

# **MADHAV UNIVERSITY, PINDWARA**



## **ORDINANCE**

**(PARAMEDICAL SCIENCES)**



**“Madhav Hills” Opp. Banas Bridge Toll, NH-27,  
Village - Bharja-Wada, Tehsil - Pindwara,  
Dist - Sirohi (Rajasthan)**

**E-mail – [madhavuniversity@gmail.com](mailto:madhavuniversity@gmail.com) Website – [www.madhavuniversity.edu.in](http://www.madhavuniversity.edu.in)**

## **Ordinance-**

- Bachelor of Medical Lab Technology/**
- Bachelor of Operation Theater technology/**
- Bachelor of X-Ray technology/**
- Bachelor of Anesthesia technology/**
- Bachelor of Optometry/**
- Bachelor of Dialysis Technology/**
- Bachelor of Cardiac Care Technology**

### **1. ACADEMIC ELIGIBILITY**

- 1.1 Candidate should have passed class 10+2 Examinations (12<sup>th</sup> standard) or equivalent examination from any recognized board/University established by law in India with science stream i.e. Physics, Chemistry, Biology & English with 45% aggregate marks for general candidate and 40% marks for SC/ST candidate.
- 1.2 A candidate should have completed the minimum age of 17 years as on 31<sup>st</sup> December of the year of admission to BMLT/BOTT/BRIT/BAT/BOPT/BDT/BCCT degree courses. 5% age relaxation is for SC/ST Candidates.
- 1.3 Provision of Lateral Entry: Candidates who have passed diploma examination from Government Boards and recognized by State/Central University, fulfilling the conditions specified are eligible to take admission through lateral entry system in second year provided same subjects are studied at the diploma level.

### **2. ACADEMIC DURATION**

- 2.1 The duration of the Bachelor of Medical Lab Technology (BMLT)/ Bachelor of Operation Theater Technology (BOTT)/ Bachelor of Radio Imaging technology (BRIT) / Bachelor of Anesthesia technology (BAT)/ Bachelor of Optometry (BOPT)/ Bachelor of Dialysis



Technology BDT/ Bachelor of Dialysis Technology courses shall be for three and half years (6 semesters academic curriculum + (6) six months compulsory rotational internship).

2.2 The duration of each semester will generally be 90 working days or as prescribed by the University from time to time. There are two regular semesters in a year.

2.3 The semester that begins in July (July to November/December) is known as the Odd Semester and the semester that begins in December/January (December/January to May) is known as the Even Semester.

2.4 Change of Branch among the students having similar eligibility qualifications shall be allowed till the last date of lateral entry to semester III, provided the number of students in that branch should not go above the sanctioned intake.

### 3. COURSE OF STUDY

3.1 Rajasthan University of Health Sciences, Jaipur (RUHS) model course curriculum and syllabus will be followed with few modifications to meet out regional requirements of university/students.

3.2 Programme follows a specialized credit based semester system consisting of theory, practical, assignments, project work etc.

3.3. One credit is defined as one hour lecture /2 hours lab / 3 hours field work per week.

3.4. The medium of teaching and examination shall be English.

3.5 There shall be six months (24 weeks) of mandatory rotational internship in any multi specialty hospital recognized by Madhav University after successfully completing the final year examination.

**4. ATTENDANCE:** - Minimum 75% attendance for theory and practical subject separately, in each semester is compulsory for students to be permitted to appear in Semester examinations. However, the Dean Academic Affairs may consider to condone the shortage in attendance for up to 10% and the President, Madhav University may further consider to condone the shortage in attendance for up 5% under specific conditions for satisfactory reasons such as, participation in NCC/ NSS camps, participation in University/ Inter-university/ State-level games, participation in other extra-curricular activities at University/ Inter-university/ State level and prolonged illness and hospitalization.



## **5. FEE:-**

The amount of course and examination fee to be paid by a candidate for each semester/session shall be decided by the Fee Regulation Committee of university from time to time. The last date (s) by which examination forms and fees to be submitted shall be notified by the Controller of Examination from time to time.

## **6. Examination and Evaluation system**

6.1 The candidates shall be examined according to the syllabus as approved by the academic council from time to time.

6.2. The performance of candidates shall be evaluated by conducting examinations (written+ practical) which consist of 100 marks for each subject.

6.3. Courses with theory and practical will have Mid-term Exam (10 marks) + Practical exam (50 marks) + Theory exam (40 marks).

6.4. Courses with only theory will have Mid-term Exam (10 marks) + Final Theory (40 marks).

6.5 Syllabus of the concerned course shall be sent to the external examiner who shall prepare the question papers and the evaluation of answer sheets shall be done internally.

6.6. The practical examination will be conducted by concerned course instructor(s) and one teacher nominated by the Dean/HOD.

6.7. The candidate who fails to appear in any of the examination will be marked absent in the said examination.

6.8. A repeat of examination for absentee students, if any, will be held with next batch examination schedule in odd and even semester.

6.9. Grade points obtained only in 'credit courses' will be considered for the classification and declaration of results.

6.10. Examination of each theory paper shall be on marks basis and obtained marks will be converted to grade points as per the Table 6.1.





Table 6.1: Marks Obtained to Grade Point Conversion

Marks Obtained	Grade Earned
100%	10.000
95%	9.500
80%	8.000
75%	7.500
60%	6.000
Below 40% in Theory	F

#### 6.11. Internal Marks (Internal Assessment)

The internal assessment shall be based on factors such as participation in seminars, tests and oral presentations, submission of written assignments, class room participation and attendance. The weightage given to each of these factors for a paper shall be decided and announced at the beginning of the semester.

Internal assessment consists of two mid-term examinations. Pattern of midterm question paper shall be framed by board of studies of each department in consultation with Dean, Faculty of Physiotherapy and Paramedical Sciences.

#### 6.12. External Marks

The external assessment shall cover end term theory and practical examination as per the scheme.

### 7. Passing requirement

7.1. The minimum passing marks in a given semester/academic year will be 50%.

7.2. Candidates will be required to pass separately in all parts of written and practical examinations for each subject.

7.3. Students who maintain or fail to maintain the minimum passing marks at the end of semester/academic year, he/she will be promoted to the next semester/academic year, provided he/she obtains minimum 50% marks in 50% of the total courses offered in that particular semester/year.

7.4. Students shall be awarded degree, provided they maintain an aggregate of 50% marks at the end of their academic duration.

### 8. Classification of Division:



8.1. The Uniform Grading system has been followed with uniform SGPA and CGPA for award of degrees at all levels.

8.2. Credit based system:

***Illustration of Computation of SGPA and CGPA and Format for Transcripts***

*Illustration for computation of SGPA*

<i>Course</i>	<i>Credit</i>	<i>Grade letter</i>	<i>Grade point</i>	<i>Credit Point (Credit x Grade)</i>
<i>Course 1</i>	3	<i>A</i>	8	3x8=24
<i>Course 2</i>	4	<i>B+</i>	7	4x7=28
<i>Course 3</i>	3	<i>B</i>	6	3x6=18
<i>Course 4</i>	3	<i>O</i>	10	3x10=30
<i>Course 5</i>	3	<i>C</i>	5	3x5=15
<i>Course 6</i>	4	<i>B</i>	6	4x6=24
<i>Total</i>	20			139

Thus,  $SGPA = 139/20 = 6.95$

*Illustration for computation of CGPA*

<i>Semester 1</i>	<i>Semester 2</i>	<i>Semester 3</i>	<i>Semester 4</i>	<i>Semester 5</i>	<i>Semester 6</i>
<i>Credit:20</i>	<i>Credit:22</i>	<i>Credit:25</i>	<i>Credit:26</i>	<i>Credit:26</i>	<i>Credit:25</i>
<i>SGPA:6.9</i>	<i>SGPA:7.8</i>	<i>SGPA:5.6</i>	<i>SGPA:6.0</i>	<i>SGPA:6.3</i>	<i>SGPA:8.0</i>

Thus,  $CGPA = \frac{20 \times 6.9 + 22 \times 7.8 + 25 \times 5.6 + 26 \times 6.0 + 26 \times 6.3 + 25 \times 8.0}{144}$

= 6.73



8.3. To pass an examination a candidate has to obtain 50% marks in theory and practical separately in each subject. Candidate obtaining 75% and above in grand total in first attempt is declared to have passed these subjects with distinction. Candidate obtaining 60 % will be declared as first division. >60% will be declared second division.

