PONDICHERRY UNIVERSITY

Puducherry

Regulations and Syllabus

Bachelor of Science in

OPERATION THEATRE & ANAESTHESIA TECHNOLOGY

(B.Sc. OTAT)

2024-2025

Index

PONDICHERRY UNIVERSITY

Puducherry

REGULATIONS OF THE UNIVERSITY

I. SHORT TITLE AND COMMENCEMENT

These regulations shall be called **"THE REGULATIONS FOR THE BACHELOR OF SCIENCE IN OPERATION THEATRE & ANAESTHESIA TECHNOLOGY OF PONDICHERRY UNIVERSITY,** Puducherry".

They shall come into force from the academic year 2024-25 Session.

The regulation and syllabi are subject to modifications by the standing Under Graduate Board of Studies for OPERATION THEATRE & ANAESTHESIA TECHNOLOGYcourses from time to time.

II. COURSE PHILOSOPHY

Aim:

The aim of the B.Sc in Operation Theatre and Anaesthesia Technology (OTAT) course is to produce skilled and competent professionals capable of managing operation theatres and assisting in anaesthesia procedures with precision, safety, and compassion. Graduates will be equipped to contribute effectively to healthcare teams, ensuring optimal patient care during surgical interventions.

Objectives:

On completion of B.Sc Operation Theatre and Anaesthesia Technology Program the graduates will be able to:

Technical Skills Development: Equip students with the knowledge and skills required to assist in operation theatres, including setting up for surgeries, maintaining sterile environments, and handling surgical instruments and equipment.

Anaesthesia Management: Provide comprehensive understanding of anaesthesia techniques, medications, and equipment, enabling students to assist anaesthesiologists in administering and monitoring anaesthesia during surgical procedures.

Patient Care and Safety: Train students in patient care principles specific to perioperative settings, focusing on ensuring patient safety, comfort, and well-being before, during, and after surgery.

Medical Knowledge: Foster a deep understanding of anatomy, physiology, pharmacology, and pathology relevant to surgical procedures and anaesthesia management.

Team Collaboration: Develop effective communication and teamwork skills necessary for seamless interaction with surgeons, anaesthesiologists, nurses, and other healthcare professionals in the operation theatre environment.

Emergency Response: Prepare students to recognize and respond to emergencies within operation theatres, including cardiac arrest, airway management issues, and other critical incidents.

Ethical and Professional Standards: In still ethical principles, professionalism, and respect for patient rights and confidentiality in all aspects of patient care and professional practice.

Clinical Experience: Provide practical, hands-on training through clinical rotations, internships, and simulation exercises to apply theoretical knowledge in real-world scenarios, gaining confidence and competence in operation theatre and anaesthesia technology roles.

Continuous Learning and Adaptation: Encourage lifelong learning, professional development, and adaptation to advances in medical technology and surgical practices, preparing graduates to stay current in their field throughout their careers.

Quality Improvement: Promote a culture of quality improvement and patient safety in operation theatres, emphasizing best practices, infection control measures, and adherence to regulatory standards.

III. Program Outcome:

- Upon the completion of the course:

- **Clinical Proficiency**: Graduates demonstrate advanced clinical skills in Operation Theatre and Anaesthesia Technology procedures, patient assessment, and trauma care, ensuring effective and efficient delivery of emergency healthcare.

- **Technological Competence**: They exhibit expertise in operating and maintaining modern medical equipment and technologies, enhancing diagnostic accuracy and treatment efficacy.

- **Effective Communication**: Graduates communicate clearly and empathetically with patients, families, and healthcare teams, fostering trust, understanding, and collaboration in high-stress environments.
- **Critical Thinking and Decision-making**: They analyze complex situations, prioritize patient needs, and make informed decisions swiftly, optimizing outcomes and safety related to Operation Theatre and Anaesthesia procedures.
- **Ethical Practice and Professionalism**: Graduates uphold ethical standards, confidentiality, and patient rights, demonstrating professionalism, integrity, and cultural sensitivity in their interactions and decision-making processes.
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IV. REGULATIONS

1. ELIGIBILITY FOR ADMISSION:

The admission for B.Sc in Operation Theatre and Anaesthesia Technology (OTAT) is based on the CENTAC process. The reservation and other process are as per the Government norms. Candidates should have completed a minimum of 17 years of age as on 31st December of the year of admission. The upper age limit is 25 years. (Relaxation up to 5 years for SC/ST candidate and up to 3 years for MBC/OBC candidates.)

Candidates should have a pass in the Higher Secondary Examination conducted by the Board of Higher Secondary Examination of Tamil Nadu, or any other equivalent examination accepted by the University, thereto with a minimum of 50% marks (40% marks for SC, ST, MBC and OBC candidates)

in aggregate of Science subjects (Physics, Chemistry, Biology/Botany & Zoology) and should have English as one of the subjects.

Candidate shall be medically fit to undergo the Operation Theatre and Anaesthesia Technology program.

For Lateral entry: Diploma in Operation Theatre and Anaesthesia Technology (OTAT) courses approved by the Government after completing 12th Class / 10 +2 of CBSE or equivalent with minimum aggregate of 50% marks (40% marks for SC, ST, MBC and OBC candidates) in Physics, Chemistry and Biology provided the candidate has passed in each subject separately. The age limit is 35 years. The Government service candidates will be exempted if approved by the committee or the Government.

Provision for lateral entry: lateral entry to second year for B.Sc in Operation Theatre and Anaesthesia Technology (OTAT)program for candidates who have passed Diploma program in Operation Theatre and Anaesthesia Technology from the Government Boards and recognized by State / Central University, full filling the conditions specified and these students are eligible to take admission on lateral entry system only if the same subject have been studies at 10+2 scheme and diploma level. The admission process is as per the Government rule and regulations from time to time. Students to be admitted under lateral entry shall be 10% over and above the sanctioned intake.

The lateral entry candidates have the direct entry into the second year (i.e from III semester) are exempted from the first year (Semester – I and Semester – II) curriculum. For the grant of the University degree the lateral entry candidates have to complete the semester – III to Semester – VI, and the internship compulsory and mandatory.

2. DURATION OF THE COURSE AND COURSE OF STUDY:

The duration of the program shall be **Three years / Lateral entry two years** of full-time study and **One year of compulsory rotatory internship**.

3. MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the subjects of study and for examinations of the Course.

4. PROGRAM DETAIL:

The program structure is shown in Table I.

The detailed syllabus in respect of the program is appended to this regulation.

5. ATTENDANCE:

Examination will be conducted in both theory and practical, as prescribed.

Candidate will be permitted to appear for the University Examination in the subject only if they secure not less than 80% attendance (irrespective of the kind of absence) in each subject of that semester.

Condonation of shortage of attendance in aggregate upto 10% in each semester may be granted by the College Academic Committee and as per regulations of University. For Students internship offered during VII and VIII semesters, 100% attendance is compulsory. However, the students may be condoned upto 15%, under extraordinary situation, by the Dean/Principal based on the genuineness of the case upon the recommendation of the concern program teaching and Head of the Department.
The students failing to attend classes/examinations on non-official ground will be treated as absent. Student deputed for Sports, Cultural Meets, etc with prior permission of Dean/Principal of the College shall be given attendance for the period of absent.

6. INTERNAL ASSESSMENT:

Internal assessment will be done in each subject of study and the marks will be awarded to the candidates as detailed in the scheme of examinations.

The marks awarded will be on the basis of the candidate's performance in assessment, class tests, clinical/laboratory work, preparation and seminar presentation assessed by the concerned faculty.

The marks secured by the candidate during each semester in each subject shall be forwarded to the University at the end of the semester, i.e., before the commencement of the written examination.

