simple, derived and compound lipids.
  - Dietary sources.
  - Digestion, absorption, utilization and control.
  - Fatty acid oxidation with steps involved.
  - Ketogenesis and its significance.
  - Lipotropic factors and their actions. Lipoproteins, types and importance.

➢ Proteins and Amino Acids

- Classification and dietary sources of proteins.
- Digestion, absorption, utilization and control.
- Fate of amino acids.
- Urea formation with steps involved.
- Functions and effects of deficiency.
- Nucleoproteins:
- Structure and metabolism.
- Pigment Metabolism
- Basic concept of endogenous and exogenous pigments.
- Causes of pigmentation and depigmentation.
- Disorders of pigment metabolism, inherited disorders, acquired disorders from deficiency or excess of vitamins, minerals, fats, carbohydrates, proteins etc.

➢ Balanced Diet

- Requisites of an adequate diet.
- Role of carbohydrates, fats, proteins, minerals, vitamins and water indiet.
- Principles of nutrition as applied to medical problems
- Biotechnology and concepts of molecular biology with special emphasis on use of recombinant DNA techniques in medicine and the molecular biology of cancer.

➢ Pharmacology

- The Evolution of Medical Drugs
- British Pharmacopia
- Introduction to Pharmacology
- Receptors
- Mechanisms of Drug Action
- Pharmacokinetics
- Pharmacokinetic Process
- Absorption
- Distribution
- Metabolism
- Desired Plasma Concentration
- Volume of Distribution
- Elimination
- Elimination rate constant and half life
- Creatinine Clearance

- Drug Effect
- Beneficial Responses
- Harmful Responses
- Allergic Responses
- Drug Dependence, Addiction, Abuse and Tolerance
- Drug Interactions
- Drug use in pregnancy and in children
- Autonomic Pharmacology
- Basic concepts of pharmacokinetics and dynamics of:
- Pharmacology of drugs used in GI disorders e.g. antacids, motilitydrugs, anti H. pylori therapy, drugs controlling other GI secretions, Ulcerative colitis and immunosuppressive drugs.
- Immunopharmacology
- Chemotherapy
- Antibacterial, antimycobacterial, antiviral, antifungal and antiparasitic
- Vitamins and Antioxidants

➢ Pathology

- Pathological alterations at cellular and structural level along with brief introduction of Basic Microbiology and Hematological pathology as related to medicine

➢ Cell Injury and adaptation

- Reversible and Irreversible Injury
- Fatty change, Pathologic calcification
- Necrosis and Gangrene
- Atrophy, Hypertrophy, Hyperplasia, Metaplasia, Aplasia

Inflammation

- **Acute inflammation**
  - Cellular components and chemical mediators of acuteinflammation
  - Exudates and transudate
  - Sequelae of acute inflammation
- **Chronic inflammation**
  - Etiological factors and pathogenesis
  - Distinction between acute and chronic (duration)inflammation
  - Histologic hallmarks
  - Types of chronic inflammation, non-granulomatous andgranulomatous, and their causes
  - Sequelae of acute inflammation
- **Chronic inflammation**
  - Etiological factors and pathogenesis
  - Distinction between acute and chronic (duration)inflammation
  - Histologic hallmarks
  - Types of chronic inflammation, non-granulomatous and granulomatous, and their causes
- **Hemodynamic disorders**
  - Etiology, pathogenesis, classification and morphological and clinical manifestations of Edema, Haemorrhage, Thrombosis,Embolism, Infarction & Hyperaemia
  - Shock; classification etiology, and pathogenesis, manifestations.
  - Describe the compensatory mechanisms involved in shock
  - Describe the pathogenesis and possible consequences of thrombosis
  - Describe the difference between arterial and venous emboli
- **Neoplasia**
  - Dysplasia and Neoplasia
  - Benign and malignant neoplasms
  - Etiological factors for neoplasia
  - Different modes of metastasis
  - Tumor staging system and tumor grade

➢ Immunity and Hypersensitivity

- Immunity
- Immune response
- Diagnostic procedures in a clinical microbiology laboratory
- Protective immunity to microbial diseases
- Tumor immunology
- Immunological tolerance, autoimmunity and autoimmune diseases.
- Transplantation immunology
- Hypersensitivity
- Immunodeficiency disorders
- Immunoprophylaxis & Immunotherapy

➢ Haematopathology

- Normal blood picture & variation in disease

➢ Microbiology

- A brief account of the classification of microorganisms.
- Role of Microbes In Various Human Diseases
- Infection source Bacterial

Growth and Death

- Names, habitat, modes of transmission/infection, pathogenic mechanism and pathological changes produced by bacteria, commonly causing human diseases in Pakistan
- Names of bacteria and diseases produced by bacteria not commonly found in Pakistan.
- Morphology: Identification of various shapes of bacteria and Viruses under the microscope.
- Distribution, size, motility, reproduction and functions of bacteriaand viruses.
- Gram staining and AFB staining, Culture of blood and fluid; details regarding methodology in collection, transportation and preservation.
- Culture media for common pathogens and methods of culture.
- Special culture media. Basis of sensitivity tests.

Fungal Diseases

- Names, general morphological features, and diseases produced by Fungi commonly found in Pakistan, including dermatophytes, Maduro mycosis and opportunistic infections.

Important Parasites;

- Names and modes of infection of parasitic diseases commonly found in Pakistan including amoebiasis, malaria, leishmaniosis, ascariasis, cestodiasis, ankylostomiasis, giardiasis, hydatid disease and guinea worm disease.
- Important Viruses
- Sterilization and disinfection
- Immunization
- Nosocomial Infections
- Use of investigation and procedures in laboratory
- Saliva, stool, cerebrospinal fluid(CSF), pus, aspirate

MD Gastroenterology
Basic Principles of Internal Medicine

After 6 months of Induction period in Gastroenterology the resident shall start next 18 months Internal Medicine training. Resident should get exposure in the following organ and system competencies (listed below) while considering and practicing each system in terms of: -

- Medical ethics
- Professional values, student teachers relationship
- Orientation of in-patient, out-patients and Gastroenterological labs
- Approach to the patient
- History taking
- General physical examination
- Systemic examination
- Routine investigations
- Special investigations
- Diagnostic and therapeutic procedures

Course Contents

Cardiovascular Medicine

- *Common and / or important Cardiac Problems:*
- Arrhythmias
- Ischemic Heart Disease: acute coronary syndromes, stable angina, atherosclerosis
- Heart Failure
- Hypertension – including investigation and management of accelerated hypertension
- Valvar Heart Disease
- Endocarditis
- Aortic dissection
- Syncope
- Dyslipidemia
- *Clinical Science:*
- Physiological principles of cardiac cycle and cardiac conduction
- Pharmacology of major drug classes: beta blockers, alpha blockers, ACE inhibitors, Angiotensin receptor blockers (ARBs), anti-platelet agents, thrombolysis, inotropes, calcium channel antagonists, potassium channel activators, diuretics, anti-arrhythmic, anticoagulants, lipid modifying drugs, nitrates, centrally acting anti-hypertensives

