

***Residency Program  
Doctor of Medicine (MD)  
Curriculum (Phase-B)***

***Hepatology***



**Bangabandhu Sheikh Mujib Medical University  
Dhaka, Bangladesh**

## C o n t e n t s

01.	Introduction	03
02.	Goals and Objectives	04
03.	Admission Requirements for Phase B Training	07
04.	Content (Syllabus) Outline: Detailed in section 11	07
05.	Teaching and Learning Methods	07
06.	Record of Training	10
07.	Research	11
08.	Assessment	12
09.	Supervision and Training Monitoring	17
10.	Curriculum Implementation, Review and Updating	18
11.	Phase B Syllabus	19
12.	Annexure 1	23
13.	Annexure 2	25

### 1. Introduction:

#### 1.1. Overview of the specialty

The field of Hepatology, including both the science and practice, encompasses a burgeoning knowledge base that has expanded substantially in the recent years. It has drawn the attention of medical professional as a separate entity in Bangladesh for huge burden of patients, scientific background and advancement of science in this subject world wide. Hepatology is a rapidly developing subject which requires supervised training and sound theoretical knowledge for acquiring competency in dealing with patients and to conduct academic activities and research.

Bangabandhu Sheikh Mujib Medical University, Shahbagh, Dhaka (BSMMU) was established in 1998. It is the center of excellence to ensure quality health care for the people by continuously improving the educational process and maintaining high standards for certifying internists and sub-specialists who acquire the knowledge, skill and attitudes essential for the provision of quality care. The university is assuring the highest quality patient care, professionalism and excellence in the practice of medicine, evidence – based medicine and intellectual drive, following standard evaluation procedures, high quality standard setting and maintaining autonomy to preserve these values. These could be achieved by residency based post graduate course.

#### 1.2 Program Overview

This curriculum of MD Hepatology provides a framework for developing an individual plan of study and growth that should be tailored to meet the needs of each individual trainee based on the strengths and special qualities of each individual training program. Regardless of the duration of training, the number of patients seen, or the number of procedures

performed, the ultimate goal must always remain excellent in all aspects of patient care, scholarship, and a commitment to lifelong learning. The curriculum will continue to evolve with time as new knowledge, methods of learning, novel techniques and technologies, and challenges arise.

The MD Hepatology course is of 5 years consisting of 2 phases. Phase A is of 2 years and Phase B is of 3 years duration.

## **2. Goals and Objectives:**

### **2.1 Goals**

1. The aim of the curriculum is to deliver a Program of training which when completed will enable the successful individual to practice independently as a Hepatologist.
2. The primary purpose of the curriculum is to provide a Program of training which, when successfully completed, will have skill with all of the competencies required to practice, will thus be able to offer specialist skills in Hepatology.
3. They will also have all of the core clinical and investigational skills.
4. The curriculum will enable trainees equally to have all the skills to assess and manage patients in clinics as well as inpatients.
5. They will be able to select investigations appropriately and have reached a standard of performance in gastrointestinal endoscopy that will enable them to practice these procedures independently.
6. Trainees will have acquired the skills to pass on their experience to the next generation be they undergraduate or postgraduate medical trainees or those in allied disciplines.

7. They will have acquired a portfolio of generic skills particularly those including leadership and management crucial not only to running a clinical service but also to developing that service.
8. Finally, they will be given such grounding in the specialty that will serve as a platform for Continued Professional Development in the context of life-long learning.

### **2.2. Learning Objectives**

1. The Hepatology consultants must possess a range of attributes, including a broad knowledge base, the ability to generate a relevant differential diagnosis based on an accurate history and physical examination, an understanding of the indications and contraindications for diagnostic and therapeutic procedures, skill at performing these procedures, the ability to think critically, and an appreciation of the humanistic and ethical aspects of medicine.
2. The resident will be able to provide compassionate and outstanding medical care to person with liver disease and to perform cutting – edge biomedical research to improve understanding of liver disease.
3. The resident will be efficient in establishing differential diagnosis for patients presenting with clinical features of liver disease by appropriate use of history, clinical examination and investigation. The trainee will be efficient to arrive at an appropriate differential diagnosis, outline a logical plan for specific and targeted investigations pertaining to the patient's complaints, and formulate a plan for management and follow-up treatment of the patient is critical. The ability to effectively present the results of a consultation orally and in writing and to defend the clinical

assessment, differential diagnosis, and diagnostic and management plans is essential.