7. EXAMINATIONS:

The University Examinations will be conducted in semester pattern for all the three years, each year consisting of two semesters.
The particulars of subjects for various examinations and distribution of marks are shown separately.
The examination for the main subjects will be conducted by the University and for the non-examination subjects by the college.
The maximum number of candidates for practical examination should not exceed 20 per day.
One internal and one external examiner should jointly conduct practical examination for each student.
An examiner should not be below the rank of an Assistant Professor or Tutor/Demonstrator.

8. PASSING MINIMUM

Candidate has to pass separately in theory + Viva voce and Practical by getting a minimum of 50% marks in combined internal assessment and University examination. A candidate should secure 50% of the marks in theory and 50% in practical (wherever prescribed)

If a candidate fails in either theory or practical, he/she has to re-appear for both theory and practical.

A candidate should secure 50% of total marks in the test conducted by the college for the non-examination subject.

9. PROCEDURE FOR PASSING THE PROGRAME

The maximum period to complete the program successfully **should not exceed a period of eight years.**

10. INTERNSHIP

There shall be a compulsory full-time rotatory internship after the candidate having passed all the subjects prescribed in the scheme of examination.

The internship should be done for a period of one year, in an Institution/ Hospital approved.

No candidate shall be eligible for the award of the degree without successfully completing one-year internship.

Desirable: A Research study to be done and submit the report before the one year of Internship. One or more value added courses (like Swayam) during final year or Internship.

11. ELIGIBILITY FOR AWARD OF DEGREE:

The candidates shall be eligible for the ***Degree of B.Sc in Operation Theatre and Anaesthesia Technologyand / lateral entry*** when they have undergone the prescribed program of study for a ***period of three years / two years (for lateral entry)*** in an institution approved by the University and have ***passed the prescribed examinations in all subjects*** and ***have completed a compulsory internship over a period of one year*** in an approved institution.

12. DECLERATION OF CLASS:

A successful candidate obtaining **75% and more marks** in the grand total aggregate in the **First attempt** shall be declared to have passed these subjects with **Distinction**.

A successful candidate obtaining **60% and more but less than 74.9% marks** in the grand total aggregate in the **First attempt** shall be declared to have passed with **First Class**.

A successful candidate obtaining **50% and more but less than 59.9% marks** in the grand total aggregate in the **First attempt** and the candidate who passed with more than one attempt irrespective of the percentage of marks secured shall be declared to have passed these subjects with **Second Class.**

Ranks shall be declared on the basis of the aggregate marks obtained by a candidate in the University examination subjects of the program.

Only those candidates **who have passed all the subjects in all examinations in the First attempt shall be eligible for the Award of rank.**

V Program Structure–OPERATION THEATRE & ANAESTHESIA TECHNOLOGY

TABLE – 1

Year	Sem	Code	Subject Title	Hours			
				Theory	Practical	Clinical	Total
I Year	I Sem	BOTAT – 001	Anatomy	60	30	-	90
		BOTAT – 002	Physiology	60	30	-	90
		BOTAT – 003	Biochemistry	60	30		90
		BOTAT – C01	Communication and Soft skill	60	-	-	60
			Library/Co-curricular	30			30
			Clinical Hours			140	140
			Total Hours	**270**	**90**	**140**	**500**
	II Sem	BOTAT –004	Applied Pathology	60	30	-	90
		BOTAT –005	Applied Microbiology	60	30	-	90
		BOTAT –006	Applied Pharmacology	60	30	-	90
		BOTAT –C02	Computer Application	30	30	-	60
			Library/Co-curricular	30			30
			Clinical Hours			240	240
			Total	**240**	**120**	**240**	**600**
		I Year Over all Total		**510**	**210**	**380**	**1100**
II Year	III Sem						
		BOTAT –007	CSSD including Sterilization	60		210	270
		BOTAT –008	Introduction to Operation Theatre& Anesthesia Techniques	60	-	210	270
		BOTAT –C03	Quality Assurance & Patient Safety	30	-	-	30
			Library/Co-curricular	30			30
			Total Hours	**180**		**420**	**600**
	IV Sem	BOTAT –009	Medicine and Non –Operative Room Related Anesthesia	60	-	210	270
		BOTAT –010	Introduction to Basic Surgery and Surgical Techniques	60	-	210	270
		BOTAT –C04	Physiotherapy	30	-	-	30
			Library/Co-curricular	30			30
			Total Hours	**180**		**420**	**600**
			II Year Over all Total	**360**	**0**	**840**	**1200**
III Year	V Sem	BOTAT –011	Anesthesia for ENT, Ophthalmic & Ortho surgery	60	-	210	270
		BOTAT -012	Anesthesia for OG& Pediatrics surgery	60	-	210	270
		BOTAT –C05	Biostatistics & Research Methodology	30	-	-	30
			Library/Co-curricular	30			30
			Total	**180**	**0**	**420**	**600**
	VI Sem	BOTAT –013	Anesthesia for Superspeciality- Uro Surgery, Neurosurgery, Cardiothoracic Surgery	60	-	210	270
		BOTAT -014	Anesthesia for Transplant & Trauma Management	60	-	210	270
		BOTAT –C06	Medical Law & Ethics & Practice Management	30	-	-	30
			Library/Co-curricular	30			30
			Total	**180**	**0**	**420**	**600**
			III Year Over all Total	**360**	**0**	**840**	**1200**
VI Year	**Internship**						**1 Year**

Note: BOTAT C01 to BOTAT C06 - Subsidiary Subjects

SCHEME OF INTERNSHIP PROGRAM (1 YEAR)

S.No	Clinical Posting Area	Duration (Months)
1	CSSD including Sterilization	1
2	Medicine and Non –Operative Room Related Anesthesia	2
3	Anesthesia Related to Basic Surgery	2
4	Anesthesia for ENT, Ophthalmic & Ortho surgery	2
5	Anesthesia for OG& Pediatrics surgery	2
6	Anesthesia for Superspeciality- Uro Surgery, Neurosurgery, Cardiothoracic Surgery	2
7	Anesthesia for Transplant & Trauma Management	1
Total		**12**

VI Scheme of Examination with mark details

TABLE - II

Sem	Code	Subject	University marks		Internal Marks		Viva		Total		Total Theory+Practical	
		Theory & Practical	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
I Sem	BOTAT–001	Anatomy -Theory	80	32	25	-	20	10	125	63	200	100
		Anatomy -**Practical**	50	25	25	-			75	37		
	BOTAT–002	Physiology - Theory	80	32	25	-	20	10	125	63	200	100
		Physiology - **Practical**	50	25	25	-			75	37		
	BOTAT–003	Biochemistry-Theory	75	30	25	-			100	50	100	50
	BOTAT–C01	Communication and Soft skills	-	-	50	25	-	-	50	25	50	25
II Sem	BOTAT–004	Applied Pathology -Theory	80	32	25	-	20	10	125	63	200	100
		Applied Pathology - **Practical**	50	25	25	-			75	37		
	BOTAT–005	Applied Microbiology - Theory	80	32	25	-	20	10	125	63	200	100
		Applied Microbiology - **Practical**	50	25	25	-			75	37		
	BOTAT–006	Applied Pharmacology - Theory	75	30	25	-			100	50	100	50
	BOTAT-C02	Computer application	-	-	50	25	-	-	50	25	50	25
III sem	BOTAT –007	CSSD including Sterilization	75	30	25	-			100	50	100	50
	BOTAT–008	Introduction to Operation Theatre& Anesthesia Techniques	80	32	25	-	20	10	125	63	200	100
		Introduction to Operation Theatre& Anesthesia Techniques -**Practical**	50	25	25	-			75	37		
	BOTAT–C03	Quality Assurance & Patient Safety	-	-	50	25	-	-	50	25	50	25
IV sem	BOTAT–009	Medicine and Non –Operative Room Related Anesthesia	75	30	25	-			100	50	100	50
	BOTAT–010	Introduction to Basic Surgery and Surgical Techniques	80	32	25	-	20	10	125	63	200	100
		Introduction to Basic Surgery and Surgical Techniques- **Practical**	50	25	25	-			75	37		
	BOTAT–C04	Physiotherapy	-	-	50	25	-	-	50	25	50	25
V sem	BOTAT–011	Anesthesia for ENT, Ophthalmic & Ortho surgery	80	32	25	-	20	10	125	63	200	100
		Anesthesia for ENT, Ophthalmic & Ortho surgery -	50	25	25	-			75	37		