8.4. Grace marks to the extent of 1% may be granted to students whose aggregate marks for award of degree fall short just by 1% than to enter in the next category.

8.4. In case of any mistake being detected during the preparation of the grade report OR brought to the notice afterwards, **THE UNIVERSITY IS FULLY EMPOWERED TO CORRECT THE SAME**

## **9. Fellowship**

9.1 All recommendations for the award of scholarships, fellowships and concessions shall be considered by the concerned committee of the university, on the basis of overall performance by the students in academic and extracurricular activities in the university. The decision of the committee shall be forwarded to the president for approval and implementation.





# MADHAV UNIVERSITY

Madhav Hills" Opp. Banas River Bridge Toll N.H.-27, P.O. - Bharja,  
Abu Road, Pindwara, Rajasthan 307026

**Scheme of Examination and Course of Study**

*OF*

**Under Graduate Degree Program**

**Syllabus (2017-18)**

**BACHELOR OF OPERATION THEATER TECHNOLOGY**

**(BOTT)**



**SCHEME OF EXAM****B.Sc.OTT****1<sup>ST</sup> SEMESTER**

<b>Subject code</b>	<b>Subjects</b>	<b>Theory</b>	<b>I.A Theory</b>	<b>Total Theory</b>	<b>Practical +Oral</b>	<b>I.A Practical</b>	<b>Total Practical</b>	<b>Grand Total</b>
<b>BOTT101</b>	Human Anatomy I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT102</b>	Human Physiology I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT103</b>	Biochemistry I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT104</b>	General Pathology I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT105</b>	General Microbiology I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT106</b>	Computer	<b>40</b>	<b>10</b>	<b>50</b>	-	-	-	<b>50</b>
<b>Total</b>								<b>550</b>

**2<sup>nd</sup> SEMESTER**

<b>Subject code</b>	<b>Subjects</b>	<b>Theory</b>	<b>I.A Theory</b>	<b>Total Theory</b>	<b>Practical +Oral</b>	<b>I.A Practical</b>	<b>Total Practical</b>	<b>Grand Total</b>
<b>BOTT201</b>	Human Anatomy II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT202</b>	Human Physiology II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT203</b>	Biochemistry II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT204</b>	General Pathology II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT205</b>	General Microbiology II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT206</b>	English	<b>40</b>	<b>10</b>	<b>50</b>	-	-	-	<b>50</b>
<b>Total</b>								<b>550</b>

### 3<sup>rd</sup> SEMESTER

Subject code	Subjects	Theory	I.A Theory	Total Theory	Practical +Oral	I.A Practical	Total Practical	Grand Total
<b>BOTT301</b>	Pharmacology I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT302</b>	Medicine relevant to Operation Theater Technology I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT303</b>	Introduction to Operation Theater Technology I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT304</b>	Applied Pathology I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT305</b>	Applied Microbiology I	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>Total</b>								<b>500</b>

### 4<sup>th</sup> SEMESTER

Subject code	Subjects	Theory	I.A Theory	Total Theory	Practical +Oral	I.A Practical	Total Practical	Grand Total
<b>BOTT401</b>	Pharmacology II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT402</b>	Medicine relevant to Operation Theater Technology II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT403</b>	Introduction to Operation Theater Technology II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT404</b>	Applied Pathology II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>BOTT405</b>	Applied Microbiology II	<b>40</b>	<b>10</b>	<b>50</b>	<b>40</b>	<b>10</b>	<b>50</b>	<b>100</b>
<b>Total</b>								<b>500</b>

### 5<sup>TH</sup> SEMESTER

Subject code	Subjects	Theory	I.A Theory	Total Theory	Practical +Oral	I.A Practical	Total Practical	Grand Total
BOTT501	Operation Theater Technology Clinical I	40	10	50	40	10	50	100
BOTT502	Operation Theater Technology Applied I	40	10	50	40	10	50	100
BOTT503	Operation Theater Technology Advance I	40	10	50	40	10	50	100
BOTT504	Bio Statistics and Research Methodology I	40	10	50	-	-	-	50
BOTT505	Health Care and Ethics I	40	10	50	-	-	-	50
<b>Total</b>								<b>400</b>

### 6<sup>TH</sup> SEMESTER

Subject code	Subjects	Theory	I.A Theory	Total Theory	Practical +Oral	I.A Practical	Total Practical	Grand Total
BOTT601	Operation Theater Technology Clinical II	40	10	50	40	10	50	100
BOTT602	Operation Theater Technology Applied II	40	10	50	40	10	50	100
BOTT603	Operation Theater Technology Advance II	40	10	50	40	10	50	100
BOTT604	Bio Statistics and Research Methodology II	40	10	50	-	-	-	50
BOTT605	Health Care and Ethics II	40	10	50	-	-	-	50
<b>Total</b>								<b>400</b>

# SYLLABUS

## 1<sup>ST</sup> SEMESTER Paper-I (BOTT-101) Anatomy

### 1. Introduction: Human body as a whole

Definition of anatomy and its divisions.

Terms of location, positions and planes.

Cell and its organelles.

Epithelium: definition, classification, describe with examples, function.

Glands: classification, describe serous & mucous glands with examples.

Basic tissues: classification with examples

### 2. Locomotion and support

Cartilage: types with example & histology.

Bone: classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, inter-vertebral disc, fontanelles of fetal skull.

Joints: classification of joints with examples, synovial joint (in detail for radiology).

Muscular system: classification of muscular tissue & histology, names of muscles of the body.

### 3. Peritoneum-Description in brief.

### 4. Sensory organs:

Skin: histology, appendages of skin.

Eye: parts of eye & lacrimal apparatus. Extra-ocular muscles & nerve supply.

Parts of ear: external, middle and inner ear and contents.

### 5. Reproductive system

Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology).

Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology). Mammary gland: gross.

### 6. Endocrine glands

Endocrine glands: pituitary gland, thyroid gland, parathyroid gland, suprarenal gland (gross & histology).

### Practical:

Histology of types of epithelium.

Histology of serous, mucous & mixed salivary gland.

Histology of the 3 types of cartilage.

Demo of all bones showing parts, radiographs of normal bones & joints.

Histology of compact bone (TS & LS).

Demonstration of all muscles of the body.

Histology of skeletal, smooth & cardiac muscle (TS & LS).

Demonstration of the glands.

Histology of pituitary, thyroid, parathyroid, suprarenal glands.

Histology of thin and thick skin.

Demonstration and histology of eyeball.

Histology of cornea & retina

Demonstration of models.

Demonstration of section of male and female pelvis with organs in situ.

Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tube, ovary.

Radiographs of pelvis, hystero-salpingogram.

