With effect from the academic year 2009-2010

SCHEME OF INSTRUCTION & EXAMINATION
B.E. III/IV
(BIOMEDICAL ENGINEERING)

<table>
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<tr>
<th>S. NO</th>
<th>Syllabus Ref. No</th>
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<td>PERIODS PER WEEK</td>
<td>DURATION IN HOURS</td>
<td>MAXIMUM MARKS</td>
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<tr>
<td>1.</td>
<td>BM 351 UE</td>
<td>Basic Clinical Sciences Th-I (Nephrology, Neurology)</td>
<td>4 -  3</td>
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<td>2.</td>
<td>BM 352 UE</td>
<td>Basic Clinical Sciences Th-II (Gastroenterology, General Surgery)</td>
<td>4 -  3</td>
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<td>3.</td>
<td>BM 353 UE</td>
<td>Basic Clinical Sciences Th-III (Pathology and Blood Bank, Anaesthesia)</td>
<td>4 -  3</td>
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<td>4.</td>
<td>BM 354 UE</td>
<td>Basic Clinical Sciences Th-IV (Imaging Sciences, Radio therapy)</td>
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<td>5.</td>
<td>BM 355 UE</td>
<td>Basic Clinical Sciences Th-V (Cardiology, Orthopaedics)</td>
<td>4 -  3</td>
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PRACTICALS

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<tr>
<td>1.</td>
<td>BM 391 UE</td>
<td>Basic Clinical Sciences Pr-I (Nephrology, Neurology)</td>
<td>2 -</td>
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<td>2.</td>
<td>BM 392 UE</td>
<td>Basic Clinical Sciences Pr-II (Gastroenterology, General Surgery)</td>
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<td>3.</td>
<td>BM 393 UE</td>
<td>Basic Clinical Sciences Pr-III (Pathology and Blood Bank, Anaesthesia)</td>
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<td>Grade*</td>
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<td>4.</td>
<td>BM 394 UE</td>
<td>Basic Clinical Sciences Pr-IV (Imaging Sciences, Radio therapy)</td>
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<td>5.</td>
<td>BM 395 UE</td>
<td>Basic Clinical Sciences Pr-V (Cardiology, Orthopaedics)</td>
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<td>Grade*</td>
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TOTAL | 20 | 10 | 15 | 500 | 100 |

*. Grade: Excellent/Good/ satisfactory/ Unsatisfactory
BM 351 UE

BASIC CLINICAL SCIENCES THEORY-1

PART-1-NPHEROLOGY

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4


Renal transplantation. Basic Principles, Cadaver and donor types of transplantation. Tissue typing tests.


Suggested Reading

PART-II-NEUROLOGY

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4

Review of the structure and function of the nervous system. Central nervous system. Peripheral nervous system. Autonomic nervous system.


Suggested Reading:

1. Adams and Victor-Principles of Neurology
2. Brodal-Neuroanatomy
3. Lance and Mcleod-Physiological approach to clinical Neurology
**BM 352 UE**

**BASICAL CLINICAL SCIENCES THEORY-II**

**PART-I GASTROENTEROLOGY**

<table>
<thead>
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Anatomy and Physiology and G.I.T diseases: Stomach(ulcers), Liver(jaundice), Gall Bladder(gall stone), Disease diagnosis and treatment. Juices-Gastric, Bile, Pancreatic, Intestinal, including their functions and clinically significant symptoms-signs and diseases.

Digestion of Carbohydrates, Proteins and Fats. Nutritional support and parental nutrition. Height and weight estimations according to age.

Colonoscopy, Ryles’s tube, Laparoscopy, C.T scan & ultrasound of Abdomen, Liver Biopsy.

Endoscopy: Video endoscopy, fiber optic endoscopy, various endoscopic procedures, indications for E.R.C.P, therapeutic uses of endoscope in gastroenterology.

Intravenous cannulae. I.V. sets. Infusion pumps, stomach wash tubes, Nebulizers-types of humidifiers, sterilization of the equipment.

**Suggested Reading:**

1. Dent. Stodel, Turcoffe-*Surgical Endoscopy*
2. Bouchire, Allan-*Text Book of Gastroenterology*
BM 352 UE

PART-II-GENERAL SURGERY

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4


Suggested Reading:

1. Farguhersons, *Textbook of Operative Surgery*
2. Tean W. Salesh, *Laparoscopy*
3. Schwartz, *Principles of surgery*
BM 353 UE

BASIC CLINICAL SCIENCES THEORY-III

PART-I-PATHOLOGY & BLOOD BANK

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4


Suggested Reading:
BM 353 UE

PART-II-ANAESTHESIA

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4

General anaesthesia. The uptake of anaesthetic gases and vapours. Pre-anaesthetic care and preparation.
for prevention.

hypnosis. Electrical anaesthesia. Regional Spinal. Care and sterilization of equipment. Patient monitoring
during surgery. Monitoring of respiration and temperature. Invasive and non invasive monitoring-recent
trends. Organization of theaters.