Dermatology

Common and / or Important Problems:

- Cellulitis
- Cutaneous drug reactions
- Psoriasis and eczema
- Skin failure: eg erythroderma, toxic epidermal necrolysis
- Urticarial and angioedema
- Cutaneous vasculitis
- Herpes zoster and Herpes Simplex infections
- Skin tumors
- Skin infestations
- Dermatomyositis
- Scleroderma
- Lymphedema

- **Clinical Science:**
  - Pharmacology of major drug classes: topical steroids, immunosuppressant

Diabetes & Endocrine Medicine

- **Common and / or Important Diabetes Problems:**
  - Diabetic ketoacidosis
  - Non-acidotic hyperosmolar coma / severe hyperglycemia
  - Hypoglycemia
  - Care of the acutely ill diabetic
  - Peri-operative diabetes care
- **Common or Important Endocrine Problems:**
  - Hyper/Hypocalcaemia
  - Adrenocortical insufficiency
  - Hyper/Hyponatremia
  - Thyroid dysfunction
  - Dyslipidemia
  - Endocrine emergencies: myxedemic coma, thyrotoxicosis crisis, Addisoniancrisis, hypopituitary coma, phaeochromocytoma crisis
- **Clinical Science:**
  - Outline the function, receptors, action, secondary messengers and feedbackof hormones
  - Pharmacology of major drug classes: insulin, oral anti-diabetics, thyroxine, Anti-thyroid drugs, corticosteroids, sex hormones, drugs affecting bonemetabolism

Renal Medicine

- **Common and / or Important Problems:**
  - Acute renal failure
  - Chronic renal failure
  - Glomerulonephritis
  - Nephrotic syndrome
  - Urinary tract infections
  - Urinary Calculus
  - Renal replacement therapy
  - Disturbances of potassium, acid/base, and fluid balance (and appropriateacute interventions)

- **Clinical Science:**
  - Measurement of renal function
  - Metabolic perturbations of acute, chronic, and end-stage renal failure and associated treatments

Respiratory Medicine

- **Common and / or Important Respiratory Problems:**
  - COPD
  - Asthma
  - Pneumonia
  - Pleural disease: Pneumothorax, pleural effusion, mesothelioma
  - Lung Cancer
  - Respiratory failure and methods of respiratory support
  - Pulmonary embolism and DVT
  - Tuberculosis
  - Interstitial lung disease
  - Bronchiectasis
  - Respiratory failure and cor-pulmonale
  - Pulmonary hypertension
- **Clinical Science**
  - Principles of lung function measurement Pharmacology of major
- **Drug classes:**
  - Bronchodilators, inhaledcorticosteroids, leukotriene receptor antagonists, immunosuppressant

Allergy

- ***Common or Important Allergy Problems***
  - Anaphylaxis
  - Recognition of common allergies; introducing occupation associated allergies
  - Food, drug, latex, insect venom allergies
  - Urticarial and angioedema
- ***Clinical Science***
  - Mechanisms of allergic sensitization: primary and secondary prophylaxis
  - Natural history of allergic diseases
  - Mechanisms of action of anti-allergic drugs and immunotherapy
  - Principles and limitations of allergen avoidance

Hematology

- ***Common and / or Important Problems:***
  - Bone marrow failure: causes and complications
  - Bleeding disorders: DIC, hemophilia
  - Thrombocytopenia
  - anticoagulation treatment: indications, monitoring, management of over-treatment
  - Transfusion reactions
  - Anemia: iron deficient, megaloblastic, hemolysis, sickle cell,
  - Thrombophilia: classification; indications and implications of screening
  - Hemolytic disease
  - Myelodysplastic syndromes
  - Leukemia
  - Lymphoma
  - Myeloma
  - Myeloproliferative disease
  - Inherited disorders of hemoglobin (sickle cell disease, thalassemia)
  - Amyloid
- ***Clinical Science:***
  - Structure and function of blood, reticuloendothelial system, erythropoietintissues

Immunology

- ***Common or Important Problems:***
  - Anaphylaxis (see also 'Allergy')
- ***Clinical Science:***
  - Innate and adaptive immune responses
  - Principles of Hypersensitivity and transplantation

Infectious Diseases

- ***Common and / or Important Problems:***
  - Fever of Unknown origin
  - Complications of sepsis: shock, DIC, ARDS
  - Common community acquired infection: LRTI, UTI, skin and soft tissue infections, viral exanthema, gastroenteritis
  - CNS infection: meningitis, encephalitis, brain abscess

- HIV and AIDS including ethical considerations of testing
- Infections in immuno-compromised host
- Tuberculosis
- Anti-microbial drug monitoring
- Endocarditis
- Common genitor-urinary conditions: non-gonococcal urethritis, gonorrhea, syphilis

➢ ***Clinical Science:***

- Principles of vaccination
- Pharmacology of major drug classes: penicillin, cephalosporin, tetracycline, aminoglycosides, macrolides, siphon
- mides, quinolones, metronidazole, anti-tuberculous drugs, anti-fungal, anti-malarial, anti- helminthic, anti-viral

Medicine in the Elderly

➢ ***Common or Important Problems:***

- Deterioration in mobility
- Acute confusion
- Stroke and transient ischemic attack
- Falls
- Age related pharmacology
- Hypothermia
- Continence problems
- Dementia
- Movement disorders including Parkinson's disease
- Depression in the elderly
- Osteoporosis
- Malnutrition
- Osteoarthritis

➢ ***Clinical Science:***

- Effects of ageing on the major organ systems
- Normal laboratory values in older people

Musculoskeletal System

- ***Common or Important Problems:***
  - Septic arthritis
  - Rheumatoid arthritis
  - Osteoarthritis
  - Seronegative arthritides
  - Crystal arthroplasty
  - Osteoporosis – risk factors, and primary and secondary prevention of complications of osteoporosis
  - Polymyalgia and temporal arteritis
  - Acute connective tissue disease: systemic lupus erythematosus, scleroderma, poly- and dermatomyositis, Sjogren's syndrome, vasculitis
- ***Clinical Science:***
  - Pharmacology of major drug classes: NSAIDS, corticosteroids, immunosuppressant, colchicine, allopurinol, bisphosphonates

Neurology

- ***Common or Important Problems:***
  - Acute new headache
  - Stroke and transient ischemic attack
  - Subarachnoid hemorrhage
  - Coma
  - Central Nervous System infection: encephalitis, meningitis, brain abscess
  - Raised intra-cranial pressure
  - Sudden loss of consciousness including seizure disorders (see also abovesyncope etc)
  - Acute paralysis: Guillain-Barre, myasthenia gravis, spinal cord lesion
  - Multiple sclerosis
  - Motor neuron disease

- ***Clinical Science:***
  - Pathophysiology of pain, speech and language
  - Pharmacology of major drug classes: anxiolytics, hypnotics inc. benzodiazepines, antiepileptic, anti-Parkinson's drugs (anti-muscarinic, dopaminergic)