**Paper-II BOTT 102**  
**PHYSIOLOGY**

### **1. Blood**

Introduction: composition and function of blood.

Red blood cells: erythropoiesis, stages of differentiation, function, count, physiological variation.

Structure, function, concentration, physiological variation, methods of estimation of haemoglobin. White blood cells: production, function, life span, count, differential count. Platelets: origin, normal count, morphology functions. Plasma proteins: production, concentration, types, functions, albumin, globulin, fibrinogen, prothrombin.

Haemostasis: definition, normal haemostasis, clotting factors, mechanism of clotting, disorders of clotting factors.

Blood bank:

Blood groups: ABO system, Rh system.

Blood grouping & typing, cross matching.

Rh system: Rh factor, Rh incompatibility.

Blood transfusion: indication, universal donor and recipient concept.

Selection criteria of a blood donor, transfusion reactions.

Anticoagulants: classification, examples and uses.

Anaemias: morphological and etiological classification, effects of anemia on body.

Blood indices: colour index, MCH, MCV, MCHC.

Erythrocyte sedimentation rate (ESR) and packed cell volume, normal values, definition, determination.

Blood volume: normal value, determination of blood volume and regulation of blood Bvolume.

Body fluid: pH, normal value, regulation and variation.

Lymph: lymphoid tissue formation, circulation, composition and function of lymph.

### **2. Endocrine System**

Definition, classification of endocrine glands & their hormones, properties of hormones.

Thyroid gland hormone: physiological anatomy, hormone secreted, physiological function, regulation of secretion, disorders: hypo and hyper secretion of hormone.

Adrenal cortex: physiological anatomy of adrenal gland, adrenal cortex, cortical hormones, functions and regulation.

Adrenal medulla: hormones, regulation and secretion. Functions of adrenaline and nor adrenaline.

Pituitary hormones: anterior and posterior pituitary hormones, secretion, function. Hormones of pancreas.

Insulin: secretion, regulation, function and action.

Diabetes mellitus: regulation of blood glucose level.

Parathyroid gland: function, action, regulation of secretion of parathyroid hormone.

Calcitonin: function and action.

### **3. Special senses**

Vision: structure of eye, function of different parts. Structure of retina.

Hearing: structure and function of ear, mechanism of hearing.

Taste buds: functions.

Smell: physiology, receptors.

### **4. Excretory System**

Functions of kidneys, nephron, vasa recta, cortical and juxtamedullary nephrons, comparison, juxta glomerular apparatus: structure and function. Renal circulation peculiarities.

Mechanism of urine formation: ultrafiltration criteria for filtration GFR, plasma fraction, GFR, factors effecting GFR. Determination of GFR selective reabsorption –sites of reabsorption, substance reabsorbed, mechanisms of reabsorption of glucose, urea, H<sup>+</sup>, Cl<sup>-</sup> aminoacids etc. TMG, tubular load, renal threshold % of reabsorption of different substances, selective secretion.

Properties and composition of normal urine, urine output. Abnormal constituents in urine, mechanism of urine concentration. Counter-current mechanisms : micturition, innervations of bladder, cystourethrogram.

Diuretics: water, diuretics, osmotic diuretics, artificial kidney, renal function tests: plasma clearance, actions of ADH, aldosterone and PTH on kidneys. Renal function tests.



## **5. Muscle nerve physiology**

Classification of muscle, structure of skeletal muscle, sarcomere contractile proteins, Neuromuscular junction. Transmission across neuromuscular junction. Excitation contraction coupling. Mechanism of muscle contraction muscle tone, fatigue, rigor mortis.

## **6.Skin**

Structure and function, body temperature measurement, physiological variation, regulation of body temperature by physical chemical and nervous mechanisms. Role of hypothalamus, hypothermia and fever.

## **Practical's**

Haemoglobinometry.

White blood cell count.

Red blood cell count.

Determination of blood groups.

## **REFERENCE BOOKS**

1. Guyton (Arthur): Text Book of Physiology.Latest Ed. Prism publishers.
2. Chatterjee CC: Human Physiology Latest Ed.Vol-1, Medical Allied Agency.
3. Choudhari Sujith K: Concise Medical Physiology Latest Ed. New Central Book.
4. Ganong William F: Review of Medical Physiology. Latest Ed. Tata McGraw Hill.

## **Paper-III**

### **BIOCHEMISTRY (BOTT 103)**

#### **1. Specimen collection:**

Pre-analytical variables.

Collection of blood.

Collection of CSF & other fluids.

Urine collection.

Use of preservatives.

Anticoagulants.

#### **2. Acids and bases:**

Definition, pH, Henderson – Hasselbalch equation, Buffers, Indicators, Normality, Molarity, Molality

**3. Water and electrolytes-** Fluid compartment, daily intake and output dehydration hydration sodium potassium chloride metabolism

**4. Carbohydrates** -Glucose and Glycogen Metabolism

**5. Proteins:-**Classification of proteins and functions

## **PRACTICALS**

Benedict's test

Heat coagulation tests

Analysis of normal urine.

Composition of urine.

Procedure for routine screening.

Urinary screening for inborn errors of metabolism.

Common renal disease.

Urinary calculus.

Urine examination for detection of abnormal constituents.

Interpretation and diagnosis through charts.

## **REFERENCE BOOKS**

1. Varley: Clinical chemistry
2. Teitz: Clinical chemistry
3. Kaplan: Clinical chemistry

4. Ramakrishna S, Prasanna KG, Rajna: Text book of Medical Biochemistry. Latest Ed. Orient longman Bombay –1980
5. Vasudevan DM, Sreekumari,S: Text book of Biochemistry for Medical students, Latest Ed
6. Das, Debajyothi): Biochemistry, Latest ED, Academic, Publishers, Calcutta – 1992
7. Rajagopal G & Ramakrishna, 1983: Practical Biochemistry for Medical Students Oriental Blackswan Pvt. Ltd.
8. Rajagopal: Practical Biochemistry for Medical students-, Orient Longman PVT Ltd.

**Paper-IV**  
**PATHOLOGY(BOTT 104)**

**1. Histopathology**

Introduction to histopathology.  
 Receiving of specimen in the laboratory.  
 Grossing techniques.  
 Mounting techniques: various mountants.  
 Maintenance of records and filing of the slides.  
 Use & care of microscope.  
 Various fixatives, mode of action, preparation and indication.  
 Section cutting.  
 Tissue processing for routine paraffin sections.  
 Decalcification of tissues.  
 Staining of tissues: H & E Staining.  
 Bio-medical waste management.

**2. Clinical Pathology**

Introduction to clinical pathology.  
 Collection, transport, preservation, and processing of various clinical specimens.  
 Urine Examination: collection and preservation of urine, physical, chemical, microscopic examination.  
 Examination of body fluids.  
 Examination of cerebro spinal fluid (CSF).  
 Sputum examination.  
 Examination of faeces.

**PRACTICALS**

Urine Examination: physical, chemical, microscopic.  
 Histopathology: section cutting and H &E staining.

**REFERENCE BOOKS**

1. Culling: Histopathology techniques
2. Bancroft: Histopathology techniques
3. Koss: Cytology
4. Winifred Greg: Diagnostic Cytopathology
5. Orell: Cyto Pathology
6. Todd & Sanford: Clinical Diagnosis by laboratory method
7. Dacie & Lewis: Practical Haematology
8. Ramanic Sood: Laboratory Technology (Methods and interpretation) 4th Ed. J.P. Bros, New Delhi -1996.
9. Satish Gupta: Short text book of Medical Laboratory for technicians J.P. Bros, New Delhi - 1998.
10. Sachdev K.N.: Clinical Pathology and Bacteriology 8th Ed, J.P. Bros, New Delhi-1991.
11. Krishna: Text book of Pathology, Orient Longman PVT Ltd.New Delhi-1991.