4. Trainees must be able to provide patient care that is appropriate, effective and compassionate.
5. Trainees must be able to demonstrate procedural skills essential for the practice of Hepatology.
6. Trainees must demonstrate a core fund of knowledge in hepatic physiology, pathophysiology, clinical pharmacology, and related radiology.
7. Trainees must be able to investigate, evaluate, and improve their patient care practice by analyzing and assimilating both scientific evidence as well as their own prior experience into their practices. They should be able to apply knowledge of statistical methods to critically appraise clinical studies and be able to use information technology to support their own education. They must be involved in teaching and be able to facilitate the learning of other students and health care professionals.
8. Trainees must be able to demonstrate interpersonal and communication skills that result in effective information exchange with their patients, families, and other health care professionals. This would include, but not be limited to, verbal and written communication as a consultant that is accurate and timely. Trainees must be able to work effectively as members and leaders of the health care team.
9. Trainees must demonstrate must demonstrate ethical behavior, responsiveness, and sensitivity to a diverse gender, ethnic, socioeconomic, and aging patient population.
10. Trainees will learn research methodology up to the level that he can conduct clinical studies independently.

### **3. Admission Requirements for Phase B Training:**

- A. Residents who has successfully completed Phase A training in Medicine and Allied and passed Phase A Final Examination are eligible for enrolment in the Phase B Program.
- B. Candidates with FCPS/ MD in Internal Medicine can be enrolled directly into Phase- B of the residency Program.

### **4. Content (Syllabus) Outline: Detailed in section 11**

The training is designed to develop both the generic and Speciality attributes necessary to practice independently as a consultant Hepatologist. The aim is to train individuals to provide the highest standard of service to patients with liver, pancreatic and biliary disorders. This includes the development of possible attitudes towards lifelong learning and the ability to adopt future technological advances and the changing expectations of society.

#### **4.1 Educational Program:**

- 4.1.1 Applied Basic Sciences and applied Medical Sciences related to Hepatology with meaningful integration.
- 4.1.2 Hepatology Syllabus
- 4.1.3 Basic Courses on: Research Methodology and Medical Education

#### **4.2. Phase B Training Rotations:**

Three years training will be in the department of Hepatology with 6 blocks.

### **5. Teaching and Learning methods**

#### **5.1. Principal teaching / Learning Methods**

Supervised direct patient activities: Clinical training rotations. This curriculum is competency based; the duration of training is 3 years for phase B.

All training in Hepatology should be conducted in BSMMU. Training time must provide the necessary clinical exposure but also evidence that the required supervision and assessments can be achieved.

## **5.2. Learning Experiences:**

The curriculum will be delivered through a variety of learning experiences. Trainees will learn from practice, clinical skills appropriate to their level of training and to their attachment within the department.

This section identifies the types of situations in which a trainee will learn by the following ways:

### **5.2.1. Experiential learning opportunities:**

The content of work-based experiential learning includes active participation in:

- Medical clinics including specialty clinics. After initial induction, trainees will review patients in outpatient clinics and in patient ward, under direct supervision.
- Personal ward rounds: Every patient seen, on the ward or in out-patients, provides a learning opportunity, which will be enhanced by following the patient through the course of their illness.
- Consultant-led ward rounds. Every time a trainee observes another doctor, consultant or fellow trainee, seeing a patient or their relatives there is an opportunity for learning.
- Multi-disciplinary team meetings. There are many situations where clinical problems are discussed with clinicians in other disciplines. These provide excellent opportunities for observation of clinical reasoning. Such meetings include:

- X-Ray meetings
- Histology meetings
- Joint surgical meetings

Trainees have supervised responsibility for the care of in-patients. This includes day to-day review of clinical conditions, note keeping, and the initial management of the acutely ill patient with referral to and liaison with clinical colleagues as necessary. The degree of responsibility taken by the trainee will increase as competency increases. There should be appropriate levels of clinical supervision throughout training with increasing clinical independence and responsibility as learning outcomes are achieved

### **5.2.2. Training in practical procedures:**

Different Practical procedure eg liver biopsy, endoscopy lists including diagnostic/therapeutic endoscopy and colonoscopy. In all procedure and endoscopic modalities training should be undertaken in a supervised environment conducive to learning whereby trainees can develop competencies where the safety of the patient is of paramount importance.