Psychiatry

- ***Common and /or Important Problems:***
  - Suicide and Para suicide
  - Acute psychosis
  - Substance dependence
  - Depression
- ***Clinical Science:***
  - Principles of substance addiction, and tolerance
  - Pharmacology of major drug classes: anti-psychotics, lithium, tricyclic antidepressants, mono-amine oxidase inhibitors, SSRIs, venlafaxine, Donepezil, drugs used in treatment of addiction (bupropion, disulphiram,acamprosate, methadone)

Cancer and Palliative Care

- ***Common or Important Gastroenterology Problems:***
  - Hypercalcemia
  - SVC obstruction
  - Spinal cord compression
  - Neutropenic sepsis
  - Common cancers (presentation, diagnosis, staging, treatment principles):lung, bowel, breast, prostate, stomach, esophagus, bladder)
- ***Common or Important Palliative Care Problems:***
  - Pain: appropriate use, analgesic ladder, side effects, role of radiotherapy
  - Constipation
  - Breathlessness
  - Nausea and vomiting
  - Anxiety and depressed mood
- Clinical Science:
  - Principles of oncogenesis and metastatic spread
  - Apoptosis
  - Principles of staging
  - Principles of screening
  - Pharmacology of major drug classes in palliative care: anti-emetics, opioids,NSAIDS, agents for neuropathic pain, bisphosphonates, laxatives, anxiolytics

Clinical Genetics

- *Common and / or Important problems:*
  - Down's syndrome
  - Turner's syndrome
  - Huntington's disease
  - Haemochromatosis
  - Marfan's syndrome
  - Klinefelter's syndrome
  - Familial cancer syndromes
  - Familial cardiovascular disorders

- *Clinical Science:*
  - Structure and function of human cells, chromosomes, DNA, RNA and cellularproteins
  - Principles of inheritance: Mendelian, sex-linked, mitochondrial
  - Principles of pharmacogenetics
  - Principles of mutation, polymorphism, trinucleotide repeat disorders
  - Principles of genetic testing including metabolite assays, clinical examinationand analysis of nucleic acid (e.g. PCR)

Clinical Pharmacology

- *Common and / or Important problems:*
  - Corticosteroid treatment: short and long-term complications, bone protection, safe withdrawal of corticosteroids, patient counselling regarding avoid adrenal crises
  - Specific treatment of poisoning with:
  - Aspirin,
  - Paracetamol
  - Tricyclic anti-depressants
  - Beta-blockers
  - Carbon monoxide
  - Opiates
  - Digoxin
  - Benzodiazepines
- ***Clinical Science:***
  - Drug actions at receptor and intracellular level
  - Principles of absorption, distribution, metabolism and excretion of chemotherapeutic and palliative drugs
  - Effects of genetics on drug metabolism
  - Pharmacological principles of drug interaction

- Outline the effects on drug metabolism of: pregnancy, age, renal and liver impairment

Investigation Competencies

- ***Outline the Indications for, and Interpret the Following Investigations:***
  - Basic blood biochemistry: urea and electrolytes, liver function tests, bone biochemistry, glucose, magnesium
  - Inflammatory markers: CRP / ESR
  - Arterial Blood Gas analysis
  - Cortisol and short Snatched test
  - HbA1C
  - Lipid profile
  - Amylase
  - Full blood count
  - Coagulation studies
  - Hemolysis studies
  - D dimer
  - Blood film report
  - Blood / Stool / urine culture
  - Fluid analysis: peritoneal, ascetic
  - Abdominal and pelvic radiograph
- ***More Advanced Competencies;***
  - Viral hepatitis serology
  - HIV testing
  - Ultrasound
  - Detailed imaging: Barium studies, CT, CT Gastroenterological angiography,high resolution CT, MRI
  - Ambulatory blood pressure monitoring

Procedural Competencies

- The trainee is expected to be competent in performing the following procedures by the end of core training. The trainee must be able to outline the indications for these interventions. For invasive procedures, the trainee must recognize the indications for the procedure, the importance of valid consent, aseptic technique, and safe use of local anesthetics and minimization of patient discomfort.
- Venipuncture
- Cannula insertion, including large bore
- Ascetic tap and aspiration
- Abdominal paracentesis
- Central venous cannulation
- Initial airway protection: chin lift, Guedel airway, nasal airway, laryngealmask
- Basic and, subsequently, advanced cardiorespiratory resuscitation
- Cytology: ascetic fluid, saliva
- Nasogastric tube placement and checking
- Enter scope insertion and monitoring
- Urethral catheterization

Specialty training in Gastroenterology

➢ Specific Program Content

- Specialized training in Gastroenterology
- Compulsory rotations
- Research & thesis writing
- Maintaining of Log-book

UPPER GASTROINTESTINAL DISORDERS

➢ Esophageal Disorders

- Motility of the esophagus and motor disorders
- Mechanism of deglutition and dysphagia
- Achalasia, diffuse esophageal spasm and other spastic disorders,
- Non-cardiac chest pain
- Approach to a patient with dysphagia
- Gastro-esophageal reflux disease
- Tumors of the esophagus
- Esophageal webs, membranes and diverticulum
- Management of benign and malignant esophageal strictures
- Dysplasia and endoscopic management
- Rumination syndrome, belching, aerophobia, Hiccups, evaluation
- Esophagus and systemic diseases
- Infectious diseases of the esophagus
- Foreign bodies in the esophagus and stomach
- Esophageal perforation
- Drug induced esophagitis

➢ Gastric Disorders

- Physiology of acid and bicarbonate secretion in health and disease
- Defense mechanisms against acid and pepsin
- Gastroduodenal motor function in health and diseases.
- Gastritis (nonspecific and specific)
- Helicobacter pylori infection
- Peptic ulcer
- Dyspepsia
- Stress and stomach
- Gastric hyper secretory states including Zollinger Ellison syndrome
- Ulcer complications and their management
- Surgery for peptic ulcer
- Post gastrectomy complication
- Bezoars
- Tumors of the stomach including gastric polyps and gastric carcinoids
- Diverticula and hernia of the stomach

LOWER GASTROINTESTINAL DISORDERS

Small Intestinal Disorders

- Motility of the small intestine
- Congenital anomalies
- Normal absorption of the nutrients
- Intestinal electrolyte absorption and secretion
- Malabsorption syndromes
- Pathophysiology, manifestations and approach
- Celiac sprue
- Infection related diseases
- Intestinal microflora in health and diseases
- Tropical sprue
- Whipple's disease
- Infectious diarrhea and food poisoning
- Parasitic diseases
- Small intestinal ulcers
- Short bowel syndrome and intestinal transplantation.
- Eosinophilic gastroenteritis
- Food allergies
- Intestinal obstruction
- Intestinal pseudo-obstruction and scleroderma
- Irritable bowel syndrome and functional GI disorders
- Disorders of nutrient assimilation/malnutrition
- Acute appendicitis
- Malrotation of the gut
- Bezoars
- Management of diarrhea
- GI lymphomas
- Small intestinal tumors