**Paper-V**  
**MICROBIOLOGY (BOTT 105)**

**1. Morphology**

Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.

**2. Growth and nutrition**

Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.

**3. Culture media**

Use of culture media in diagnostic bacteriology, anti microbial sensitivity test.

**4. Sterilization and Disinfection**

Principles and use of equipments of sterilization namely hot air oven, autoclave and serum inspissator, pasteurization, antiseptic and disinfectants.

**5. Immunology**

Immunity, vaccines, types of vaccine and immunization schedule, principles and interpretation of common serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HBsAg (excluding technical details).

**Practical**

Compound microscope.

Demonstration of sterilization equipments: hot air oven, autoclave, bacterial filters.

Demonstration of commonly used culture media, nutrient broth, nutrient agar, blood agar, chocolate agar, Mac conkey medium, L J media, Robertson cooked meat media, Potassium tellurite media with growth, Mac with LF & NLF, NA with staph.

Antibiotic susceptibility test.

**REFERENCE BOOKS**

1. Anathanarayana & Panikar: Medical Microbiology – Revised 8th Edition University Press.
2. Robert Cruickshank: Medical Microbiology – The Practice of Medical Microbiology.
3. Chatterjee: Parasitology – Interpretation to Clinical medicine.
4. Rippon: Medical Mycology.
5. Emmons: Medical Mycology.
6. Basic Laboratory methods in Parasitology: 1st Ed, J P Bros, New Delhi.
7. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers, New Delhi.
8. Ajit Damle: Medical Parasitology.
9. Anathanarayana: Introduction to Medical Microbiology, Orient Longman PVT Ltd.

**PAPER VI**  
**Computer (BOTT 106)**

**Computer Application:**

Characteristic of Computers, Input, Output, Storage Units, CPU, Computers System.

**Computers Organization:**

Central Processing Unit, Control Unit, Arithmetic Unit, Instruction Set, Register, Processor Speed.

**Memory:**

Main Memory, Storage Evaluation Criteria, Memory Organization, Memory Capacity, Random Access Memories, Read Only Memory, Secondary Storage Devices, Magnetic Disk, Floppy and Hard Disk, Optical Disks CD-ROM, Mass Storages Devices.

**Input Devices:**

Keyboard, Mouse, Trackball, Joystick, Scanner, Optical Mark Reader, Bar-code reader, Magnetic ink character reader, Digitizer, Card reader, Voice recognition, Web cam, Video Cameras.

**Output Devices:**

Monitors, Printers, Dot Matrix Printers, Inkjet Printers, Laser Printers, Plotters, Computers Output Micro Files

(Com), Multimedia Projector.

**Operating System:**

Microsoft Windows, An overview of different versions of Windows, Basic Windows elements, File managements through Windows.

Using Essential Accessories-

System tools, Disk cleanup, Disk defragmenter, Entertainments, Games, Calculator, Imagine-Fax, Notepad, paint, Word Pad, Recycle bin, windows Explorer, Creating folders icons.

**Word Processing:**

Word processing concepts, Saving, Closing and opening existing documents, Selecting text, Editing text, Finding and replacing text, Printing documents, Creating and printing merged documents, Mail merge, Character and paragraph formatting, Page designs and layout, Editing and proofing tools checking and correcting spellings, Handling graphics, Creating tables and charts, Documents templates and wizards.

**Presentation Package:**

Creating opening and saving presentations, Creating the look of your presentation, Working in different views working with slides, Adding and formatting text, Formatting paragraphs, Checking spelling and correcting typing mistakes, Making notes pages and handouts, Drawing and working with objectives, Adding clip art and other pictures, Designing slides shows, Running and controlling a slid show, Printing Presentations.

**E-Mail and Internet:**

Use of Internet and Email, Internet, Websites (Internet Sites), The Mail protocol suit.

**SECOND SEMESTER (BOTT 201)**

**Paper-I**

**Human Anatomy I**

**1. Cardiovascular system**

Heart: size, location, chambers, exterior & interior, blood supply of heart. Systemic & pulmonary circulation, branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery, peripheral pulse, inferior vena cava, portal vein, porto-systemic anastomosis, great saphenous vein, dural venous sinuses.

Lymphatic system: cisterna chyli & thoracic duct, histology of lymphatic tissues, names of regional lymphatics, axillary and inguinal lymph nodes in brief.

**2. Gastro-intestinal system**

Parts of GIT, oral cavity, lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands, Waldeyer's ring, oesophagus, stomach, small and large intestine, liver, gall Mbladder, pancreas, radiographs of abdomen.

**3. Respiratory system**

Parts of RS, nose, nasal cavity, larynx, trachea, lungs, broncho-pulmonary segments, histology of trachea, lung and pleura, names of paranasal air sinuses.

**4. Urinary system**

Kidney, ureter, urinary bladder, male and female urethra. Histology of kidney, ureter and urinary bladder.

**5. Nervous system**

Neuron, classification of nervous system, cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (gross & histology), meninges, ventricles & cerebrospinal fluid, names of basal nuclei, blood supply of brain, cranial nerves. Sympathetic trunk & names of parasympathetic ganglia.

**6. Embryology:**

Spermatogenesis & oogenesis.

Ovulation, fertilization.

Fetal circulation.

Placenta.

**Practical's**

Demonstration of heart and vessels in the body.  
Histology of large artery, medium sized artery & vein, large vein.  
Histology of lymph node, spleen, tonsil & thymus.  
Normal chest radiograph showing heart shadows.  
Normal angiograms.  
Demonstration of parts of gastro intestinal system.  
Normal radiographs of gastro intestinal system.  
Histology of gastro intestinal system.  
Demonstration of parts of respiratory system.  
Normal radiographs of chest.  
Histology of lung and trachea.  
Demonstration of parts of urinary system.  
Histology of kidney, ureter, urinary bladder.  
Radiographs of abdomen-IVP, retrograde cystogram.  
Histology of peripheral nerve & optic nerve.  
Demonstration of all plexuses and nerves in the body.  
Demonstration of all parts of brain.  
Histology of cerebrum, cerebellum, spinal cord

## **PAPER II (BOTT 202)** **Physiology II**

### **1. Cardiovascular system**

Heart: physiological anatomy, nerve supply.  
Properties of cardiac muscle, cardiac cycle: systole, diastole. Intra-ventricular pressure curves. Cardiac output (only definition).  
Heart sounds, normal heart sounds, areas of auscultation.  
Blood pressure: definition, normal value, clinical measurement of blood pressure.  
Physiological variations, regulation of heart rate, cardiac shock, hypotension, hypertension.  
Pulse: jugular, radial pulse, triple response.  
Heart sounds: normal heart sounds, causes, characteristics and significance, heart rate.  
Electrocardiogram (ECG) significance.

### **2. Respiratory system**

Functions of respiratory system, physiological anatomy of respiratory system, respiratory tract, respiratory muscles.  
Respiratory organs: lungs, alveoli, respiratory membrane, stages of respiration.  
Mechanism of normal and rigorous respiration, forces opposing and favoring expansion of the lungs. Intra pulmonary pleural pressure, surface tension, recoil tendency of the wall.  
Transportation of respiratory gases: transportation of oxygen: direction, pressure gradient, forms of transportation, oxygenation of Hb. Quantity of oxygen transported. Lung volumes and capacities  
Regulation of respiration: mechanisms of regulation, nervous and chemical regulation, respiratory centre, Herring Breur reflexes.  
Applied physiology and respiration: hypoxia, cyanosis, asphyxia, dyspnea, dysbarism, artificial respiration, apnoea.