		Practical										
	BOTAT-012	Anesthesia for OG& Pediatrics surgery	80	32	25	-	20	10	125	63	200	100
		Anesthesia for OG& Pediatrics surgery **-Practical**	50	25	25	-			75	37		
	BOTAT–C05	Biostatistics & Research Methodology	-	-	50	25	-	-	50	25	50	25
VI sem	BOTAT–013	Anesthesia for Superspeciality- Uro Surgery, Neurosurgery, Cardiothoracic Surgery	80	32	25	-	20	10	125	63	200	100
		Anesthesia for Superspeciality- Uro Surgery, Neurosurgery, Cardiothoracic Surgery **-Practical**	50	25	25	-			75	37		
	BOTAT -014	Anesthesia for Transplant & Trauma Management	80	32	25	-	20	10	125	63	200	100
		Anesthesia for Transplant & Trauma Management **- Practical**	50	25	25	-			75	37		
	BOTAT–C06	Medical Law & Ethics & Practice Management	-	-	50	25	-	-	50	25	50	25

COURSE DESCRIPTION

1. ANATOMY
Course Code: BOTAT-001

Placement: Ist Year (Ist Semester) **Time:** Theory: 60 Hours
Practical: 30 Hours

Course Description: The course is designed to assists students to acquire comprehensive knowledge of the normal structure of human body, to facilitate understanding of anatomical basic health, identify alteration in structure with emphasis on clinical application to practice.

UNIT- I (15 Hrs)

Introduction to Anatomy and Organization of the Human Body

- Introduction to Anatomical terms relative to position - anterior, ventral, posterior dorsal, superior, inferior, median, lateral, proximal distal superficial, deep, prone, supine, palmar and planter
- Anatomical planes (axial/ transverse /horizontal, sagittal /vertical plane and coronal/ frontal/ oblique plain)
- Movement (flexion, extension, abduction, adduction, medial, rotation lateral rotation, inversion, eversion, supination, pronation, plantar flexion, dorsi flexion and circumduction)
- Cell structure, cell division
- Tissues – Definition, types, characteristic, classification, location
- Membranes and glands -classification and structures
- Identify major surface and body landmarks in each body region organization of human body
- Hyaline, fibro cartilages elastic cartilages
- Features of skeletal, smooth and Cardiac muscles

UNIT-II (5 Hrs)

The Respiratory System

- Structures of organ of Respiration
- Muscles of Respiratory System

UNIT-III (5 Hrs)

The Digestive System

- Structures of alimentary canal and organs of digestion

UNIT-IV (5 Hrs)

The Circulatory and Lymphatic system

- Structures of blood components, anterior and venous system
- Position of heart related to Associated structures
- Chambers of heart, layers of heart
- Nerve supply to and blood supply to heart
- Veins used for IV injections
- Lymphatic tissues

UNIT-V (3 Hrs)

The Endocrine System

- Structures of hypothalamus, Pineal gland, Pituitary gland, Thyroid Parathyroid, Thymus, Pancreas and Adrenal gland.

UNIT-VI (3 Hrs)

The Sensory organ

- Structures of skin, eyes, ears, nose and tongue.

UNIT – VII (10 Hrs)

The Musculo Skeletal System

Muscular Systems

- Types and structures of muscles
- Muscle groups - Muscles of head, neck, thorax, abdominal, pelvis upper and lower Limb
- Principles of Muscles – deltoid, biceps, triceps, respiratory, abdominal, pelvic floor muscles gluteal muscle and vastus laterals
- Major muscles involved in procedure

Skeletal System

- Anatomical position
- Bones - type, structures, growth and ossification
- Axial and appendicular skeleton
- Joints – Classification, major joints and structures

UNIT-VIII (5 Hrs)

The Nervous Systems

- Review and structures of neurons
- Central Nervous system, Autonomic Nervous system, and Peripheral Nervous system
- Structures of brain, spinal cord, cranial nerve, spinal nerves, functional areas of cerebral cortex
- Ventricles of the brain- formation, circulation and drainage

UNIT-IX (4 Hrs)

The Renal System

- Structures of Kidney, Ureters, bladder, urethra

UNIT-X (5 Hrs)

The Reproductive System

- Structures of Male Reproductive Organs
- Structures of Female Reproductive Organs
- Structures of Breast

PRACTICAL'S:

- Histology of Types of Epithelium
- Histology of Serous, Mucous and Mixed Salivary gland
- Histology of the types of Cartilage

- Demo of all bones showing parts, radiographs of normal bones & Joints
- Histology of Skeletal (TS & LS), Smooth and Cardiac muscle
- Demonstration of Heart and Vessels of the body
- Histology of Large artery, Medium sized artery and vein, Large Vein
- Microscopic appearance of Large and Medium sized Artery and Vein, Large Vein
- Demonstration of all muscles of the body
- Pericardium
- Histology of Lymph node, Spleen, Tonsil and Thymus
- Demonstration of parts of Respiratory system
- Normal Chest radiograph showing Heart shadows
- Histology of Lung and Trachea
- Normal Angiograms
- Histology of Lymphatic tissues
- Radiographs of Abdomen – IVP, Retrograde cystogram
- Demonstration of parts of the Urinary system and Histology of Kidney, Ureter and Urinary bladder
- Demonstration of Male and Female Pelvis with organs in situ.
- Histology of Male and Female Reproductive organs
- Histology of Pituitary, Thyroid, parathyriod and Suprarenal glands
- Histology of peripheral nerve and optic nerve.
- Demo of all parts of brain.

Reference Books:

1. Inderbir Singh, Textbook of Anatomy, Jaypee, 7th Edi, Vol I to III, 2019
2. Chaurasia, Human Anatomy, CBS Publisher, 5th Edi, Vol 1 to 3, 2010.
3. Ross and Wilson Anatomy and Physiology in Health and illness, Elsever, 13th Edi, 2018.

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Identification of Gross Spotters	30 marks
Identification of Histological slides	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

2. PHYSIOLOGY
Course Code: BOTAT-002

Placement: Ist Year (Ist Semester) **Time:** Theory: 60 Hours
Practical: 30 Hours (Lab)

Course Description: The course is designed to assist students to acquire comprehensive knowledge of the normal functions of the organ systems of the human body to facilitate understanding of physiological basis of health, identify alteration in functions and provide the student with necessary physiological knowledge to practice.