Colonic Disorders

- Motility of the colon and disorders of motility
- Congenital anomalies
- Megacolon
- Constipation
- Colonic pseudo-obstruction
- Fecal incontinence
- Antibiotic associated diarrhea

- Inflammatory bowel disease
- Ulcerative colitis
- Crohn's disease
- Indeterminate colitis
- Ileostomies and its management
- Diverticular disease and complications/diverticulitis
- Radiation entero-colitis
- Colonic polyps and polyposis syndromes
- Malignant diseases of the colon
- Colon cancer and screening
- Polyp surveillance, malignant polyps/serrated adenomas
- Constipation, pelvic floor dysfunction, evaluation and management
- Endoscopic resection of colorectal polyps, guidelines and management
- Familial colorectal cancer
- Evidence based guidelines for post-colon cancer management and guidelines

➢ Other small bowel and colonic diseases

- Constipation and pelvic floor dysfunction
- Small bowel bacterial overgrowth syndrome
- Collagenous and microscopic colitis
- Nonspecific ulcerations of the colon
- Malakoplakia
- Pneumatizes cystoids intestinalis
- Microscopic colitis
- Radiation colitis and enteritis
- Solitary rectal ulcer syndrome
- Diversion colitis
- Graft vs host disease
- Diseases of the anorectum
- Hemorrhoids and anal fissure
- Anal canal benign and malignant diseases
- Fecal incontinence and evaluation, fecal impaction

➢ Gastrointestinal immune disorders and infections

- Retroviral, mycotic, and parasitic diseases
- C-difficile infection and management of recurrent disease
- Celiac sprue
- Eosinophilic GI disorder/allergic GI disorder
- GI involvement in autoimmune disorders

➢ Vascular Diseases of the GI Tract

- Mesenteric ischemia
- Acute ischemic colitis/chronic mesenteric ischemia
- Portal venous thrombosis

➢ Pediatric Gastroenterology

- IBD issues in pediatric population
- Neonatal jaundice, and cholestasis
- Common pediatric gastrointestinal problems:
- Abdominal pain, constipation, diarrhea, cystic fibrosis necrotizing enterocolitis, Meckel's diverticulum, intestinal intussusception, and mid-gut volvulus
- GI complications of malignancy and treatment
- Rickets and other systemic disorders in GI and liver diseases

➢ Geriatric Gastroenterology

- Endoscopic gastrostomy tube risks and complications
- Evaluation and risks of endoscopic procedures among elderly
- Effect of aging on gastrointestinal tract and common GI illness among elderlypopulation

➢ Parenteral and Enteral Nutrition

- General indications and contraindications for parenteral and enteral nutrition.
- Utility of central and peripheral parenteral nutrition including advantagesand disadvantages.
- IV access utilized in parenteral nutrition.
- Major components of nutritional assessments and demonstrate the calculations for the usual requirements of fluids, carbohydrates, protein, fat and calories.
- Parenteral nutrition formula for a given patient.
- Advantages and disadvantages of total nutrient admixture system.
- Application of transitional therapy as it applies to parenteral nutrition.
- Rationale and benefit of early enteral feeding.
- Differences in macronutrients available in enteral formulas.
- Benefits that enteral products with fiber provide.
- Advantages/disadvantages of polymeric, partially hydrolyzed and disease specific formulas.
- Formula osmolality and its effect on enteral feeding tolerance.
- Indications and advantages and disadvantages of the following

accessroutes: nasogastric, gastrostomy and jejunostomy.
- Difference between continuous and intermittent feedings, including Advantages, disadvantages and general administration protocols.
- Complications of parenteral and enteral nutrition including mechanical,gastrointestinal, infectious and metabolic.
  Monitoring guidelines for parenteral and enteral nutrition

Gastrointestinal Oncology

- ***Esophageal cancer***
  - Risk factors
  - Indications for endoscopy in diagnosis and staging
  - Indications for nutritional support
  - Importance of combined modality therapy
  - Role of palliative chemotherapy and other supportive measures
- ***Gastric cancer***
  - Risk factors
  - Major surgical approaches to the disease and potentially curative role ofcombined modality therapy
  - Role of palliative chemotherapy and other supportive measure
- ***Colon cancer***
  - Risk factors and rationale for screening of colorectal cancer, as well as itschemoprevention
  - Role of genetic testing in colorectal cancer
  - Surgical staging
  - Indications for adjuvant therapies in colon and rectal cancers and role ofchemotherapy in advanced metastatic disease
  - Heritable types of colon cancer and differences in their pattern of spread andmanagement
  - GI stromal tumors
  - HIV related malignancy
- ***Anal cancer***
  - Association of human papilloma virus and anal cancer
  - Role of combined modality therapy in organ preservation
- ***Hepatobiliary cancers***
  - Epidemiology and risk factors
  - Role of alpha-fetoprotein in diagnosis, response assessment and screening of hepatobiliary cancers
  - Indications for curative role of surgery in localized disease
  - Role of systemic and intra-arterial chemotherapy

- ***Pancreatic cancer***
  - Risk factors
  - Genetic aspects of pancreatic cancer
  - Role of endoscopy
  - Role of molecular diagnosis
  - Curative role of surgery in rare patients and palliation in others
  - Palliative role of chemotherapy in advanced disease

- **Techniques used in the investigation of gastrointestinal cancers**
  - Flow cytometry
  - Polymerase chain reaction assays
  - Mutation analysis
  - Methylation assays
  - DNA sequencing and linkage analysis

- **Clinical Pharmacology of Gastrointestinal Disorders:**
  - Structure/activity relationships and physiochemical properties relating to agents used in the treatment of following common GI disorders:
  - Dosage schedules used in the treatment and maintenance of peptic ulcer disease and NSAID-induced ulcers.
  - Anti-secretory effects of H2-receptor antagonists, proton pump inhibitors, anticholinergics, and prostaglandins, antacids and antibacterial in the treatment and management of peptic ulcer disease and NSAID-inducedulcers.
  - Significance of side effects/adverse reactions and drug interactions of anti - ulcer medications.
  - Rational pharmacologic treatment plan for preventing the complications of Stress related mucosal damage
  - Monitoring plan, including efficacy and toxicity profile for the prophylactic regimen chosen.
  - Mechanism of action, doses, adverse drug reactions, drug interactions, clinical efficacy for the available drug therapy for GERD.
  - Classifications and histological abnormalities of drug induced liver disease
  - Treatment modalities for hepatic diseases and complications.
  - Prophylaxis including doses for acute viral hepatitis.
  - Drugs causing acute pancreatitis.
  - Role of non-pharmacologic and pharmacologic treatment modalities in the management of acute and chronic pancreatitis.
  - Appropriate pharmacologic treatmentsfor the management of fluiddepletion, electrolyte derangements, pain, chronic nutritional

deficiencies and malabsorption experienced by patients with acute and chronicpancreatitis.