### **3. Nervous system**

Functions of nervous system, neuron: structure, classification and properties.  
Neuroglia, nerve fiber, classification, conduction of impulses continuous and saltatory.  
Velocity of impulse transmission and factors affecting.  
Synapse: structure, types, properties.  
Receptors: definition, classification, properties.  
Reflex action: unconditioned properties of reflex action. Babinski's sign.  
Spinal cord nerve tracts. Ascending tracts, descending tracts.

#### **• Pyramidal tracts**



Extrapyramidal tracts, functions of medulla, pons, hypothalamic disorders. Cerebral cortex lobes and functions, sensory cortex, motor cortex, cerebellum, functions of cerebellum. Basal ganglion: functions. EEG. Cerebro Spinal Fluid(CSF) : formation, circulation, properties, composition and functions. Lumbar puncture.

• **Autonomic Nervous System:**

Sympathetic and parasympathetic distribution and functions and comparison of functions.

#### **4. Excretory System**

Functions of kidneys, nephron, vasa recta, cortical and juxtamedullary nephrons, comparison, juxta glomerular apparatus: structure and function. Renal circulation peculiarities.

Mechanism of urine formation: ultrafiltration criteria for filtration GFR, plasma fraction, GFR, factors effecting GFR. Determination of GFR selective reabsorption –sites of reabsorption, substance reabsorbed, mechanisms of reabsorption of glucose, urea, H<sup>+</sup>, Cl<sup>-</sup> aminoacids etc. TMG, tubular load, renal threshold % of reabsorption of different substances, selective secretion.

Properties and composition of normal urine, urine output. Abnormal constituents in urine, mechanism of urine concentration. Counter-current mechanisms : micturition, innervations of bladder, cystourethrogram.

Diuretics: water, diuretics, osmotic diuretics, artificial kidney, renal function tests: plasma clearance, actions of ADH, aldosterone and PTH on kidneys. Renal function tests.

#### **5. Reproductive system**

Function of reproductive system, puberty.

Male reproductive system: functions of testes, spermatogenesis: site, stages, factors influencing, semen. Endocrine functions of testes.

Androgens: testosterone structure and functions.

Female reproductive system: ovulation, menstrual cycle: physiological changes during pregnancy, pregnancy test.

Lactation: composition of milk, factors controlling lactation.

Practical's

Leishman's staining and differential WBC count.

Determination of packed cell Volume.

Erythrocyte sedimentation rate (ESR).

Calculation of blood indices.

Determination of clotting time, bleeding time.

Blood pressure recording.

Auscultation for heart sounds.

Artificial respiration.

Determination of vital capacity.

#### **REFERENCE BOOKS**

1. Guyton (Arthur): Text Book of Physiology.Latest Ed. Prism publishers.
2. Chatterjee CC: Human Physiology Latest Ed.Vol-1, Medical Allied Agency.
3. Choudhari Sujith K: Concise Medical Physiology Latest Ed. New Central Book.
4. Ganong William F: Review of Medical Physiology. Latest Ed. Tata McGraw Hill.

#### **Paper-III (BOTT 203) BIOCHEMISTRY**

**1. Lipids:-** Classification of lipids and functions

**2. Enzymes:-**Definition – Nomenclature – Classification – Factors affecting enzyme activity – Active site – Coenzyme – Enzyme Inhibition – Units of enzyme – Isoenzymes – Enzyme pattern in diseases.

**3. Vitamins & Minerals:**

Fat soluble vitamins(A,D,E,K) – Water soluble vitamins – B-complex vitamins- principal elements(Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and sulphur)- Trace elements – Calorific value of foods – Basal metabolic rate(BMR) – respiratory quotient(RQ) Specific dynamic action(SDA) – Balanced diet – Marasmus – Kwashiorkor

#### 4. **Hormones-** General characteristic and classification, mechanism of hormone action

##### Practical's

Urinary screening for inborn errors of metabolism.

Common renal disease.

Urinary calculus.

Urine examination for detection of abnormal constituents.

Interpretation and diagnosis through charts.

Liver function tests.

Lipid profile.

Renal function test.

Cardiac markers.

Blood gas and electrolytes.

Titration of a simple acid and a base (preparation of standard solution of oxalic acid and using this solution finding out the normality of a sodium hydroxide solution. Acid to be titrated using this base Calculation of normality of an acid or a base after titration, measurement of hydrogen ion concentration.

##### **REFERENCE BOOKS**

1. Varley: Clinical chemistry
2. Teitz: Clinical chemistry
3. Kaplan: Clinical chemistry
4. Ramakrishna S, Prasanna KG, Rajna: Text book of Medical Biochemistry. Latest Ed. Orient longman Bombay –1980
5. Vasudevan DM, Sreekumari,S: Text book of Biochemistry for Medical students, Latest Ed
6. Das, Debajyothi): Biochemistry, Latest ED, Academic, Publishers, Calcutta – 1992
7. Rajagopal G & Ramakrishna, 1983: Practical Biochemistry for Medical Students Oriental Blackswan Pvt. Ltd.
8. Rajagopal: Practical Biochemistry for Medical students-, Orient Longman PVT Ltd.

#### **Paper-IV (BOTT 204)** **PATHOLOGY**

##### **Clinical Pathology**

Introduction to clinical pathology.

Collection, transport, preservation, and processing of various clinical specimens.

Urine Examination: collection and preservation of urine, physical, chemical, microscopic examination.

Examination of body fluids.

Examination of cerebro spinal fluid (CSF).

Sputum examination.

Examination of faeces.

##### **Blood Bank**

Introduction.

Blood grouping and Rh types.

Cross matching.

##### **Practical's**

Histopathology: section cutting and H &E staining.

##### **REFERENCE BOOKS**

1. Culling: Histopathology techniques
2. Bancroft: Histopathology techniques
3. Koss: Cytology

4. Winifred Greg: Diagnostic Cytopathology
5. Orell: Cyto Pathology
6. Todd & Sanford: Clinical Diagnosis by laboratory method
7. Dacie & Lewis: Practical Haematology
8. Ramanic Sood: Laboratory Technology (Methods and interpretation) 4th Ed. J.P. Bros, New Delhi -1996.
9. Satish Gupta: Short text book of Medical Laboratory for technicians J.P. Bros, New Delhi - 1998.
10. Sachdev K.N.: Clinical Pathology and Bacteriology 8th Ed, J.P. Bros, New Delhi-1991.
11. Krishna: Text book of Pathology, Orient Longman PVT Ltd.New Delhi-1991.

**Paper-V**  
**MICROBIOLOGY (BOTT 205)**

**1. Systematic Bacteriology**

Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (excluding classification, antigenic structure and pathogenicity), Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Esch coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochetes.

**2. Parasitology**

Morphology, life cycle, laboratory diagnosis of following parasites: E. histolytica, Plasmodium, tape worms, Intestinal nematodes.

**3. Mycology**

Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi

**4. Virology**

General properties of viruses, diseases caused lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

**5. Hospital infection**

Causative agents, transmission methods, investigation, prevention and control of hospital infection.

**6. Principles and practice Biomedical waste management**

**Practical's**

Grams staining.

Acid fast staining.