COURSE OUTLINE

UNIT - I (4 Hrs)

General Physiology – Basic concepts

- Cell physiology including transportation across cell membrane
- Body fluid compartments, Distribution of total body fluid, intracellular and extracellular compartments, major electrolytes and maintenance of homeostasis
- Cell cycle
- Tissue – formation, repair
- Membranes and glands – functions

UNIT - II (6 Hrs)

Respiratory system

- Functions of respiratory organs
- Physiology of respiration
- Pulmonary circulation – functional features
- Pulmonary ventilation, exchange of gases
- Carriage of oxygen and carbon-dioxide
- Exchange of gases in tissue
- Regulation of respiration
- Hypoxia, cyanosis, dyspnea, periodic breathing
- Respiratory changes during exercise

UNIT III (8 Hrs)

Digestive system

- Functions of the organs of digestive tract
- Saliva – composition, regulation of secretion and functions of saliva
- Composition and functions of gastric juice, mechanism and regulation of gastric secretion
- Composition of pancreatic juice, functions, regulation of pancreatic secretion
- Functions of liver, gall bladder and pancreas
- Composition of bile and functions
- Secretion and functions of small and large intestine
- Movements of alimentary tract
- Digestion in mouth, stomach, small intestine, large intestine, absorption of food

UNIT- IV (6 Hrs)

Circulatory and Lymphatic system

- Functions of heart, conduction system, cardiac cycle, Stroke volume and cardiac output
- Blood pressure and Pulse • Circulation – principles, factors influencing blood pressure, pulse
- Coronary circulation, Pulmonary and systemic circulation
- Heart rate – regulation of heart rate • Normal value and variations
- Cardiovascular homeostasis in exercise and posture

UNIT-V (5Hrs)

Blood

- Blood – Functions, Physical characteristics
- Formation of blood cells
- Erythropoiesis – Functions of RBC, RBC life cycle
- WBC – types, functions • Platelets – Functions and production of platelets
- Clotting mechanism of blood, clotting time, bleeding time, PTT
- Homeostasis – role of vasoconstriction, platelet plug formation in hemostasis, coagulation factors, intrinsic and extrinsic pathways of coagulation
- Blood groups and types
- Functions of reticuloendothelial system, immunity

UNIT-VI (5Hrs)

The Endocrine system

- Functions and hormones of Pineal Gland, Pituitary gland, Thyroid, Parathyroid, Thymus, Pancreas and Adrenal glands.
- Other hormones
- Endocrine Alterations in diseases

UNIT-VII (4Hrs)

The Sensory Organs

- Functions of skin
- Vision, hearing, taste and smell
- Errors of refraction, aging changes

UNIT-VIII (6Hrs)

Musculoskeletal system

- Bones – Functions, movements of bones of axial and appendicular skeleton, Bone healing
- Joints and joint movements
- Joint diseases
- Properties and Functions of skeletal muscles – mechanism of muscle contraction
- Structure and properties of cardiac muscles and smooth muscles

UNIT- IX (4Hrs)

Renal system

- Functions of kidney in maintaining homeostasis
- GFR
- Functions of ureters, bladder and urethra
- Micturition

- Regulation of renal functions

UNIT- X (4Hrs)

The Reproductive system

- Female reproductive system – Menstrual cycle, function and hormones of ovary, oogenesis, fertilization, implantation, Functions of breast
- Male reproductive system – Spermatogenesis, hormones and its functions, semen

UNIT- XI (8 Hrs)

Nervous system

- Overview of nervous system
- Review of types, structure and functions of neurons
- Nerve impulse
- Review functions of Brain-Medulla, Pons, Cerebrum, Cerebellum
- Sensory and Motor Nervous system
- Peripheral Nervous system
- Autonomic Nervous system
- Limbic system and higher mental Functions - Hippocampus, Thalamus, Hypothalamus
- Vestibular apparatus
- Functions of cranial nerves
- Autonomic functions
- Physiology of Pain-somatic, visceral and referred
- Reflexes
- CSF formation, composition, circulation of CSF, blood brain barrier and blood CSF barrier

Practical's :

- Hemoglobinometry
- White Blood Cell Count
- Red Blood Cell Count
- Determination of Blood Groups
- Leishman's Staining and Differential WBC Count
- Determination of Packed Cell Volume
- Erythrocyte Sedimentation Rate (ESR)
- Determination of Clotting Time, Bleeding Time
- Recording of Blood pleasure
- Auscultation for Heart sounds
- Artificial Respiration
- Determination of Vital capacity.

Reference Books :

1. Sembulingam (K), Essentials of Medical Physiology, Jaypee, 8th Edi, 2019.
2. Guyton & Hall, Textbook of Medical Physiology, Elsevier, 2nd Edi, 2018.
3. Pal (GK), Comprehensive Textbook of Medical Physiology, Jaypee, 2nd Edi, Vol I & II, 2019.
4. Surinder Singh, Principles of Human Physiology for Course in Nursing & Allied Health Sciences, CBS, 2017.
5. Ross and Wilson Anatomy and Physiology in Health and illness, Elsevier, 13th Edi, 2018.

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

3. BIOCHEMISTRY
Course Code: BOTAT-003

Placement:Ist Year (Ist Semester) **Time:** Theory: 60 Hours
Practical: 30 Hours (Lab)

Course Description: The course is designed to assist the students to acquire knowledge of the normal biochemical composition and functioning of human body, its alterations in disease conditions and to apply this knowledge in to practice.

COURSE OUTLINE

UNIT - I (3 Hrs)

- **Introduction to Biochemistry**

UNIT - II (3 Hrs)

- **Biophysical aspects of Biochemistry**

UNIT-III (7 Hrs)

Carbohydrates

- Chemistry of carbohydrates, Classification and biological importance
- Digestion and absorption, Glycolysis, glycogen metabolism, glucono-genesis, TCA cycle
- Regulation of blood glucose, Diabetes mellitus

UNIT-IV (7 Hrs)

Proteins

- Biological importance, Classification of amino acids & proteins
- Digestion and absorption
- Urea synthesis, Transamination

UNIT-V (7 Hrs)

Lipids

- Biological importance
- Classification of lipids, lipoproteins, Overview of lipid metabolism

UNIT-VI (6 Hrs)

Enzymes

- Classification, Factors affecting enzyme action
- Enzyme inhibition & Chemical enzymology

UNIT-VII (7 Hrs)

Endocrinology

- Hormones, Role of biological important hormones
- Pituitary, thyroid, adrenal cortex and medulla
- Sex hormones

UNIT-VIII (7 Hrs)

Mineral metabolism

- Regulation of blood level
- Consequences of excess and deficiency of calcium, Phosphate, iron, copper & zinc

UNIT-IX (7 Hrs)

Vitamins

- Fat soluble vitamins, Water soluble vitamins
- Biochemical function, Deficiency, Manifestation, Source & RDA

UNIT-X (6 Hrs)

Clinical Biochemistry

- LFT& RFT
- Urine analysis

Practical's:

- Simple Color reactions of Carbohydrates and Proteins
- Qualitative estimations of Glucose, Urea, Creatinine, Total Protein and Cholesterol
- Normal constituents of Urine
- Abnormal (pathological) Urine
- Glucose Tolerance Test and its significance
- Demonstration of Electrophoresis and Interpretation of important clinical conditions based on Electrophoresis appearance
- Demonstration of Paper Chromatography and its utility in the diagnosis of inborn errors of metabolism.

Reference Books:

1. Vasudevan (DM), Text Book of Biochemistry for Medical Students, Jaypee Pub,9th Edi, 2019.
2. Wilson & Walkers Principles & Techniques of Biochemistry & Molecular Biology, University Press, 8th Edi, 2018.
3. Harbans Lal and Rajesh Pandey Textbook of biochemistry, CBS, 3rd Edi, 2017
4. Harold Varley, Practical Clinical Biochemistry, CBS, 4th Edi, 2010.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

COMMUNICATION AND SOFT SKILLS
Course Code: BOTAT-C01

Placement: Ist Year (Ist Semester) **Time:** Theory: 60 Hours

Course Description: The course is designed to enable students to enhance their ability to speak and write the language (and use English) required for effective communication in their professional work. Students will practice their skills in verbal and written English during clinical and classroom experience.

UNIT - I (10 Hrs)

Review of Grammar

- Remedial study of Grammar
- Building Vocabulary
- Phonetics
- Public Speaking

UNIT - II (3 Hrs)

Communication

- What is communication?
- What are communication roles of listeners, speakers, readers and writers as health care professionals?