- Structure/activity relationships and physiochemical properties relating to agents used in the treatment of pancreatitis
- Role of corticosteroids and sulfasalazine in managing IBD with indications for This agent in IBD, proposed mechanism(s) of action, recommend dosages at various stages of the disease and untoward effects associated with their use.

- Immunosuppressive (i.e. azathioprine, cyclosporine), infliximab, immune adjuvants (i.e. levamisole), mast cell stabilizers (i.e., commonly sodium) in the treatment of IBD.
- Metronidazole and antidiarrheal agents such as anticholinergics, antispasmodics and bile salt binding resins in IBD.
- Proposed mechanism of action, site of action, efficacy and side effects of the following antiemetic drugs:
- Phenothiazine
- Benzodiazepines
- Antihistamines
- Anticholinergics
- Ondansetron
- Cannabinoids
- Metoclopramide
- Corticosteroids
- Potential benefits of combining two or more antiemetic agents and give examples
- Drugs that are known to cause constipation and diarrhea.
- Non-pharmacologic management of complications or causes of diarrhea and constipation.
- Mechanisms of action, doses, adverse effects, and drug interactions of medications used in the management of diarrhea and constipation.
- Appropriate questions to ask a patient being assessed for diarrhea or constipation.

GI Radiology

- Reading and interpreting the common x-ray films including X-ray films of theabdomen
- Barium studies, ultrasound examination
- CT scans, MR scans and angiography and ERCP films
- CT Colonography
- CT enterography
- PET Scan

Endoscopic Training

- Endoscopes and accessories
- Sterilization of endoscopes and accessories
- Other electrosurgical instrument
- Consent and pre-procedure patient evaluation
- Sedation and monitoring
- Advance endoscopic technique
- Capsule endoscopy
- Double balloon enteroscopy, single fiber endoscopy, narrow band imagingand confocal (high magnification endoscopy)
- Anticoagulants and antiplatelet agents and GI endoscopy
- Complications of endoscopic procedures

Clinical/Laboratory Tests for GI Structure and Function

- Esophageal, gastric and ano-rectal function tests ; esophageal pH monitoring, esophageal and ano- rectal motility/manometry, gastric emptying studies
- Gastric secretion tests ; relevance of 24h intragastric H+ concentration, maximal acid output, effect of Penta gastrin and gastrin releasing peptide
- Tests for malabsorption ; SeHCAT, PABA, lactose breath H2, lactulose breath H2, faucal elastase
- Tests for inflammation ; serological and nuclear medicine testing including Tc WBC scans
- Radiological evaluation ; Plain x-rays of abdomen, barium studies of GI tract CT, MRI and ultrasound
- Histopathology evaluation ; Histological features of common gastrointestinal and liver disease with appreciation of the histological findings in discussion with histopathologists

Common gastrointestinal manifestations:

- Anorexia and weight loss
- Nausea and Vomiting
- Cyclical vomiting in adults and idiopathic nausea
- Dysphagia and non-cardiac chest pain
- Upper abdominal pain/dyspepsia
- Peptic ulcer type dyspepsia
- Gall bladder type dyspepsia
- Non ulcer dyspepsia
- Steatorrhea Malabsorption
- Gastrointestinal Bleeding
- Evaluation of anemia
- Iron deficiency anemia
- Macrocytic anemia
- Short bowel syndrome/ ileostomy diarrhea
- Acute abdominal pain
- Chronic abdominal pain
- The spectrum of functional bowel disorders including burden of disease, sub types and etiological factors.
- Esophageal Dysmotility
- Functional dyspepsia -
- Epigastric pain syndrome
- Postprandial distress syndrome
- Irritable bowel syndrome and its subtypes
- Diarrhea/Constipation
- Obstructive defecation, proctalgia fugal
- Change in bowel habit
- Rectal bleeding and perianal fistulae
- Jaundice
- Hepatosplenomegaly and abdominal swelling
- Abdominal masses including cysts
- Confusion progressing to liver failure

Miscellaneous

- Gastrointestinal tuberculosis
- HIV and the GIT, hepatobiliary and pancreatic systems
- GIT and liver in systemic diseases
- Cutaneous manifestations of GI diseases

- Gastrointestinal side effects of drugs especially NSAIDs
- Management of GI emergencies in the acutely ill patient including ileus
- Foreign body management

HEPATOLOGY

➢ Hepatic Disorders

- Functions of the liver
- Microcirculation of liver
- Liver function tests
- Acute viral hepatitis
- Chronic hepatitis
- HBV resistance
- Treatment of viral hepatitis (B and C
- Fulminant hepatic failure
- Subacute hepatic failure
- Alcoholic liver disease
- Non-alcoholic fatty liver disease
- Spontaneous bacterial peritonitis and hepatorenal syndrome in liver failure
- Tips in the management of complications of liver disease
- Cirrhosis of liver
- Portal hypertension
- Extrahepatic Porto splenic vein obstruction
- Hepatic venous outflow tract obstruction
- Fibrocystic diseases of the liver
- Ascites
- Non cirrhotic portal fibrosis
- Drug and toxin induced liver disease
- Pregnancy related hepatobiliary disease
- Cholesteric syndromes (Primary and secondary sclerosing Cholangitis/primary biliary cirrhosis etc)
- Genetic liver diseases (hemochromatosis, alpha-1 antitrypsin deficiency, Wilson's disease)
- Metabolic liver disease
- Liver in porphyria
- Infections of the liver
- Liver in congestive heart failure
- Complication of chronic liver disease
- Autoimmune liver diseases
- Vascular disorders of liver (Budd-Chiari and ischemic/hypoxic hepatitis)

- Perioperative evaluation and management of liver disease patient
- Liver transplantation and artificial liver support
- Pre-transplant evaluation
- Management and evaluation of post-transplant patients
- Hepatocellular carcinoma/other hepatic malignancy
- Liver imaging modalities
- Liver biopsy

➢ Biliary Tract Disorders

- Physiology of bile formation and excretion
- Enterohepatic circulation
- Bilirubin metabolism.
- Approach to a patients with jaundice
- Gallstones, its complications, and management
- Acute calculous cholecystitis
- Miscellaneous disorders of the gallbladder
- Acute cholangitis
- Benign biliary stasis
- Benign and malignant neoplasms of the biliary system.
- Endoscopic management of biliary obstruction.
- Motility and dysmotility of the biliary system and sphincter of Oddi dysfunction
- Congenital diseases of the biliary systems

➢ Pancreatic Disorders

- Pancreatic function tests
- Acute pancreatitis
- Recurrent acute pancreatitis
- Chronic pancreatitis
- Idiopathic pancreatitis
- Nutritional support in acute and chronic pancreatitis
- Radiologic evaluation of pancreas and biliary tract
- Biliary dyskinesia/sphincter of Oddi dysfunction
- Pancreatic divisor
- Molecular genetic of hereditary pancreatic disorders
- Malignancies of the pancreas(Exocrine and endocrine)
- Cystic fibrosis and other childhood disorders of the pancreas
- Hereditary pancreatitis
- Pancreatic transplantation

Compulsory rotations in the relevant fields for 3-6 months

Clinical training experiences are described below:

- **Intensive Care Units**

  On this 3 months rotation, the resident shall develop competence in the differential diagnosis and management of the critically ill, and learn to integrate these clinical skills with the biomedical instrumentation of bedside hemodynamic measurements, right heart catheterization, measurement and computation of gas exchange variables, cardiac output determination, and all aspects of mechanical ventilation and airway care. These principles, and those governing fluid therapy, nutritional support, and antimicrobial therapy in severely ill patients, shall be reviewed extensively.