### **5.2.3. Small group learning opportunities/ learning with peers:**

There will be small group learning in the form of tutorial classes and others. There are many opportunities for trainees to learn with their peers.

### **5.2.4. One to one teaching:**

This method of teaching may be practiced during physical examination of the patient under the guidance of supervisor.

**5.2.5. Regular formal teaching:**

There are many opportunities throughout the year for formal teaching sessions.

Suggested activities include:

- Case presentations
- Journal clubs
- Independent study
- Research and audit projects
- Lectures and small group teaching
- Grand Rounds
- Clinical skills demonstrations and teaching
- Critical appraisal and evidence based medicine and journal clubs
- Joint specialty meetings

**5.2.6. Personal study**

Trainees will use this time in a variety of ways depending upon their stage of learning. Suggested activities include:

- Reading, including web-based material.
- Maintenance of personal portfolio
- Audit and research projects
- Reading journals
- Achieving personal learning goals beyond the essential, core curriculum.

**5.2.7. Teaching others:**

Teaching of colleague is a very good way of learning. This could be achieved in independent study schedule, ward round and clinical management of patient in the ward.

**6. Record of Training:**

The evidence requires to confirm progress through training includes.

- Details of the training rotations. The training plan agreed with weekly timetables and duty rosters, and numbers of practical procedures and outcomes

- Confirmation of attendance at events in the education Program at departmental and interdepartmental meetings and others educational events.
- Confirmation (certificates) of attendance at subject-based/skills-training/instructional courses
- Recorded attendance at conference and meetings.
- A properly completed **logbook** with entries capable of testifying to the training objective which have been attained and the standard of performance achieved.
- CME achieved.
- Supervisor's on Observed performance (in the workplace) of duties. Practical procedures of presentations made and teaching activity of advising and working with others. Of standards of case notes. Correspondence and communication with others.

**6.1 Logbook:**

Residents are required to maintain a logbook in which entries of academic/professional work done during the period of training should be made on a daily basis, and signed by the supervisor completed and duly certified logbook will form a part of the application for appearing in Phase Final Examinations.

**6.2: Portfolio:**

Resident will have to maintain a portfolio during the Phase B course. It will contain POMR, discharge, referral, procedure, case presentation, journal presentation. At the end of every block Port Folio will have to be evaluated.

**7. Research:**

Research is a mandatory component of this training Program. Trainees in Hepatology will have to undertake a Program of research. Trainees must acquire research competencies, in

addition to those specified in their specialty curriculum. Every Resident shall work out on an assigned research project under the guidance of a recognized supervisor; the project shall be written and submitted in the form of a Thesis.

### **8. Assessment:**

The assessment for certification of the MD degree of the University is comprehensive, integrated and phase-centered attempting to identify attributes expected of specialists for independent practice and lifelong learning and covers cognitive, psychomotor and affective domains. It keeps strict reference to the components, the contents, the competencies and the criteria laid down in the curriculum. Assessment includes both **Formative Assessment and Summative (Phase final) Examinations.**

#### **8.1. Formative Assessment:**

Formative assessment will be conducted throughout the training phases. It will be carried out for tracking the progress of residents, providing feedback, and preparing them for final assessment (Phase completion exams).

There will be Continuous (day-to-day) and Periodic type of formative assessment.

- **Continuous (day-to-day) formative assessment** in classroom and workplace settings provides guide to a resident's learning and a faculty's teaching / learning strategies to ensure formative lesson / training outcomes.
- **Periodic formative assessment** is quasi-formal and is directed to assessing the outcome of a **block placement** or **academic module completion**. It is held at the end of Block Placement and Academic Module Completion. The contents of such examinations include **Block Units** of the Training Curriculum and **Academic Module Units** of the Academic Curriculum.

#### **8.1.1. End of Block Assessment (EBA):**

End of Block Assessment (EBA) is a periodic formative assessment and is undertaken after completion of each training block, assessing knowledge, skills and attitude of the residents. Components of EBA are written examination, structured clinical Assessment (SCA), medical record review, and logbook assessment. Unsatisfactory block training must be satisfactorily completed to be eligible for phase final examination

**8.1.2.** Formative assessment for Academic modules for Biostatistics and Research Methodology and Medical Education to be done in the first nine months of Phase B training. Residents getting unsatisfactory grade must achieve satisfactory grade by appearing the re-evaluation examination to be eligible for the Phase B Final Examination.