UNIT- III (5 Hrs)

Introduction to LSRGW

- L–Listening: Different types of listening
- S–Speaking: Understanding Consonants, Vowels, Word and Sentence Stress, Intonation
- R–Reading: Medical vocabulary
- Gr–Grammar: Understanding tenses, linkers
- W–Writing simple sentences and short paragraphs –emphasis on correct grammar

UNIT- IV (7 Hrs)

Attentive Listening

- Focusing on listening in different situations, announcements, descriptions, narratives ,instructions, discussions, demonstrations
- Reproducing Verbatim
- Listening to academic talks/lectures
- Listening to presentation

UNIT – V (12Hrs)

Effective Conversation

- Conversation situations–informal ,formal and neutral
- Factors influencing way of speaking–setting ,topic, social relationship ,attitude and language
- Greetings,introductions,requesting,askingforandgivingpermission,speakingpersonallyandcasualconversations
- Asking for information, giving instructions and directions

- Agreeing and disagreeing ,giving opinions
- Describingpeople,places,eventsandthings,narrating,reporting&reachingconclusions
- Evaluating and comparing
- Complaints and suggestions
- Telephone conversations
- Delivering presentation

UNIT-VI (8 Hrs)

Reading

- Reading strategies ,reading notes and messages
- Reading relevant articles and news items
- Vocabulary for everyday activities ,abbreviations and medical vocabulary
- Understanding visuals ,graphs, figures and notes on instructions
- Reading reports and interpreting them
- Using idioms and phrases, spotting errors, vocabulary for presentations
- Remedial Grammar

UNIT- VII (7 Hrs)

Writing Skills

- Writing patient history
- Note taking
- Summarizing
- Anecdotal records
- Letter writing
- Diary/Journal writing
- Report writing
- Paper writing skills
- Abstract writing

UNIT VIII (8 Hrs)

LSRW Skills

- Critical thinking strategies for listening and reading
- Oral reports ,presentations
- Writing instructions, letters and reports
- Error analysis regarding LSRW

Reference Books:

1. Clement, I,Essentials of English for Paramedical Courses, EMMESS,2nd Edi,2018.
2. LakshminarayananK.R.,EnglishforTechnicalCommunication,Scitechpublication, 2nd Edi2015

4. APPLIED PATHOLOGY
Course Code: BOTAT-004

Placement: I Year (II Semester)

Time: Theory: 60 Hours
Practical: 30 Hours

Course Description:
The course is designed to understand pathology laboratory reports, the normal ranges of investigations, severity and specificity of disease conditions which will help to perform International Classification of diseases to clinical pertinence.

Course Outline

UNIT-I (3Hrs)
Basic Concepts in Cellular Adaption's

- Cell injury and Cell death
- Cellular response to stress and other stimuli
- Over view of Cell injury and Cell death

UNIT-II (5Hrs)
Basic Principles in Inflammatory Process

- General features including inflammatory mediators and Basic Mechanisms of disorders of Immunity, General features of the immune system, Disorders of the Immune System,
- Acute and Chronic inflammation

UNIT-III (5Hrs)
Infectious Diseases

- Infectious diseases, Bacterial Infections (Typhoid, Tuberculosis and Leprosy) Viral infections (HIV, HbSAg and Polio)
- Specific Examples of Fungal, Parasitic and Syphilis infections

UNIT-IV (3Hrs)
Neoplasia

- Neoplasia Nomenclature, Rudimentary aspects on Tumor growth and Metastasis
- Definition of Neoplasia, Differences between Benign and Malignant tumors
- Staging and Grading of Tumors (Basic Aspects), Oncogenes and Tumor Suppressor genes

UNIT-V (5Hrs)
Hematology

- Structure and functions of Formed elements
- Objective use of anticoagulants, Mechanisms of Hemostasis
- Tests to monitor Coagulation, Blood Grouping and Blood Bank (Basic aspects on Blood Components)
- Fixatives and Basic details in Cytology, Aspiration Cytology of Bone marrow
- Basic concepts in Anemia, Cellular aspects of Leukemia (Basic Concepts)

UNIT-VI (3Hrs)
Histopathology

- Use of Microscopes, Grossing and Mounting Techniques
- Processing of Biopsy specimen, Paraffin sections

UNIT-VII (3Hrs)
Biomedical Waste Management and Environmental Pathology

- Biomedical waste management from perspectives of Pathology
- Environment and Disease – Smoking hazards, Asbestosis and Silicosis & Occupational Exposure

UNIT-VIII (3Hrs)
Clinical Pathology

- Collection, transport, preservation and processing of Clinical Specimen
- Clinical Pathology of specialized Body Fluids (CSF), Synovial fluid, Pleural Fluid
- Urine Examination (Urinalysis)

UNIT-IX (20Hrs)
Overview of Systemic Pathology

- Rheumatic Heart Disease
- Lungs: Pneumonia, COPD, Asthma, ARDS
- Liver: Hepatitis, Cirrhosis
- Muscle: Myasthenia Gravis
- Brain: Meningitis, Aspergillosis, CNS Tumor – (Classification)

UNIT-X (10Hrs)
Practical Demonstration

- Demo of Coagulation Profile, Phlebotomy techniques Blood Grouping and Rh typing, Urine Routine, Hemogram, Fecal Examination Safety Precautions in Clinical Pathology

Practical's:

- Blood Grouping and Rh typing
- Urine Routine
- Hb, TLC, DLC
- Gross Specimens
- Slides

Reference Books:

1. Mohan (H), Textbook of Pathology, Jaypee Pub, 5th Edi, 2019.
2. Kumar, Robbins & Cotran Pathologic Basis of Disease, WB Saunders, 10th Edi, 2020.
3. Kawthalkar(S), Essentials of Clinical Pathology, Jaypee Brothers, 2nd edi, 2018.
4. Nayak (R), Essentials of Hematology & Clinical Pathology, Jaypee Brothers, 2nd Edi, 2017.
5. Sengupta, Synopsis of Clinical Pathology & Microbiology, CBS Pub, 8th Edi, 2017.

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

5. APPLIED MICROBIOLOGY
Course Code: BOTAT-005

Placement: I Year (II Semester)

Time: Theory: 60 Hours
Practical: 30 Hours

Course Description: The course is designed to assist students to acquire understanding of fundamentals of microbiology and identification of microorganisms. It also provides opportunities for practicing infection control measures in hospital setting.

Course Outline

UNIT-I (5Hrs)
Introduction:

- History of microbiology- (contribution of Louis Pasteur, Robert Koch, Joseph Lister, Edward Jenner, Alexander Fleming)
- Importance of Microbiology in clinical practice
- Microscope –Types & Uses

UNIT-II (5Hrs)
General Microbiology:

- Infection, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate
- Routes of infection and spread, endogenous and exogenous infections at reservoir of infections
- Antimicrobials: mode of action, interpretation of susceptibility tests, resistance spectrum of activity
- Staining techniques: Gram staining, Acid fast staining, Culture methods Laboratory diagnosis of infection

UNIT-III (10Hrs)
Sterilization & Disinfection:

- Definition of Asepsis, Sterilization and Disinfection Hospital Acquired infection
- Universal safety precautions and Biomedical waste Disposal & Management

UNIT-IV (10Hrs)
Immunology:

- Antigen- Antibody-reaction & application for Diagnosis
- Immune response- Normal / Abnormal, Innate Immunity & acquired immunity (Vaccination)
- Hyper sensitivity & auto-immunity, Serological tests, Immunoprophylaxis

UNIT-V (10Hrs)
Bacteriology:

- Morphology, Classification according to the Pathogenicity,
- Mode of Transmission, methods of prevention,
- Collection and transport of samples for laboratory diagnosis, Interpretation of laboratory reports
- Staphylococci, Streptococci, & Pneumococci Neisseria, Mycobacterium: Tuberculosis, M.Leprae, Enterobacteriaceae, Escherichia Coli, Salmonella, Corynebacterium, Vibrosis, V. Cholerae and other medically important Vibrio's, Campylobacters and Helicobacters

Pseudomonas, Mycoplasma, Rickettsiae, Chlamydia, Bacillus anthracis, Sporing & nonsporing anaerobes, Clostridium

UNIT-VI (10Hrs)

Virology:

- General Properties, Basic structure and broad Classification of Viruses.
- Pathogenesis and Pathology of viral infection (HIV, Hepatitis, Polio, Measles, Congenital viral infections, Rubella, CMV, Herpes)
- Immunity and Prophylaxis of viral Diseases, Principles of viral diseases
- List of commonly used antiviral agents

UNIT-VII (5Hrs)

Parasitology:

- Amoebiasis, Malaria, Filaria, Toxoplasma, cystisarcosis, Roundworm, Hookworm, & Echinococcus.