- **Outpatient Services**

  Gastroenterological outpatient training shall be provided during the entire residency in a continuity to review findings and to discuss patient care issues. Residents shall assume primary responsibility for managing their patients

- **Radiation Gastroenterology**

  The resident shall learn to prescribe and monitor the different doses and methods of radiation therapy in management of different types of malignance

- **Organ Transplantation**

  This popular rotation shall provide residents with an intense introduction to the selection of transplant candidates and the management of these patients after transplantation. Residents shall work with a dedicated group of organ transplant physicians and learn the indications, contraindications and the relative protocols and precautions required for these transplantations.

- **Gastroenterological Rehabilitation Rotation**

  This rotation shall expose residents to issues in rehabilitation of patients with chronic gastro enteric diseases

- **Elective experiences in Pathology and Laboratory Medicine**

  As well as Radiology and Infectious diseases center for 1 month each in the relevant departments

RESEARCH/ THESIS WRITING

➢ RESEARCH/ THESIS WRITING

Total of one year will be allocated for work on a research project with thesis writing. Project must be completed and thesis be submitted before the end of training. Research can be done as one block in 5th year of training or it can be stretched over five years of training in the form of regular periodic rotations during the course as longas total research time is equivalent to one calendar year.

➢ Research Experience

The active research component program must ensure meaningful, supervised research experience with appropriate protected time for each resident while maintaining the essential clinical experience. Recent productivity by the program faculty and by the residents will be required, including publications in peer-reviewed journals. Residents must learn the design and interpretation of research studies, responsible use of informed consent, and research methodology and interpretation of data. The program must provide instruction in the critical assessment of new therapies and of the surgical literature. Residents should be advised and supervised by qualified staff members in the conduct of research.

➢ Clinical Research

Each resident will participate in at least one clinical research study to become familiar with:

- Research design
- Research involving human subjects including informed consent and operations of the Institutional Review Board and ethics of human experimentation
- Data collection and data analysis
- Research ethics and honesty
- Peer review process

This usually is done during the consultation and outpatient clinic rotations.

- **Case Studies or Literature Reviews**

  Each resident will write, and submit for publication in a peer-reviewedjournal, a case study or literature review on a topic of his/her choice.

Laboratory Research

- ***Bench Research***

  Participation in laboratory research is at the option of the resident and may be arranged through any faculty member of the Division. When appropriate, the research may be done at other institutions.

- ***Research involving animals***
  - Each resident participating in research involving animals is required to:
  - Become familiar with the pertinent Rules and Regulations of the University i.e. those relating to "Health and Medical Surveillance Program for Laboratory Animal Care Personnel" and "Care and Use of Vertebrate Animals as Subjects in Research and Teaching"
  - Read the "Guide for the Care and Use of Laboratory Animals"
  - View the videotape of the symposium on Humane Animal Care

- ***Research involving Radioactivity***

  Each resident participating in research involving radioactive materials is required to
  - Attend a Radiation Review session
  - Work with an Authorized User and receive appropriate instruction From him/her.

METHODS OF INSTRUCTION/COURSE CONDUCTION

As a policy, active participation of students at all levels will be encouraged.Following teaching modalities will be employed:

- Lectures
- Seminar Presentation and Journal Club Presentations
- Group Discussions
- Grand Rounds
- Clinic-pathological Conferences
- SEQ as assignments on the content areas
- Skill teaching in ICU, emergency and ward settings
- Attend genetic clinics and rounds for at least one month.
- Attend sessions of genetic counseling
- Self-study, assignments and use of internet
- Bedside teaching rounds in ward
- OPD & Follow up clinics
- Long and short case presentations

In addition to the conventional teaching methodologies interactive strategies like conferences will also be introduced to improve both communication and clinical skills in the upcoming consultants. Conferences must be conducted regularly as scheduled and attended by all available faculty and residents. Residents must actively request autopsies and participate in formal review of gross and microscopic pathological material from patients who have been under their care. It is essential that residents participate in planning and in conducting conferences.

➢ Clinical Case Conference

Each resident will be responsible for at least one clinical case conference each month. The cases discussed may be those seen on either the consultation or clinic service or during rotations in specialty areas. The resident, with the advice of the Attending Physician on the Consultation Service, will prepare and present the case(s) and review the relevant literature.

➢ Monthly Student Meetings

Each affiliated medical college approved to conduct training for MD Gastroenterology will provide a room for student meetings/discussions such as:

➢ Journal Club Meeting

A resident will be assigned to present, in depth, a research article or topic of his/her choice of actual or potential broad interest and/or application. Two hours per month should be allocated to discussion of any current articles or topics introduced by any participant. Faculty or outside researchers will be invited to present outlines or results of current research activities. The article should be critically evaluated and its applicable results should be highlighted, which can be incorporated in clinical practice. Record of all such articles should be maintained in the relevant department.

➢ *Core Curriculum Meetings*

All the core topics of Gastroenterology should be thoroughly discussed during these sessions. The duration of each session should be at least two hours once a month. It should be chaired by the chief resident (elected by the residents of the relevant discipline). Each resident should be given an opportunity to brainstorm all topics included in the course and to generate new ideas regarding the improvement of the course structure

Skill Development

Two hours twice a month should be assigned for learning and practicing clinical skills.

➢ List of skills to be learnt during these sessions is as follows:

- Residents must develop a comprehensive understanding of the indications, contraindications, limitations, complications, techniques, and interpretation of results of those technical procedures integral to the discipline.
- Residents must acquire knowledge of and skill in educate ng patients about the technique, rationale and ramifications of procedures and in obtaining procedure-specific informed consent. Faculty supervision of residents in their performance is required, and each resident's experience in such procedures must be documented by the program director.
- Residents must have instruction in the evaluation of medical literature,

clinical epidemiology, clinical study design, relative and absolute risks of disease, medical statistics and medical decision-making.