Stool exam for helminthic ova & cysts.

Visit to hospital for demonstration of biomedical waste management.

Anaerobic culture methods.

**REFERENCE BOOKS**

1. Anathanarayana & Panikar: Medical Microbiology – Revised 8th Edition University Press.
2. Robert Cruickshank: Medical Microbiology – The Practice of Medical Microbiology.
3. Chatterjee: Parasitology – Interpretation to Clinical medicine.
4. Rippon: Medical Mycology.
5. Emmons: Medical Mycology.
6. Basic Laboratory methods in Parasitology: 1st Ed, J P Bros, New Delhi.
7. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers, New Delhi.
8. Ajit Damle: Medical Parasitology.
9. Anathanarayana: Introduction to Medical Microbiology, Orient Longman PVT Ltd.

**Paper -VI (BOTT 206)**  
**English**

**Parts of Speech:** Definition of all the eight parts along with examples and their use in language.

**Definite and Indefinite articles:** a, an, and, the, Definition and its uses along with examples.

**Types of Pronouns:** Personal, Reflexive, Emphatic, Demonstrative, Relative, Indefinite, Interrogative and Distributive pronouns.

**Noun:** Defining noun along with types and categories, Gender, Number case Adjective:

**Adjective,** Comparison, Adjective used as nouns, Positions of the Adjective and Correct use of Adjectives.

**Verb:** Definition, Its forms, Verbs of incomplete predication, Phrases (defining it along with examples). Adjective, Adverb and Noun Phrase.

**Clauses:** Defining it along with examples: Adverb, Adjective and Noun Clauses.

**Sentence and its Types:** Simple, Compound and Complex, Subject and Predicate (parts of a sentence), Transformation of Sentences.

Active and Passive voice, Mood and Narration (Direct and Indirect speeches).

**Words and Phrases:** Word formation (prefix, suffix), Idioms, Synonyms and Antonyms, Phonetics, Speech sound, The phoneme, The syllable and IPA transcription.

**Business Correspondence I:** Paragraph writing, Introductory remarks, Principles, Writing of single paragraphs and precise writing

Letter writing Quotations and Orders-

Orders and tenders, Inviting and sending quotations, Placing orders and Inviting tenders.

**Business Correspondence II:** Notices, Agenda and Minutes, Application letter, Importance and function, Drafting the application, Elements structure, Preparing CV's.

**Applied Grammar:** Correct usage of Grammar, Structure of sentences, Structure of paragraphs, Enlargements of vocabulary.

**Business Writing:** Written composition, Precise writing and summarizing, Writing of Bibliography, and Enlargement of vocabulary.

**Reference Books**

1. Selva Rose. 1997, Career English for Nurses. Published by: Orient Blackswan Ltd
2. Oxford advanced Learners Dictionary, 1996
3. Quirk Randolph and Greenbaum Sidney, 1987. A University Grammar of English, Hong Kong: Longman group (FE) Ltd/ Pearson.
4. Thomson A.J. and Maituiet A.V. 1987, A Practical English Grammar, Delhi: Oxford University Press.
5. Gimson A.C. 1989, An Introduction to pronunciation of English. Hodder Arnold; 4<sup>th</sup> Revised edition (1 May 1989).
6. O'Connor J.D, 1986. Better English pronunciation. Cambridge: University Press
7. By water F.V.A. 1982, Proficiency Course in English. London: 1-lodder and Stronglton.
8. Roget S.P. 1960, Thesaurus of English Words & Phrases, London: Lowe & Brydone Ltd. 1960.

**Third Semester**  
**Paper-I (BOTT 301)**  
**Pharmacology I**

**1. Anaesthetic agents.**

- a) Definition of general and local anaesthetics.
- b) Classification of general anaesthetics.
- c) Pharmacokinetics and pharmacodynamics of inhaled anaesthetic agents.
- d) Intravenous general anaesthetic agents.
- e) Local anaesthetics: classification, mechanism of action, duration of action and methods to prolong the duration of action, preparation, dose and routes of administration.

**2. Analgesics**

- a) Definition and classification.
- b) Routes of administration, dose, frequency of administration, side effects and management of non opioid and opioid analgesics.

**3. Antihistamines and antiemetics**

Classification, mechanism of action, adverse effects, preparations, dose and routes and administration.

**4. CNS stimulants**

**5. Corticosteroids**

Classification, mechanism of action, adverse effects and complications, preparation, dose and routes of administration.

**6. Diuretics**

- a) Renal physiology.
- b) Site of action of diuretics.
- c) Adverse effects.
- d) Preparations, dose and routes of administration.

**7. Chemotherapy of infections**

- a) Definition.
- b) Classification and mechanism of action of antimicrobial agents.
- c) Combination of antimicrobial agents.
- d) Chemoprophylaxis.
- e) Classification, spectrum of activity, dose, routes of administration and adverse effects of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, antitubercular drugs.

**RECOMMENDED BOOKS.**

1. R.S. Satoskar, S.D. Bhandarkar, S.S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, single Volume, M/S Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay - 400 034.
2. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post Box, 7193, G-16, EMCA House, 23/23, Bansari Road, Daryaganj, New Delhi.
2. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.



**PAPER II (BOTT 302)**  
**Medicine Relevant to Operation Theatre Technology I**

1. Diabetes mellitus.
2. Hypertension.
3. Ischemic heart disease.
4. Obesity.
5. Elderly patient.
6. Pregnancy.
7. Shock.

**PAPER III (BOTT 303)**  
**Introduction to Operation Theatre Technology I**

1. CSSD and logistics:
  - a) Cleaning and dusting: methods of cleaning, composition of dust.
  - b) General care and testing of instruments: forceps, haemostatic, needle holders, knife, blade, scissor, use/ abuse, care during surgery.
  - c) Disinfectants of instruments and sterilization- definition, methods, cleaning agents, detergents, mechanical washing, ultrasonic cleaner, lubrication, inspection and pitfalls
  - d) Thermal, hot air oven, dry heat, autoclaving, steam sterilization water etc, UV treatment.
  - e) Various methods of chemical treatment: formalin, glutaraldehyde
  - f) Instrument's etching, care of micro surgical and titanium instruments
  - g) Sterilization of equipments: arthroscope, gastro scope, imago lamp, apparatus, suction apparatus, anaesthetic equipments including endotracheal tubes.
  - h) OT Sterilization including laminar air flow.
  - i) Trouble shooting: colored spots and corrosion, staining, dust deposit, recent amendment in EPA with reference to waste disposal.
2. Anesthesia Service, history, pre-operative, intra operative & post operative care.
3. General anesthesia techniques.
4. Local anesthesia techniques.

**PAPER IV (BOTT 304)**  
**Applied Pathology I**

**1. Cardiovascular system**

- a) Atherosclerosis: definition, risk factors, briefly pathogenesis & morphology, clinical significance and prevention.
- b) Hypertension: definition, types and briefly pathogenesis and effects of hypertension.
- c) Aneurysms: definition, classification, pathology and complications.
- d) Pathophysiology of heart failure.
- e) Cardiac hypertrophy: causes, pathophysiology & progression to heart failure.
- f) Ischaemic heart diseases: definition, types, pathophysiology, pathology & complications of various types of IHD.
- g) Valvular heart diseases: causes, pathology & complication. Complications of artificial valves.
- h) Cardiomyopathy: definition, types, causes and significance.
- i) Pericardial effusion: causes, effects and diagnosis.
- j) Congenital heart diseases: basic defect and effects of important types of congenital heart diseases.