#### **8.2. Summative Examination:**

Assessment will be done in two broad compartments.

**a) Compartment A:** Consist of 3 (three) components.

1. Written Examination (Consisting of 2 papers).
2. Clinical Examination (One long and four short cases).
3. SCA and Oral (10 stations SCA, Oral one board consisting of 2 examiners).

Every Resident must pass all the 3 components of compartment-A separately. Candidates will be declared failed if he/she fails in one or more component (s) of the examination. He/she then have to appear all the 3 components in the next Phase B Final Examination.

**b) Compartment B:** Thesis and Thesis defense.

**8.2.1. Written Examination:**

**Two Papers: Contents of written papers listed in Annexure II**

**Question type and marks:**

- Two Papers (Paper I and Paper II); 100 marks each; Time 3 hrs for each paper. Pass marks-60% of total of 2 papers.
- **Each paper will consist of Two Groups:**
- **Group A:**
  - 10 short questions (5 marks each)
  - These will assess the knowledge of different level and its application
- **Group B:**
  - 5 scenario based problem solving questions (10 marks for each).
  - The questions should focus to assess the capability of handling clinical problem independently and comprehensively as a specialist.
  - Suggested format:-
    - A scenario followed by question(s).
    - Questions may include diagnosis, differential diagnosis, investigation plan, treatment, follow up and patient education.

**8.2.2. Clinical Examination: Long case and Short case:**

- There will be one long case and four short cases.
- i) **Long case: Marks-100**
  - Directly observed
  - Two examiners for each examinee.
  - History taking and examination by the examinee – 30min.
  - Discussion on the case 20 min.(presentation 6min, crossing 6x2min and decision 2min).

- Examiners will not ask any question nor stop the examinee in any way during history taking and physical examinations.
- Discussion should be done preferably as per structured format and proper weightage on different segments of clinical skills.
- ii) **Short cases : Marks-100**
  - Four in number
  - Time 20-30 min. (Time will be equally divided for each short case)
  - Crossing should be done with proper weightage on different segment of clinical skills.
- iii) **Pass marks: 60% of total of Long and Short Cases**

**8.2.3. Structured Clinical Assessment (SCA): Marks-100**

- 10 stations : 5 min each

**8.2.4. Oral Examination: Marks-100**

- One board consisting of 2 examiners.
- 20 minutes (9+9+2).

**8.2.5. Pass marks in SCA and Oral: 60% of total (SCA and Oral.)**

**8.3. Thesis Evaluation:**

- **Marks: Thesis writing-200; Defense-100: Marks for acceptance-60% of total.**
- To be evaluated by 3 (three) evaluators:- 2 subject specialists and one academician preferably involve in research and teaching research methodology.
- Among the subject specialists one should be external.
- Evaluators should be in the rank of Professor/Associate Professor.



- Supervisor will attend the defense as an observer and may interact only when requested by the evaluators.
- Thesis must be submitted to the controller of Exam not later than 27 months of enrolment in Phase-B.
- Thesis must be sent to the evaluators 2 (Two) weeks prior to assessment date.
- Evaluation will cover Thesis writing and its defense.
- For thesis writing evaluator will mark on its structure, content, flow, scientific value, cohesion, etc.
- For defense – Candidate is expected to defend, justify and relate the work and its findings.
- Assessment must be completed in next 3 months.
- Outcome of the assessment shall be in 4 categories – “Accepted”, “Accepted with minor correction”, “Accepted with major correction” and “Not Accepted”.

**8.3.1. Description of terms:**

- **Accepted:** Assessors will sign the document and resident will bound it and submit to the Controller of Examinations by 10 days of the examination.
- **Accepted with minor correction:** Minor correction shall include small inclusion/exclusion of section; identified missing references, correction of references and typographical and language problem. This should be corrected and submitted within 2 weeks.
- **Accepted with major correction:** Task is completed as per protocol with acceptable method but some re-analysis of result and corresponding discussion are to be modified.
- To be corrected, confirmed by Supervisor and submit within 3 (Three) weeks.