- Training must include cultural, social, family, behavioral and economic issues, such as confidentiality of information, indications for life support systems, and allocation of limited resources.
- Residents must be taught the social and economic impact of their decisions on patients, the primary care physician and society. This can be achieved by attending the bioethics lectures and becoming familiar with Project Professionalism Manual such as that of the American Board of Internal Medicine.
- Residents should have instruction and experience with patient counseling skills and community education.
- This training should emphasize effective communication techniques for diverse populations, as well as organizational resources useful for patient and community education.
- Residents may attend the series of lectures on Nuclear Medicine procedures (radionuclide scanning and localization tests and therapy) presented to the Radiology residents.
- Residents should have experience in the performance of clinical laboratory and radionuclide studies and basic laboratory techniques, including quality control, quality assurance and proficiency standards.
- Each resident will observe and participate in each of the procedures, preferably done on patients firstly under supervision and then independently.

Annual Grand Meeting

Once a year all residents enrolled for MD Gastroenterology should be invited to the annual meeting at University

One full day will be allocated to this event. All the chief residents from affiliated institutes will present their annual reports. Issues and concerns related to their relevant courses will be discussed. Feedback should becollected and suggestions should be sought in order to involve residents in decision making.

The research work done by residents and their literary work may be displayed.

In the evening an informal gathering and dinner can be arranged. This will help in creating a sense of belonging and ownership among students and thefaculty.

LOG BOOK

The residents must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book should be part of the requirement to sit for MD examination. Log book should include adequate number of diagnostic and therapeutic procedures observed and performed, the indications for the procedure, any complications and the interpretation of the results, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

- **Proposed Format of Log Book is as follows:**

Candidate's Name: _____-

Supervisor_____

Roll No. _____

- **The procedures shall be entered in the log book as per format**

Residents should become proficient in performing the related procedures (pg.12,13,46,47). After observing the technique, they will be observed while performing the procedure and, when deemed competent by the supervising physician, will perform it independently. They will be responsible for obtaining informed consent, performing the procedure, reviewing the results with the pathologist and the attending physician and informing the patient and, where appropriate, the referring physician of the results.

Procedures Performed

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure Performed	Supervisor's Signature
1					
2					
3					
4					

Gastroenterological Emergencies Handled

Sr. #	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure/ Management	Supervisor's Signature
1					
2					
3					
4					

Case Presented

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Case Presented	Supervisor's Signature
1				
2				
3				
4				

Seminar/Journal Club Presentation

Sr.#	Date	Topic	Supervisor's Signature
1			
2			
3			
4			

Evaluation Record

(Excellent, Good, Adequate, Inadequate, Poor)

At the end of the rotation, each faculty member will provide an evaluation ofthe clinical performance of the fellow.

Sr.#	Date	Method of Evaluation (Oral, Practical, Theory)	Rating	Supervisor's Signature
1				
2				

EVALUATION & ASSESSMENT STRATEGIES

➢ Assessment

It will consist of action and professional growth oriented student-centered integrated assessment with an additional component of informal internal assessment, formative assessment and measurement-based summative assessment.

➢ Student-Centered Integrated Assessment

It views students as decision-makers in need of information about their own performance. Integrated Assessment is meant to give students responsibility for deciding what to evaluate, as well as how to evaluate it, encourages students to own the evaluation and to use it as a basis for self-improvement. Therefore, it tends to be growth-oriented, student-controlled, collaborative, dynamic, contextualized, informal, flexible and action-oriented.

➢ In the proposed curriculum, it will be based on:

- Self-Assessment by the student
- Peer Assessment
- Informal Internal Assessment by the Faculty

➢ Self-Assessment by the Student

Each student will be provided with a pre-designed self-assessment form to evaluate his/her level of comfort and competency in dealing with different relevant clinical situations. It will be the responsibility of the student to correctly identify his/her areas of weakness and to take appropriate measures to address those weaknesses.

➢ *Peer Assessment*

The students will also be expected to evaluate their peers after the monthly small group meeting. These should be followed by a constructive feedback According to the prescribed guidelines and should be non-judgmental in nature. This will enable students to become good mentors in future.

Informal Internal Assessment by the Faculty

There will be no formal allocation of marks for the component of Internal Assessment so that students are willing to confront their weaknesses rather than hiding them from their instructors. It will include:

- Punctuality
- Ward work
- Monthly assessment (written tests to indicate particular areas of weaknesses)
- Participation in interactive sessions

➢ Formative Assessment

Will help to improve the existing instructional methods and the curriculum inuse

➢ Feedback to the faculty by the students:

After every three months students will be providing a written feedback regarding their course components and teaching methods. This will help to identify strengths and weaknesses of the relevant course, faculty members and to ascertain areas for further improvement.

➢ Summative Assessment

It will be carried out at the end of the programme to empirically evaluate cognitive, psychomotor and affective domains in order to award degrees for successful completion of courses.

MD GASTROENTEROLOGY EXAMINATIONS

➢ Intermediate Examination MD Gastroenterology

All candidates admitted in MD Gastroenterology course shall appear inIntermediate examination at the end of 2nd calendar year.
At the end of 2nd Year of MD Gastroenterology Program.

Written Examination	= 300 Marks
Clinical, TOACS/OSCE & ORAL	= 200 Marks
Total	= 500 Marks

➢ Written:

MCQs	= 100 (2 marks each MCQ)	
SEQs	= 10 (10 Marks each SEQ)	
Total	**= 300 Marks**	
Principles of Internal Medicine	= 70 MCQs	7 SEQs
Specialty specific	= 10 MCQs	1 SEQs
Basic Sciences	= 20 MCQs	2 SEQs
• Physiology	= 8 MCQs	1 SEQ
• Pharmacology	= 4 MCQs	-------
• Pathology	= 8 MCQs	1 SEQ

➢ Clinical, TOACS/OSCE & ORAL

Four Short Cases	= 100 Marks
One Long Case	= 50 Marks
TOACS/OSCE & ORAL	= 50 Marks
Total	**= 200 Marks**

Final Examination MD GastroenterologyTotal Marks: 1500

All candidates admitted in MD course shall appear in Final examination at the end of structured training programmer (end of 5th calendar year) and after clearing Intermediate Examination.

There shall be two written papers of 250 marks each, Clinical, TOACS/OSCE & ORAL of 500 marks, Internal assessment of 100 marks and thesis examination of 400 marks.

➢ Topics included in paper 1

- Upper GI Disorders (35 MCQs)
- Lower GI Disorders (35 MCQs)
- Pediatric and Geriatric Gastroenterology (30 MCQs)

➢ Topics included in paper 2

- Hepatology (30 MCQs)
- GI Radiology and Other Diagnostic tests (15 MCQs)
- Gastrointestinal Oncology (20 MCQs)
- Parenteral and Enteral Nutrition (15 MCQs)
- Vascular, Infectious & Immune Disorders (20 MCQs)

Components of Final Examination

Theory

Paper I	**250 Marks**	**3 Hours**
5 SEQs	50 Marks	
100 MCQs	200 Marks	
Paper II	**250 Marks**	**3 Hours**
5 SEQs	50 Marks	
100 MCQs	200 Marks	

The candidates, who pass in theory papers, will be eligible to appear in theclinical, TOACS/OSCE & ORAL.