UNIT-VIII (5Hrs)

Mycology:

- General Properties of Fungi, Classification based on fungal infection Candidiasis, Cryptococcosis, Dermatophytosis, Mycetoma, Aspergillosis.

Practical's:

- Introduction & visit to microbiology lab + Morphology of bacteria + Identification of bacteria (Culture plates &Basic biochemical reactions)
- Gram stain,Acid fast Stain
- Spotters , Instruments, Culture media inoculated &uninoculated
- Applied Immunology (Bacterial) Serological tests – CRP, ASO, RPR, Widal Applied Immunology (Virology) Serological tests:HIV, HBsAg(Rapid Tests)
- Stool Examination for eggs + Parasitology specimens

Reference Books:

1. Ananthanarayanan (R), Textbook of Microbiology, Orient Longman Ltd.,10th Edi, 2017.
2. Mackie and McCartney Practical Medical Microbiology, Relx India Pvt ltd, 14th Edi, 2018.
3. Baveja CP, Textbook of Microbiology, APC, 6th edi, 2021.
4. Sriram Kumar (S), Textbook of Microbiology, All win Publication, 1st Edi, 2019

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

6. APPLIED PHARMACOLOGY
Course Code: BOTAT-006

Placement: I Year (II Semester)

Time: Theory: 60 Hours
Practical: 30 Hours

Course Description: This course is designed to enable students to acquire understanding of Pharmaco-dynamics, Pharmaco-kinetics, principles of therapeutics & possible implications.

COURSE OUTLINE

UNIT - I (5 Hrs)

Introduction to Pharmacology

- Definitions & Branches
- Nature & Sources of drugs
- Dosage Forms and Routes of drug administration
- Terminology used
- Classification, Abbreviations, Prescription
- Drug Calculation, Weights and Measures
- Pharmacodynamics: Actions, Drug Antagonism, Synergism, Tolerance, Receptors, Therapeutic, adverse, toxic effects, pharmaco vigilance
- Pharmacokinetics: Absorption, Bioavailability, Distribution, Metabolism, Interaction, Excretion
- Review-Principles of drug administration and treatment individualization , Factors affecting dose, route etc
- Indian Pharmacopoeia: Legal Issues, Drug Laws, Schedule Drugs • Rational Use of Drugs • Principles of Therapeutics

UNIT - II(3 Hrs)

Pharmacology of commonly used antiseptics and disinfectants

- Antiseptics and Disinfectants
- Composition, action, dosage, route, indications, contraindications, Drug interactions, side effects, adverse effects, toxicity

UNIT - III(4 Hrs)

Drugs acting on G.I system

- Pharmacology of commonly used drugs - Emetics and Antiemetics , Laxatives and Purgatives, -Antacids and anti-peptic ulcer drugs ,Anti diarrhoea ,Fluid and electrolyte therapy, Furazolidone, dicyclomine.
- Composition, action, dosage, route, indications, contraindications, drug interactions, side effects, adverse effects, toxicity

UNIT - IV(4 Hrs)

Drugs acting on respiratory system

- Pharmacology of commonly used - Anti-asthmatics - Bronchodilators (Salbutamol inhalers) - Decongestants - Expectorants, Antitussives and Mucolytics - Broncho-constrictors and Antihistamines

- Composition, action, dosage, route, indications, contraindications, drug Interactions, side effects, adverse effects, toxicity

UNIT - V(5 Hrs)

Drugs used in treatment of Cardiovascular system and blood disorders

- Hematinic in treatment of anemia
- Cholinergic and anti-cholinergic
- Adrenergic Drugs for CHF, anti-adrenergic & vasodilators
- Anti-anginal
- Antiarrhythmic
- Antihypertensive
- Coagulants & Anticoagulants • Antiplatelet & thrombolytic
- Hypolipidemics
- Plasma expanders & treatment of shock
- Drugs used to treat blood disorders
- Composition, action, dosage, route, indications, contraindications, drug Interactions, side effects, adverse effects, toxicity

UNIT - VI(4 Hrs)

Drugs used in treatment of endocrine system disorders

- Insulin & oral hypoglycemic agents
- Thyroid and anti-thyroid drugs
- Steroids, Corticosteroids, Anabolic steroids
- Calcitonin, parathormone, vit D3, calcium metabolism, Calcium salts

UNIT - VII(4 Hrs)

Drugs used in treatment of integumentary system

- Antihistaminic and antipruritic
- Topical applications for skin Benzyl benzoate, Gamma BHC, Clotrimazole, Miconazole, Silver Sulphadiazine (burns)
- Composition, action, dosage, route, indications, contraindications, drug interactions, side effects, adverse effects toxicity

UNIT - VIII(4 Hrs)

Drugs used in treatment of communicable diseases (common infections, infestations)

- General Principles for use of Antimicrobials
- Pharmacology of commonly used drugs: - Penicillin, Cephalosporin's, Aminoglycosides, Macrolide & broad-spectrum antibiotics, Sulfonamides, quinolones, Misc. antimicrobials
- Anaerobic infections
- Anti- tubercular drugs
- Anti-leprosy drugs
- Antimalarial
- Antiretroviral drugs
- Antiviral agents
- Anthelminthic, Anti scabies agents
- Antifungal agents
- Composition, action, dosage, route, indications, contraindications, Drug Interactions, side effects, adverse effects, toxicity.

UNIT - IX(3 Hrs)

Drugs used in disorders of ear, nose, throat & Eye

- Antihistaminic
- Topical applications for eye (Chloramphenicol, Gentamycin eye drops), ear (Soda glycerin ear drops, boric acid ear drops, spirit boric ear drops), nose and buccal cavity-chlorhexidine mouthwash
- Composition, action, dosage, route, indications, contraindications, drug Interactions, side effects, adverse effects, toxicity.

UNIT - X(3 Hrs)

Drugs used on urinary system

- Pharmacology of commonly used drugs Renin angiotensin system, Diuretics and antidiuretics Drugs toxic to kidney Urinary antiseptics Treatment of UTI – acidifiers and alkalinizers
- Composition, action, dosage, route, indications, contraindications, Drug Interactions, side effects, adverse effects, toxicity.

UNIT - XI (5 Hrs)

Drugs acting on nervous system

- Basis & applied pharmacology of commonly used drugs
- Analgesics and anaesthetics Analgesics - Non steroidal anti-inflammatory (NSAID) drugs Antipyretics Opioids & other l analgesics, General (techniques of GA, preanesthetic medication) & local anesthetics Gases: oxygen, nitrous oxide, carbon-dioxide & others
- Hypnotics and sedatives,Skeletal muscle relaxants,Anti-psychotics,Mood stabilizers Antidepressants , Anti-Anxiety Drugs , Anticonvulsants
- Drugs for neurodegenerative disorders & miscellaneous drugs , Stimulants, ethyl alcohol and treatment of methyl alcohol poisoning
- Composition, action, dosage, route, indications, contraindications, drug Interactions, side effects, adverse effects toxicity.