- **Not Accepted:** When work is not done as per protocol or method was faulty or require further inclusion or confirmation of study.
- To complete the suggested deficiencies and reappear in defense examination during its next Phase Final Examination.
- Candidate has to submit his/her thesis and sit for examination and pay usual examination fess for the examination.

**8.3.2.** Residents must submit and appear Thesis defense at notified date and time. However non- acceptance of the Thesis does not bar the resident in appearing the written, clinical and oral exam.

**8.4. Qualifying for MD/MS Degree:**

On passing both the compartments, the candidate will be conferred the degree of MD/MS in the respective discipline. If any candidate fails in one compartment he/she will appear in that compartment only in the subsequent Phase-B exam.

**9. Supervision and Training Monitoring:**

All elements of work in training posts must be supervised with the level of supervision varying depending on the experience of the trainee and the clinical exposure and case mix undertaken. Outpatient and referral supervision must routinely include the opportunity to personally discuss all cases if required. As training progresses the trainee should have the opportunity for increasing autonomy, consistent with safe and effective care for the patient. Supervisors have a responsibility to ensure that all trainees work under his supervision. This will allow a review of the progression of their knowledge, skills and

behaviors in particular professional conduct and their maintenance of patient safety will be of paramount importance. There must be sufficient time in the job plan of supervisors to provide this level of support to the trainees.

Department must ensure that trainees have access to on-line learning facilities and libraries.

Trainees will at all times have a named Supervisor responsible for overseeing their education.

**Supervisors** are responsible for supervision of learning throughout the program to ensure patient and / or laboratory safety, service delivery as well as the progress of the resident with leaning and performance. They set the lesson plans, based on the curriculum; undertake appraisal review progress against the curriculum give feedback on both formative and summative assessments as well as sign the logbook and portfolio. The residents are made aware of their limitations and encouraged to seek advice and receive help at all times. **The Course coordinator** of each department coordinates all training and academic activities of the program in collaboration with the **Course Manager**. **The Course Director** of each faculty directs, guide and manages curricular activities under his / her jurisdiction and is the person to be reported to for all events and performances of the residents and the supervisors.

#### **10. Curriculum Implementation, Review and Updating:**

Both Supervisors and Residents are expected to have a good knowledge of the curriculum and should use it as a guide for their training Program.

The curriculum is regarded as a living document, and the committee will ensure that it is able to respond swiftly to new developments.

The curriculum committee will consult widely within the Hepatologist community and will also involve trainees, lay representatives, and patients in the review process.

Residents and supervisors are encouraged to discuss the curriculum and to feedback on content and issue regarding implementation at Residency Course Director. Review will be time tabled to occur annually for any minor changes to the curriculum.

#### **11. Phase B Syllabus:**

In phase B Hepatology the followings are included in the syllabus:

##### **11.1. Common competencies**

##### **11.2. Hepatology**

##### **11.3. Gastroenterology**

##### **11.4. Pancreatic and biliary Disorders**

##### **11.5. Endoscopy**

##### **11.1. Common competencies**

History taking,

Clinical Examination

Safe Prescribing

Time Management and Decision Making

Decision Making and Clinical Reasoning

The Patient as Central Focus of Care

Prioritization of Patient Safety in Clinical Practice

Team Working

Infection Control

Relationships with Patients and Communication within a Carer

Breaking Bad News

Ethical Research

Audit

Teaching and training

**11.2. Hepatology****i) Basic Principles, Basic Anatomy and Physiology**

Understand the pathophysiology of liver disease and hepatocellular dysfunction.

Understand the micro-anatomy and physiology of the liver and relates these to disease process and cellular function.

**ii) Clinical Evaluation of Liver Disease**

Understand the range of symptoms and risk factors for liver disease and its investigation.

**iii) Complications of Cirrhosis, Portal Hypertension, Oesophageal Varices: Risk of Haemorrhage**

- Understand the risk of variceal bleeding as a complication of with portal hypertension. Acute variceal bleeding, primary and secondary prophylaxis.
- Define the causes (both hepatic and non hepatic) of ascites, and has a clear understanding of their pathogenesis and management.
- Know the differential diagnosis of different types of renal failure/impairment in liver disease.
- Understand the pathogenesis of hepatic encephalopathy (HE) and its management.
- The recognition of sepsis, its significance and prognosis in liver disease.