**2. Haematology**

- a) Anaemia: definition, morphological types and diagnosis of anaemia, brief concept about haemolytic anaemia and polycythaemia.
- b) Leukocyte disorders: leukaemia, leukocytosis, agranulocytosis etc.
- c) Bleeding disorders: definition, classification, causes & effects of important types of bleeding disorders, various laboratory tests used to diagnose bleeding disorders.

**PRACTICALS**

1. Description & diagnosis of the following gross specimens.
  - a) Atherosclerosis.
  - b) Aortic aneurysm.
  - c) Myocardial infarction.

- d) Emphysema
- 2. Interpretation & diagnosis of the following charts.
  - a) Hematology chart: AML, CML, hemophilia, neutrophilia, eosinophilia.
- 3. Estimation of hemoglobin.
- 4. Estimation of bleeding & clotting time.

**Paper-V (BOTT 305)**  
**Applied Microbiology I**

1. Health care associated infections and antimicrobial resistance: infections that patients acquire during the course of receiving treatment for other conditions within a healthcare setting like methicillin resistant Staphylococcus aureus infections, infections caused by Clostridium difficile, vancomycin resistant enterococci etc, catheter related blood stream infections, ventilator associated pneumonia, catheter related urinary tract infections, surveillance of emerging resistance and changing flora, the impact and cost attributed to hospital associated infection.

2. Disease communicable to healthcare workers in hospital set up and its preventive measures, occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicella-zoster, respiratory syncytial virus etc), blood borne transmission ( HIV, hepatitis B, hepatitis C, cytomegalovirus, Ebola virus etc), oro faecal route ( salmonella, hepatitis A etc), direct contact ( Herpes simplex virus etc), preventive measures to combat the spread of these infections by monitoring and control. (6hours).

**PRACTICALS**

- 1. Disinfection of wards, OT and laboratory.

**Fourth Semester**  
**Paper-I (BOTT 401)**  
**Pharmacology II**

**1. Autonomic nerves system.**

- a) Anatomy & functional organisation.
- b) List of drugs acting on ANS including dose, route of administration, indications, contra indications and adverse effects.

**2. Cardiovascular drugs.**

Mode of action, side effects and therapeutic uses of the following drugs:

- a) Anti hypertensives:
  - i. Beta adrenergic antagonists.
  - ii. Alpha adrenergic antagonists.
  - iii. Peripheral vasodilators.
  - iv. Calcium channel blockers.
- b) Anti arrhythmic drugs.
- c) Cardiac glycosides.
- d) Sympathetic and non sympathetic inotropic agents.
- e) Coronary vasodilators.
- f) Anti anginal and anti failure agents.
- g) Lipid lowering & anti atherosclerotic drugs.
- h) Drugs used in haemostasis: anticoagulants thrombolytics and anti thrombolytics.
- i) Cardioplegic drugs: history, principles and types of cardioplegia.
- j) Primary solutions: history, principles & types.
- k) Drugs used in the treatment of shock.

**3. CNS stimulants and depressants**

- a) Alcohol.
- b) Sedatives, hypnotics and narcotics.
- c) CNS stimulants.
- d) Neuromuscular blocking agents and muscle relaxants.

**4. Pharmacological protection of organs during CPB**

**5. Inhalational gases and emergency drugs.**

**6. Pharmacotherapy of respiratory disorders**

- a) Introduction: modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone.
- b) Pharmacotherapy of bronchial asthma.
- c) Pharmacotherapy of cough.
- d) Mucokinetic and mucolytic agents.
- e) Use of bland aerosols in respiratory care.

**7. Miscellaneous.**

- a) IV fluids- various preparations and their usage.
- b) Electrolyte supplements.
- c) Immunosuppressive agents.
- d) New drugs included in perfusion technology.
- e) Drugs used in metabolic and electrolyte imbalance.

**RECOMMENDED BOOKS.**

- 1. R.S. Satoskar, S.D. Bhandarkar, S.S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, single Volume, M/S Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay - 400 034.
- 2. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post

Box, 7193, G-16, EMCA House, 23/23, Bansari Road, Daryaganj, New Delhi.  
3. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.

**PAPER II (BOTT 402)**  
**Medicine Relevant to Operation Theatre Technology II**

1. COPD.
2. Chronic renal failure.
3. Chronic liver disease/failure.
4. Anemia.
5. Pediatric patient, infant/neonate.
6. Epilepsy.
7. CVA.

**PAPER III (BOTT 403)**  
**Introduction to Operation Theatre Technology II**

1. Blood transfusion.
2. Monitoring in the operation theatre
3. Positioning of patient
4. Instrument planning for various surgical procedure and auxiliary instrumentation.
5. OT techniques, OT environment, control of infection scrubbing, theatre cloths including lead apron and goggles.
6. Duties of nurses: ethics, behaviour during surgery, etc.

**PAPER IV (BOTT 404)**  
**Applied Pathology II**

**1. Respiratory system**

- a) Chronic obstructive airway diseases: definition and types, causes, pathology and complications of each type of COPD.
- b) Concept about obstructive versus restrictive pulmonary disease.
- c) Pneumoconiosis: definition, types, pathology and effects.
- d) Pulmonary congestion and edema.
- e) Pleural effusion: causes, effects and diagnosis.

**2. Renal system**

- a) Clinical manifestations of renal diseases, causes, mechanism, effects and laboratory diagnosis of ARF & CRF, glomerulonephritis and pyelonephritis.
- b) End stage renal disease: definition, causes, effects and role of dialysis and renal transplantation in its management.
- c) Brief concept about obstructive uropathy.

**Practical's**

1. Description & diagnosis of the following gross specimens.
  - a) Chronic glomerulonephritis.
  - b) Chronic pyelonephritis.
2. Interpretation & diagnosis of the following charts.
  - a) Urine Chart: ARF, CRF, acute glomerulonephritis.

**Paper-V (BOTT 405)**  
**Applied Microbiology II**

1 Microbiological surveillance and sampling, required to determine the frequency of potential bacterial pathogens including *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis* and also to assess the antimicrobial resistance, sampling: rinse technique, direct surface agar plating technique. (6 hours).

2. Importance of sterilization.

- a) Disinfection of instruments used in patient care: classification, different methods, advantages and disadvantages of the various methods.
- b) Disinfection of the patient care unit.
- c) Infection control measures for ICU's.

3. Sterilization:

- a) Rooms: gaseous sterilization, one atmosphere uniform glow discharge plasma (OAUGDP).
- b) Equipments: classification of the instruments and appropriate methods of sterilization.
- c) Central supply department: the four areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas.

4. Preparation of materials for autoclaving: packing of different types of materials, loading, holding time and unloading.

**PRACTICALS**

1. Principles of autoclaving & quality control of sterilization.
2. Collection of specimen from outpatient units, inpatient units, minor operation theatre and major operation theatre for sterility testing.
3. The various methods employed for sterility testing.
4. Interpretation of results of sterility testing.

**FIFTH SEMESTER**  
**Paper I BOTT 501**  
**Operation Theatre Technology – Clinical I**

1. Physical facility.
2. Layout of operation theatres.
3. Transition.
4. Peripheral support areas.
5. Operating room.
6. Special procedure rooms.
7. Potential sources of injury to the care giver & patient.
8. Principles of asepsis & sterile technologies.
9. Asepsis, surgical scrub, gowning & gloving
10. Decontamination & disinfections.
11. Sterilization assembly & packing.
12. Thermal sterilization.
13. Chemical sterilization.
14. Radiation sterilization.
15. Surgical instrumentation.
16. Fabrication.
17. Classification.