➢ Clinical, TOACS/OSCE & ORAL

Four short cases	200 Marks
One long case	100 Marks
TOACS/OSCE & ORAL	200 Marks

Continuous Internal Assessment **100 Marks**

Thesis Examination **400 Marks**

All candidates admitted in MD courses shall appear in Thesis examination at the end of 5th calendar year of the MD program. The examination shall include thesis evaluation with defense.

APPENDIX "E"

(See Regulation 9-iii)

MANDATORY WORKSHOPS

1. Each candidate of MD/MS/MDS program would attend the 04 mandatory workshops and any other workshop as required by the university.
2. The four mandatory workshops will include the following

   a. **Research Methodology and Biostatistics**
   b. **Synopsis Writing**
   c. **Communication Skills**
   d. **Introduction to Computer / Information Technology and Software programs**

3. The workshops will be held on 03 monthly basis.
4. An appropriate fee for each workshop will be charged.
5. Each workshop will be of 02 - 05 days duration.
6. Certificates of attendance will be issued upon satisfactory completion of workshops.

d. The acquisition of research skill will be assessed as per regulations governing thesis evaluation and its acceptance.

iii. **Practice and System Based Learning**

a. This competency will be learnt from journal clubs, review of literature, policies and guidelines, audit projects, medical error investigation, root cause analysis and awareness of healthcare facilities.

b. The assessment methods will include case studies, presentation in morbidity and mortality review meetings and presentation of audit projects if any.

c. These methods of assessment shall have equal weight-age.

iv. **Communication Skills**

a. These will be learnt from role models, supervisor and workshops.

b. They will be assessed by direct observation of the candidate whilst interacting with the patients, relatives, colleagues and with multisource feedback evaluation.

v. **Professionalism as per Hippocratic Oath**

a. This competency is learnt from supervisor acting as a role model, ethical case conferences and lectures on ethical issues such as confidentiality, informed consent, end of life decisions, conflict of interest, harassment and use of human subjects in research.

b. The assessment of residents will be through multisource feedback evaluation according to proformas of evaluation and its' scoring method.

Specialty Specific Competencies

i. The candidates will be trained in operative and procedural skills according to a quarterly based schedule.

ii. The level of procedural competen
will be according to a competency table to be developed by each specialty.

iii. The following key will be used for assessing operative and procedural competencies:

a. **Level 1 Observer status**

The candidate physically present and observing the supervisor and senior colleagues

b. **Level 2 Assistant status**
The candidate assisting procedures and operations

c. **Level 3 Performed under supervision**
The candidate operating or performing a procedure under direct supervision

d. **Level 4 Performed independently**
The candidate operating or performing a procedure without any supervision

iv. **Procedure Based Assessments (PBA)**

a. Procedural competency will assess the skill of consent taking, preoperative preparation and planning, intraoperative general and specific tasks and postoperative management

b. Procedure Based assessments will be carried out during teaching and training of each procedure.

c. The assessors may be supervisors, consultant colleagues and senior residents.

d. The standardized forms will be filled in by the assessor after direct observation.

e. The resident's evaluation will be graded as satisfactory, deficient requiring further training and not assessed at all.

f. Assessment report will be sub

g. A satisfactory score will be required to be eligible for taking final examination.

Multisource Feedback Evaluation

i. The supervisor would ensure a multisource feedback to collect peer assessments in medical knowledge, clinical skills, communication skills, professionalism, integrity, and responsibility.

ii. Satisfactory annual reports will be required to become eligible for the final examination

b) Completion Of Candidate's Training Portfolio

i. The Candidate's Training Portfolio (CTP) will be published (or computer based portfolio downloadable) by the university.
ii. The candidates would either purchase the CTP or download it from the KEMU web site.
iii. The portfolio will consist of the following components

a) Enrollment details.

b) Candidate's credentials as submitted on the application for admission form.

c) Timeline of scheduled activities e.g dates of commencement and completion of training, submission of synopsis and thesis, assessments and examination dates etc **(Appendix H)**

d) Log Book of case presentations, operations and procedures recorded in an appropriate format and validated by the supervisor.

e) Record of participation and presentations in academic activities e.g lectures, workshops, journal clubs, clinical audit projects, morbidity & mortality review meetings, presentation in house as well as national and international meetings.

f) Record of Publications if any.

g) Record of results of assessments and examinations if any

h) Synopsis submission proforma and IRB proforma and AS&RB approval Letter

i) Copy of Synopsis as approved by AS&RB

iv. Candidates Training Portfolio shall be assessed as per proforma given in **"Appendix-G".**

pervisor's Annual Review Report.

This report will consist of the following components:-

i. Verification and validation of Log Book of operations & procedures according to the expected number of operations and procedures performed (as per levels of competence) determined by relevant board of studies.

ii. A 90 % attendance in academic activities is expected. The academic activities will include: Lectures, Workshops other than mandatory workshops, Journal Clubs, Morbidity & Mortality Review Meetings and Other presentations.

iii. Assessment report of presentations and lectures

iv. Compliance Report to meet timeline for completion of research project.

v. Compliance Report on Personal Development Plan.

vi. Multisource Feedback Report, on relationship with colleagues, patients.

vii. Supervisor will produce an annual report based on assessments as per proforma in appendix-G and submit it to the Examination Department.

viii. 75 % score will be required to pass the Continuous Internal Assessment on annual review.

APPENDIX " G "

(See Regulation 9ix, 9xxiii-d, 10, 11, 14 & 16)

Supervisor's Evaluation

PROFORMA FOR CONTINUOUS INTERNAL ASSESSMENTS

1.	**Generic Competencies**		
	(Please score from 1 – 100. 75% shall be the pass marks)	**Component Score**	**Score achieved**
	i. Patient Care	20	
	ii. Medical Knowledge and Research	20	
	iii. Practice and System Based Learning		
	• Journal Clubs	04	
	• Audit Projects	04	
	• Medical Error Investigation and Root Cause Analysis	04	
	• Morbidity / Mortality / Review meetings	04	
	• Awareness of Health Care Facilities	04	
	iv. Communication Skills		
	• Informed Consent	10	
	• End of life decisions	10	
	v. Professionalism		
	• Punctuality and time keeping	04	
	• Patient doctor relationship	04	
	• Relationship with colleagues	04	
	• Awareness of ethical issues	04	
	• Honesty and integrity	04	
2.	**Specialty specific competencies**		
	Please score from 1 – 100. 75% shall be the pass marks		**Score achieved**
	Operative Skills / Procedural Skills		
3.	**Multisource Feedback Evaluation**(Please score from 1 – 100. 75% shall be the pass marks)		
4.	**Candidates Training Portfolio** (Please score from 1 – 100.75% shall be the pass marks)		
	(Please score from 1 – 100. 75% shall be the pass marks)	**Component Score**	**Score achieved**
	i. Log book of operations and procedures	25	
	ii. Record of participation and presentation in academic activities	25	
	iii. Record of publications	25	
	iv. Record of results of assessments and examinations	25	