UNIT - XII (3 Hrs)

Drugs used for hormonal, disorders and supplementation, contraception and medical termination of pregnancy

- Estrogens and progesterone's
- Oral contraceptives and hormone replacement therapy
- Vaginal contraceptives
- Drugs for infertility and medical termination of pregnancy, Uterine stimulants and relaxants
- Composition, actions, dosage, route, indications, contraindications, drugs interactions, side effects, adverse, effects, adverse effects, toxicity.

UNIT - XIII (3 Hrs)

Drugs used for pregnant women during antenatal, labor and postnatal period

- Tetanus prophylaxis
- Iron and Vit K1 supplementation
- Oxytocin, Misoprostol
- Ergometrine
- Methyl prostaglandin F2-alpha
- Magnesium sulphate
- Calcium gluconate

UNIT - XIV (5 Hrs)

Miscellaneous

- Drugs used for de-addiction
- Drugs used in CPR and emergency-adrenaline, Chlorpheniramine, hydrocortisone, Dexamethasone • IV fluids & electrolytes replacement
- Common poisons, drugs used for treatment of poisoning Activated charcoal Ipecac Antidotes Anti-snake venom (ASV)
- Vitamins and minerals supplementation
- Vaccines & sera (Universal immunization program schedules)
- Anticancer drugs, Chemotherapeutic drugs commonly used
- Immuno-suppressants and Immunostimulants

UNIT - XV (4 Hrs)

Introduction to drugs used in alternative systems of medicine:

- Ayurveda, homeopathy, unani and siddha etc.
- Drugs used

Reference Books:

1. Padmaja Udaykumar,Text book of Medical Pharmacology, CBS , 7th Edition, 2022.
2. Sharma.H.L & Sharma.K.K, Principles of Pharmacology, Paras Medical, 3rd Edi, 2017.
3. Tripathi.KD, Essentials of Medical Pharmacology, Jaypee Brothers, 8th Edition, 2018.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

COMPUTER APPLICATION
Course Code: BOTAT-C02

Placement:I Year (IISemester) **Time:** Theory:30 Hours
Practical:30Hours(Lab)

Course Description:
The course is designed for student to acquire the knowledge, develop basic understanding, use of computer and its applications in clinical field.

UNIT- I (10 Hrs)
Introduction to Computer

- Concepts of computers
- Hardware and Software
- Trendsand Technology
- Applications of Computer

UNIT- II (10 Hrs)
Introduction to Disk Operating System (DOS)

- Windows(allversion)
- MS Word
- MSExcelwithPictorialPresentation
- MS-Access
- MS-PowerPoint

UNIT- III (5 Hrs)
Statisticalpackages

- Typesandtheirfeatures

UNIT- IV (5 Hrs)
HospitalManagementSystem

- Typesanduses
- Electronicpatientrecords

ReferenceBooks:

1. Bansal Surabhi, Computer Applications for Allied Health Sciences, AITBS, 1st Edi, 2022.
2. Priyanka Randhir, Computer for Paramedical,CBS, 1st Edi, 2020
3. Pooja Jain & Neelam Kumari, Introduction to Computer, S.Vikas & Co, 5th edi, 2019
4. Shah Y.I, Paradkar A.R et.al, Introduction to Biostatistics and Computer Science, Nirali Prakashan Pub, 16th Edi, 2019.

7. CSSD INCLUDING STERLIZATION
Course Code: BOTAT-007

Placement: II Year (III Semester)

Time: Theory: 60 Hours
Practical /Clinical: 210 Hours

Course description

To acquire knowledge about the functional flow of CSSD, understand the principles and types of sterilization and infection control practices followed in hospital.

UNIT I:

- Role of CSSD in health care delivery, planning and layout, decontamination: scientific principle and recommended practices, water quality and its impact in CSSD procedure, HAVC (heat, air, ventilation, cooling) system and its impact.

UNIT II:

- Principles of sterilization and disinfection.
- Methods of sterilization: Dry Sterilization, Wet sterilization, Gaseous sterilization, Chemical sterilization, Radiation sterilization, call back system in case of detection of failure

UNIT III:

- Packaging material – textiles, management of surgical linen, packaging materials-rigid containers, packaging selection and use, packaging shelf life, assembly of sets/linen, dressing materials and standardrecommendations

UNIT IV:

- Sterilization operation and techniques-Techniques of sterilization of rubber articles.(LMA, FOB, ETT, Laryngoscopes, Anaesthesia machines and circuits, Technique of sterilization of carbonized articles).Methods of disinfection, Boiling, Chemical disinfection.
- Hazards of sterilization.

UNIT V:

- Prevention of hazards of sterilization. Precautions to be taken during sterilization.
- Recent advances in the methods of sterilization –plasma and ozone sterilization.
- Steriliser validation.

PRACTICAL

- Cleaning equipment and instruments.
- Transport of soiled linen.
- Packaging for ETO/ plasma
- Packaging for autoclave
- Trouble shooting autoclave.
- Trouble shooting ETO
- Analysis of indicator strips.
- Using fire extinguisher
- Maintainance of registers in CSSD.

TEXT BOOKS/ REFERENCE BOOKS:

1. Manual of anaesthesia for OT technicians - Ahanatha pillai . S First edition
2. Short textbook anesthesia - Ajay yadav 6 th edition
3. Principles of anaesthesia equipment's – Yasodhanandhaariti

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

8. INTRODUCTION TO OPERATION THEATRE & ANESTHESIA TECHNIQUES
Course Code: BOTAT-008

Placement: II Year (III Semester)

Time: Theory: 60 Hours
Clinical:210 Hours

Course Description:
The Introduction to Operation Theatre &Anaesthesia Technology course provides students with foundational knowledge and practical skills necessary for supporting anaesthesia care teams. This course is designed to prepare students for a career as an anaesthesia technologist, focusing on the principles, practices, and equipment used in the administration of anaesthesia.

UNIT: I(15 Hrs)
Concept of operation theatres: layout and designs, walls, ceilings, floor, ceiling, lightning, ventilation, airflow, temperature and humidity, operating table, different zones of OT, washing, daily cleaning, fumigation and culture.

Medical gas and Cylinders: Color coding, Cylinder valves; pin index, Gas piping system, Recommendations for piping system, Cylinder pressure gauge, Pressure regulator, Flow meter assembly, Vapourizers - types, hazards, maintenance, filling and draining, Alarms & safety devices.

UNIT: II(15 Hrs)
Operating list: Facts to be taken into consideration when booking an operating list Particulars that should appear in operating list, common mistakes while planning an operating list and clinical urgency for placement of operating list, list out emergency and routine cases.

Registers and packs used in operation theatres: Operating register, specimen register ,stock register, cancellation register, condemn register, biomedical report register, death register and tonsillectomy pack, appendectomy pack and I&D Pack.

UNIT: III(15 Hrs)
Surgical Equipment: Sterile instruments: Management, packing Special equipments: sharp/semi sharp, microsurgical equipments, air powered equipments, lensed equipment, laparoscopic equipments, cautery machines, tourniquets and other common equipments. Washing, cleaning, and packing Operating machine, monitors used commonly, various positioning, and investigations normal values. Stock taking and intending Checking expiry of drugs Narcotic drug maintenance

UNIT:IV(15 Hrs)
Face Masks & Airway Laryngoscopes: Types, sizes, endotracheal tubes - Types, sizes, Cuff system, Fixing, removing and inflating cuff, checking tube position complications.