**iv) Specific Diseases**

- Understands acute hepatitis including viral, drug induced, alcohol-induced and auto-immune liver disease Know the appropriate plan of investigation and management of specific diseases including the role of serological investigations and liver biopsy.
- Assess and manage acute viral hepatitis

- Recognize the incidence of acute and chronic liver disease related to alcohol abuse and, in particular, the increasing alcohol consumption in adolescents, young adults, women in affluent society.
- Can Assess and manage Auto-Immune Liver Disease, Including Auto-Immune Hepatitis, PBC, PSC and Overlap Syndromes.
- Assess and manage Metabolic Liver Disease; Haemochromatosis and Wilson Disease, Fat-Related Liver Disease, Alpha-1-Antitrypsin Deficiency.
- Recognize drug induced liver injury (DILI), its severity and management Knowledge.
- Knows the indications for liver transplantation, appropriate timing of referral for assessment, and outcomes after transplantation.
- Understands the causes and pathophysiology of acute liver failure.

Can plan appropriate investigation, evaluate prognosis and construct a detailed management plan.

- To be able to assess patients with acute and chronic hepatitis C infection and determine suitability for treatment and further management
- Assess patients with acute and chronic hepatitis B infection and determine requirement for treatment and appropriate long term management.
- Assess and manage the cholestatic liver disease.
- Recognises and shows understanding of vascular liver disease including Budd-Chiari syndrome, veno-occlusive disease and portomesenteric venous thrombosis.
- To assess and manage the spectrum of liver diseases of pregnancy with respect to the stage of pregnancy and the timing of obstetric intervention.

**Residency Program**

**Hepatology**

- Knows the epidemiology, pathology, clinical presentation and natural history and management of benign tumours of the liver.
- Understands the epidemiology, risk factors, pathology, prevalence and management of HCC.
- Assessment and treatment of cholangiocarcinoma.

**11.3. Gastroenterology**

- Understands the development, structure and function of the normal gastrointestinal tract.
- Understand the range of symptoms arising from the upper GI tract and how patients with these are managed.
- Assessment and management of Upper Gastrointestinal Tract Disorders including: Gastro-Oesophageal Reflux, Dysphagia and Non Cardiac Chest Pain,
- Carcinoma of the Oesophagus, Dyspepsia and Peptic Ulcer, Upper Gastrointestinal Bleeding.
- Understand intestinal disorder; Diarrhoea, Irritable Bowel Syndrome. Functional Gut Disorders: Constipation and Disordered Defecation

Inflammatory and Infective Conditions, Large Intestinal Tumours,

Rectal Bleeding and Perianal Conditions, Inflammatory Bowel Disease, Malabsorption and Anaemia.

**11.4. Pancreatic and Biliary Disorders**

- Understand the physiology and the pathogenesis of gall bladder and pancreatic disease; gall stone, Acute Pancreatitis, Chronic Pancreatitis, Pancreatic Tumours.

**11.5. Endoscopy**

- Understand and can do quality endoscopic and colonoscopic procedure, unit management and ERCP.

**Residency Program**

**Hepatology**

**Annexure 1: Clinical Training Rotations:**

Block 1							
Months	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	
<b>Educational Program</b>	Anatomy, physiology of liver. Jaundice and Liver function test. History taking, clinical examination in relation to Hepatology. Acute Liver disease: acute viral hepatitis, DILD, acute liver failure. Basic Courses: Biostatistics, Research Methodology, Basics of Medical Education						E O B A
<b>Clinical Training Rotations</b>	Inpatient, outpatient, Emergency , Endoscopy						
<b>Thesis Work</b>	Protocol development/Submission/IRB clearance						

Block 2							
Months	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>	12 <sup>th</sup>	
<b>Educational Program</b>	Chronic hepatitis B and C. Pregnancy associated liver disease. Auto immune liver disease. Alcohol and liver. NAFLD and metabolic liver disease, liver biopsy						E O B A
<b>Clinical Training Rotations</b>	Inpatient, outpatient, Emergency , Endoscopy						
<b>Thesis Work</b>	Patient enrolment, Intervention and data collection						

Block 3							
Months	13 <sup>th</sup>	14 <sup>th</sup>	15 <sup>th</sup>	16 <sup>th</sup>	17 <sup>th</sup>	18 <sup>th</sup>	
<b>Educational Program</b>	Cirrhosis and complication of cirrhosis: Portal hypertension, Ascites, SBP, Hepato renal syndrome, Hepatic encephalopathy, infection. Benign and malignant liver tumors. Liver transplantation						E O B A
<b>Clinical Training Rotations</b>	Inpatient, outpatient, Emergency , Endoscopy						
<b>Thesis Work</b>	Patient enrolment, Intervention and data collection						