### **Paper II BOTT 502**

#### **Operation Theatre Technology – Applied I**

1. Preoperative preparation of the patient.
2. Diagnostic procedures.
3. Pathological examination.
4. Radiological examination.
5. MRI.
6. Nuclear medicine studies.
7. Ultra sonography.
8. Endoscopy.
9. Anaesthesia techniques.
10. Historical background.
11. Types of anaesthesia.
12. Choice of anaesthesia.
13. General anaesthesia.
14. Indication of general anaesthesia.
15. Endo tracheal intubation.

### **Paper III BOTT 503**

#### **Operation Theatre Technology – Advanced I**

1. Preparation, nursing requirement, equipments including instruments, sutures, etc.
2. Anesthesia techniques, patient positioning & recovery.
3. Gynecological /obstetric surgery.
4. Urologic surgery.
5. Orthopedic surgery.
6. Neurosurgery.
7. Ophthalmic surgery.

### **Paper IV BOTT 504**

#### **Bio Statistics and Research methodology I**

##### **1. Course description**

Introduction to basic statistical concepts.

Methods of statistical analysis and interpretation of data.

Introduction to research methodology

##### **2. Objectives**

Understands statistical terms.

Possesses knowledge and skills in the use of basic statistical and research methodology.

##### **3. Contents**

###### **a) Unit – I: Introduction**

- i. Meaning, definitions, and types of statistics.
- ii. Statistics as a singular and plural noun
- iii. Branches of statistics.
- iv. Application of statistics in medicine.

###### **b) Unit – II: Presentation of data**

- i. Definition and types of data
- ii. Raw data, the array, frequency distribution.
- iii. Basic definitions and principles of tabular presentation
- iv. Basic principles of graphical representation.
- v. Types of diagrams: Bar, pie, line, histograms, pictogram.

### **c) Unit - III: Measure of central tendency**

- i. Need for measures of central tendency.
- ii. Definition and calculation of mean: ungrouped and grouped.
- iii. Meaning, interpretation and calculation of median ungrouped and grouped.
- iv. Meaning and calculation of mode ungrouped and grouped.
- v. Selection of an appropriate measure of central tendency.

#### **RECOMMENDED BOOKS:**

- 1) KR Sundaram, SN Dwivedi and V Sreenivas (2010): Medical Statistics, Principles and Methods, BI Publications Pvt Ltd, New Delhi, India.
- 2) A Indrayan (2008): Basic Methods of Medical Research, Second edition, AITBS Publishers, India.
- 3) NSN Rao and NS Murthy (2008): Applied Statistics in Health Sciences, First Edition, JAYPEE brothers medical publishers (P) Ltd, India.
- 4) A. Mustafa (2010): Research Methodology, First edition, AITBS Publishers, India

### **Paper-V BOTT 505** **Health care and Ethics I**

#### **Health care**

- a) What is nursing? Nursing principles, inter-personnel relationships.
- b) Bandaging: basic turns, bandaging extremities, triangular bandages and their application.
- c) Nursing position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep.
- d) Lifting and transporting patients: lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher.
- e) Bed side management: giving and taking bed pan, urinal.
- f) Observation of stools, urine, sputum

#### **Ethic**

- a. Introduction to medical ethics-What is ethics, what are values and norms, freedom and personal responsibility?
- b. Definition of medical ethics-Major principles of medical ethics.
- c. Perspective of medical ethics-The Hippocratic oath, The Declaration of Helsinki, The WHO Declaration of Geneva, International code of Medical Ethics (1993), Medical Council of India Code of Ethics (2002).
- d. Ethics of the individual-Truth and confidentiality, the concept of disease, health and healing, the right to health.



**Sixth Semester**  
**Paper I BOTT 601**  
**Operation Theatre Technology – Clinical II**

1. Powered surgical instruments.
2. Handling instruments.
3. Specialized surgical equipment.
4. Electro cautery.
5. Laser.
6. Microsurgery.
7. Ultra sonography.
8. Positioning, preparing and draping the patient.
9. General surgery.
10. Breast procedures.
11. Abdominal surgery.
12. Liver procedure.
13. Splenic procedures.
14. Pancreatic procedures.
15. Oesophageal procedures.

**Paper II BOTT 602**  
**Operation Theatre Technology – Applied II**

1. Maintenance.
2. Monitoring.
3. Emergency.
4. Balanced anaesthesia.
5. Care of anaesthetized patient.
6. Local & regional anaesthesia.
7. Spinal and epidural anaesthesia.
8. Intravenous anaesthesia agents.
9. Inhalation anaesthetic agents.
10. Anaesthetic adjuvant drugs.
11. Complication of general anaesthesia.
12. Complication of local/regional anaesthesia.
13. Blood transfusion.
14. Anaesthesia machine & central gas supply.
15. Difficult intubation.

**Paper III BOTT 603**  
**Operation Theatre Technology – Advanced II**

1. Plastic and reconstructive surgery.
2. Otorhino laryngological and head and neck surgery.
3. Thoracic surgery.
4. Cardiac surgery.
5. Vascular surgery.
6. Organ procurement and transplantation.
7. Thyroid surgery.

**Paper IV BOTT 604**

## Bio statistics and research methodology II

### 1. Contents

#### a) Unit - IV: Measure of variability

- i. Need for measure of variation.
- ii. Range and mean deviation.
- iii. Variance and standard deviation.
- iv. Calculation of variance and standard deviation ungrouped and grouped.
- v. Properties and uses of variance and SD.

#### b) Unit -V: Probability and standard distributions.

- i. Meaning of probability and standard distributions.
- ii. Priori and posteriori probabilities
- iii. The Binominal and Poisson distributions.
- iv. The normal distribution.
- v. Divergence from normality: skewness, kurtosis.

#### c) Unit - VI: Sampling techniques

- i. Population, sample and sampling.
- ii. Methods and types of sampling.
- iii. Random and non-random sampling
- iv. Parameter and statistic.
- v. Basic concepts and terms related to test of significance.

#### d) Unit - VII: Introduction to research methodology

- i. Definition and characteristics of research.
- ii. Levels and types of research.
- iii. Experimental and non-experimental study designs.
- iv. Definitions of case report, case series, case-control and cohort studies.

#### RECOMMENDED BOOKS:

- 1) KR Sundaram, SN Dwivedi and V Sreenivas (2010): Medical Statistics, Principles and Methods, BI Publications Pvt Ltd, New Delhi, India.
- 2) A Indrayan (2008): Basic Methods of Medical Research, Second edition, AITBS Publishers, India.
- 3) NSN Rao and NS Murthy (2008): Applied Statistics in Health Sciences, First Edition, JAYPEE brothers medical publishers (P) Ltd, India.
- 4) A. Mustafa (2010): Research Methodology, First edition, AITBS Publishers, India

### **Paper IV BOTT 604** **Health Care and Ethics II**

#### Health Care

1. Use and care of catheters, enema giving.
2. Methods of giving nourishment: feeding, tube feeding, drips, transfusion.
3. Care of rubber goods.
4. Recording of body temperature, respiration and pulse.
5. Simple aseptic techniques, sterilization and disinfection.
6. Surgical dressing: observation of dressing procedures

#### Ethics

1. The ethics of human life-Prenatal sex determination.
2. The family and society in medical ethics-Euthanasia, cancer and terminal care.
3. Death and dying-Use of life-support systems, the right to die with dignity, suicide – the ethical Outlook.
4. Professional Ethics-Contract and confidentiality, malpractice and negligence.