Mechanism of respiration. Gas exchange. Hypoxia, Artificial respiration. Diagnostic and therapeutic
indications. Study of ventilators. Humidifiers. Constant pressure and constant volume types. Selection
Criteria. Premature baby incubators.

therapy and blood gas analysis.

measurements. Clinical significance.

Suggested Reading:

BM 354 UE

BASIC CLINICAL SCIENCES THEORY-IV

PART-I-IMAGING SCIENCES

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4


Suggested Reading:

1. Meredith and Massey, *Fundamental Principles of Radiology*
PART-II- RADIOTHERAPY

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4


Suggested Reading:

1. Meredith and Massay, *Fundamental Physics of Radiology*
2. Johns and Cunningham, *The physics of Radiology*
3. Ramesh Chandra, *Introduction to Nuclear Medicine*
BM 355 UE

BASIC CLINICAL SCIENCES THEORY-V

PART-I-CARDIOLOGY

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4


Suggested Reading:

1. Ruch Patton, Biophysics/Physiology in Volumes.
2. Glasser, Medical Physics
3. Cardiovascular Assist Devices
4. Rushmer, Cardiovascular Dynamics
5. Burton, Cardiovascular Physiology/Bio-Physics
PART-II-ORTHOPAEDICS

Instruction: 2 Periods per week
Duration of University Examination: 1 ½ Hours
University Examination: 50 Marks
Sessional: 10 Marks
Credits: 4


Suggested Reading:

3. Frankel and Nordin, lea and Basic Biomechanics of the Febiger: skeletal system.
BM 391 UE

BASIC CLINICAL SCIENCES PRACTICE-I

Instruction: 2 Periods per week
Examination: Grade: Excellent/Good/
Satisfactory/Unsatisfactory
Credits:

PART I-NEPHROLOGY

Demonstration /Practicals

1. Dialysers
2. Dialysate preparation
3. Haemodialysis machine.
4. Peritoneal dialysis
5. Water treatment Plant.

PART II-NEUROLOGY

Demonstration /Practicals

1. EMG recorder
2. EMG stimulators
3. EEG recorder
4. Special techniques in EEG
5. Cerebral angiography
6. Myelograph
BM 392 UE

BASIC CLINICAL SCIENCES PRACTICE-II

Instruction: 2 Periods per week
Examination: Grade: Excellent/Good/
             Satisfactory/Unsatisfactory

Credits:

PART I-GASTROENTEROLOGY

Demonstration/Practicals
Study and operation of:

1. Infusion pumps
2. IV sets
3. Endoscopic Instruments
4. Stomach wash tubes

PART II- GENERAL SURGERY

Demonstration/Practicals
Study and operation of:

1. Surgical equipment-Adult and paediatric
2. Suction apparatus
3. Cautery
4. Light Sources
5. Laparoscopic Instruments
BM 393 UE

BASIC CLINICAL SCIENCES PRACTICE-III

Instruction 2 Periods per week
Examination Grade: Excellent/Good/
Satisfactory/Unsatisfactory

Credits

PART I-PATHOLOGY & BLOOD BANK

Demonstration/Practicals
Study and operation of:

1. Blood gas analyzer
2. Auto analyzer
3. Cell counter
4. Blood tests
5. Metzler balance
6. Biopsy
7. Blood Storage
8. Electron Microscope
9. HIV tests

PART II-ANAESTHESIA

Demonstration/Practicals
Study and operation of:

1. Endotracheal tubes
2. Electro-surgical generators
3. Cold light sources
4. Servo Ventilators
5. Boyles apparatus
6. Spinal and epidural needles
7. Pulse oximeter
8. Ventilators
9. CSSD equipment
10. Cylinders for anaesthetic gases
BM 394 UE

BASIC CLINICAL SCIENCES PRACTICE-IV

Instruction: 2 Periods per week
Examination: Grade: Excellent/Good/
             Satisfactory/Unsatisfactory

Credits:

PART I - IMAGING SCIENCE

Demonstration/Practicals
Study and operation of:

1. X-Ray plant
2. X-Ray film developing technique
3. Ultrasound scanning
4. Echocardiograph
5. CAT
6. Spiral CT
7. MRI
8. DSA

PART II - RADIO THERAPY

Demonstration/Practicals
Study and operation of:

1. Co-60 Teletherapy unit
2. Linear accelerator
3. Gamma camera
4. Scintillation counters
5. Ionization chambers
BM 395 UE

BASIC CLINICAL SCIENCES PRACTICE-V

Instruction: 2 Periods per week
Examination: Grade: Excellent/Good/
Satisfactory/Unsatisfactory

Credits:

PART I-CARDIOLOGY

Demonstration/Practicals
Study and operation of:

1. ECG recorder and monitor
2. Holter monitor
3. Stress test
4. Pacemakers
5. Defibrillators
6. Heart lung machine
7. Hypothermia Unit
8. Oxygenators
9. Blood gas analyzers
10. Electrolyte analyzer etc.

PART II-ORTHOPAEDICS

Demonstration/Practicals
Study and operation of:

1. Orthotics
2. Splints
3. Prosthetic devices
4. Fracture fixation devices
5. Short wave diathermy
6. Microwave diathermy
7. Ultrasound diathermy