Block 4							
Months	19 <sup>th</sup>	20 <sup>th</sup>	21 <sup>st</sup>	22 <sup>nd</sup>	23 <sup>rd</sup>	24 <sup>th</sup>	
<b>Educational Program</b>	Biliary and pancreatic disorder. Hepatobiliary and pancreatic surgery. Vascular liver disease, cystic liver disease, liver abscess, Diagnostic and therapeutic endoscopy, ERCP, colonoscopy						E O B A
<b>Clinical Training Rotations</b>	Inpatient, outpatient, Emergency, Endoscopy, ERCP and Hepatobiliary Surgery.						
<b>Thesis Work</b>	Patient enrolment, Intervention, data collection and data analysis						

Block 5							
Months	25 <sup>th</sup>	26 <sup>th</sup>	27 <sup>th</sup>	28 <sup>th</sup>	29 <sup>th</sup>	30 <sup>th</sup>	
<b>Educational Program</b>	Upper GI Disorder: Bleeding, Peptic ulcer disease, dysphagia, malignancy, Intestinal disorder: diarrhea, malabsorption, IBS, constipation, Inflammatory bowel disorder colonic disorder, rectal bleeding.						E O B A
<b>Clinical Training Rotations</b>	Inpatient, outpatient, Emergency, Endoscopy						
<b>Thesis Work</b>	Report Writing and Submission						

Block 6						
Months	31 <sup>st</sup>	32 <sup>nd</sup>	33 <sup>rd</sup>	34 <sup>th</sup>	35 <sup>th</sup>	36 <sup>th</sup>
<b>Education Program</b>	Breaking bad news, communication skill, rational use of drugs and investigations, interpretation of lab data.		E O B A	Eligibility/Assessment and Phase B Final Examination		
<b>Clinical Training Rotations</b>	Inpatient, outpatient, Emergency, Endoscopy					
<b>Thesis Work</b>						

## Annexure 2:

## Syllabus for Paper I &amp; Paper II Phase B Written Examination

## PAPER I

## HEPATOLOGY

1. Clinical manifestations of liver disease
2. Jaundice
3. Cholestasis
4. Viral hepatitis
5. Fulminant hepatic failure
6. Sub acute hepatic failure
7. Chronic hepatitis
8. Cirrhosis
9. Ascites
10. Portal venous system & portal hypertension
11. Immunological mechanisms in chronic liver disease
12. Primary biliary cirrhosis
13. Hepatobiliary complications of Ulcerative colitis & Crohn's disease
14. Primary sclerosing cholangitis
15. Hepatic granuloma
16. Hepatocellular failure
17. Hepatic encephalopathy
18. Renal abnormalities in liver disease

## GASTROENTEROLOGY

19. Diseases of oral cavity & oesophagus
20. Diseases of stomach & duodenum
21. Diseases of small & large intestine
22. Diseases of pancreas
23. Disease of intra abdominal vasculature, supporting structure & peritoneum
24. Nutritional diseases of gastrointestinal tract

**PAPER II**

**HEPATOLOGY**

25. Toxic injury to liver
26. Clinical aspect of liver diseases caused by industrial & environmental toxins
27. Liver in surgery & anaesthesia
28. Alcoholic liver disease
29. Liver in infection
30. The liver in systemic condition
31. Effect of pregnancy & sex hormone on the liver
32. Copper metabolism, Wilson's disease & Hepatic copper toxicosis
33. Haemochromatosis: Iron metabolism & the iron overload syndrome
34. Inborn errors of metabolism leading to permanent liver injury
35. Alpha 1 antitrypsin deficiency
36. Liver in infancy & childhood
37. Disorders of hypothalamic-pituitary-gonadal & thyroid hormones in patients of liver disease
38. Cardiovascular & pulmonary complications of liver diseases
39. Liver in haematopoieses
40. Alteration of haemostasis in patients with liver disease
41. Cyst & congenital biliary abnormalities
42. Liver trauma
43. Hepatic tumours
44. Disease of biliary tree
45. Liver transplantation