Monitoring : ECG Temperature, IBP,CVP,PA Pressure, LA Pressure, Sp02, INTRAOPERATIVE MANAGEMENT, Confirm the identification of the patient, Monitoring – minimumNoninvasive & Invasive monitoring, Induction - drugs used

Endotracheal intubation: Maintenance of anaesthesia, Positioning of the patient,Blood / fluid & electrolyte balance,Reversal from anaesthesia - drugs used,Transferring the patient,Recovery room – set up and things needed

Practicals:Principle Preparation and demonstration of components of Anaesthesia workstation

Instruments : Diathermy, Operating table,Suction apparatus, Nebulizer, Operating room lights, Fumigation machine

Surgical sets/packs : Caesarean set, Hysterectomy set,Laparoscopic instruments, Operating microscope, laser and lithotripsy

Registers: Carbolization register,Fumigation register,Biopsy register,Cancellation register Recovery room register,Adverse drug event register,Narcotic register

Surgical sets/packs: Lumbar puncture tray, Tracheostomy tray, Excision I& D set, Hernia set, Appendicectomy Set

TEXT BOOKS/ REFERENCE BOOKS:

1. Manual of anaesthesia for OT technicians - Ahanatha pillai . S First edition
2. Essentials of anaesthesiology 7 th edition - Arun kumar paul
3. Short textbook anesthesia - Ajay yadav 6 th edition
4. Clinical Anaesthesiology – 6 th edition Morgan
5. Principles of anaesthesia equipment's – Yasodhanandhaariti
6. Comparative pharmacology for anaesthetists- Vipindhama
7. Miller anaesthesia – 3 rd edition

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

QUALITY ASSURANCE & PATIENT SAFETY
BOTAT–C03

Placement: II Year (III Semester) **Time:** 30 Hours

Course Description

This course is designed to provide healthcare professionals with the knowledge and skills necessary to promote quality assurance and patient safety in health care settings. To apply quality improvement methodologies and implement patient safety initiatives.

UNIT: I (5 Hrs)
QUALITY ASSURANCE MANAGEMENT

- Concepts of Quality of Care Quality Improvement Approaches Standards and Norms
- Quality Improvement Tools
- Quality control & Quality Assurance

UNIT: IIUNIT (5 Hrs)

TOTAL QUALITY MANAGEMENT4 P'S

- Peoples commitment, process improvement, product in time, patients need satisfaction
- TQM cycle

UNIT: IIIUNIT (10 Hrs)
ACCREDITATION OF THEATRES AND ICU

- Introduction to NABH guidelines Introduction to JCI guidelines
- ISO standards
- Benchmarking in TQC

UNIT: IVUNIT: (10 Hrs)
PATIENT SAFETY: INFECTION PREVENTION AND CONTROL

- Universal precautions Barrier nursing
- Use of Personal protective equipment (PPE)
- Monitoring & controlling of cross infection (Protective devices)

TEXT BOOKS/ REFERENCE BOOKS:

1. Textbook of patient safety & clinical risk management- Springer 1 st edition
2. Handbook of heathcare quality & patient safety , 3 rd edition peter lachman

9. MEDICINE and NON-OPERATIVE ROOM RELATED ANESTHESIA
Course Code: BOTAT-009

Placement: II Year (IV Semester) Time: Theory: 60 Hours
Clinical: 210 Hours

Course description

The course is designed to assist students to acquire the knowledge about internal medicine and their by dealing with the prevention, diagnosis, and treatment of internal diseases.

To acquire knowledge about the anesthesia techniques practiced outside Operation Theater.

UNIT – 1(30 Hrs)
General Medicine

- Disorder of haemopoiesis - Anaemias - iron deficience anaemia,
- Infections diseases - Sepsis and septic stock, fever of unknown origin, infective endocarditis, infective of skin, muscle, soft tissue, infection control in hospital, diseases caused by bacteria, viruses, myobacterm, viruses, fungi and protozoa and helminthes, common secondary infection in HIV.
- Diseases of CVS - congenital RHD - Rheumatic fever, CAD, Peripheral vascular diseases.
- Respiratory system - asthma pneumonia
- Kidney & Urinary tract - acute renal failure, Glomerulonephritis, Haemodialysis, Transplant, Urinary tract infection
- Liver and biliary tract disease - Viral hepatitis, alcoholism
- Endocrinology and metabolism - Diabetes mellitus, Hyper - and hypothyroidism
- Pain Medicine

UNIT II: (5 Hrs)
Non –Operating Anesthesia

- Introduction and unique challenge
- Guidelines for non –operating room anaesthesia, Patient selection for procedure

UNIT III: (10 Hrs)
CT/MRI

- Indications radiology suite & monitor compatible
- Anesthetic procedures – techniques (including international drugs radiology)
- Post procedure management

UNIT IV: (5 Hrs)
Endoscopy

- Monitored anaesthesia care Anaesthesia for UGI scopyAnaesthesia for Colonoscopy Anaesthesia for ERCP
- Sedation score and discharge criteria

UNIT V: (5 Hrs)
CATH LAB

- Diagnostic procedures International procedures

UNIT VI: (5 Hrs)

Anaesthesia for ECT Psychotropic drugs

- Anaesthetic management of pediatric and psychotropic drugs
- Oncotherapy Anaesthesia Conscious sedation in dentistry

Practicals :

General Examination
Vitals Monitoring , BP,HR,RR,ECG,SPO2
Investigations – PFT,LFT,RFT,TFT
HIV, Urinary tract infections
Consent /types
Hospice care
Euthanasia

TEXT BOOKS/ REFERENCE BOOKS:

1. Davidson‘s Principles and Practice of Medicine - Stuart Ralston, Ian Penman – Elsevier - 23rd EDITION
2. Macleod‘s Clinical examination - J. Alastair Innes – Elsevier - 14th
3. Medical Pharmacology - Padmaja Uday Kumar – CBS - 5th Edition

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question - 2 X 10 = 20 marks
Short answer question - 7 X 5 = 35 marks
Very Short answer - 10 X 2 = 20 marks

10. INTRODUCTION TO BASIC SURGERY AND SURGICAL TECHNIQUES
Course Code: BOTAT–010

Placement: II Year (IV Semester) Time: Theory: 60 Hours
Clinical: 210 Hours

COURSE DESCRIPTION:
The course is designed to acquire knowledge about the basic surgical techniques practiced in operation theatre. Learn and practice the sterile techniques. Understand the basic surgical concepts related to anesthesia.

I. Introduction to Surgery & Surgical Techniques, Instruments (20 Hrs)
- Definition and scope of surgery
- Surgical specialties and subspecialties
- Surgical team and their roles
- Basic surgical techniques (e.g., suturing, knot-tying, dissection)
- Surgical instruments and their uses
- Suture materials and wound closure techniques

II. Preoperative and Postoperative Care (15 Hrs)
- Preoperative evaluation and preparation
- Postoperative care and management of complications Wound Management and Closure
- Principles of wound healing and management
- Wound closure techniques (e.g., suturing, stapling, skin grafting)

III. Surgical Emergencies and Trauma (15 Hrs)
- Management of surgical emergencies (e.g., bleeding, shock)
- Initial assessment and management of trauma patients

IV. Surgical Site Infections and Antimicrobial Therapy (10 Hrs)
- Prevention and management of surgical site infections
- Antimicrobial therapy

Practicals :

- Basic surgical techniques (e.g., suturing, knot-tying, dissection)
- Surgical instruments and their uses
- Suture materials and wound closure techniques
- Preoperative evaluation and preparation
- Wound closure techniques (e.g., suturing, stapling, skin grafting)
- Prevention and management of surgical site infections
- Antimicrobial therapy

TEXT BOOKS/ REFERENCE BOOKS:

1. Text book on operation theatre technology -B.C .Bhagavan 6 th edition
2. Manipal manual of surgery - K.Rajgopal shenoy

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

PHYSIOTHERAPY
Course Code: BOTAT–C04

Placement: II Year (IV Semester) Time: Theory: 30 Hours

Course Description:

Understand the principles and concepts of physiotherapy and its application in various settings. Develop skills in assessing, diagnosing, and managing patients with musculoskeletal, cardiovascular, respiratory, and neurological conditions. Learn various physiotherapeutic techniques, including exercise therapy, manual therapy, electrotherapy, and hydrotherapy.

UNIT- I (10 Hrs)

Chest Physiotherapy International Classification of Functioning, Disability and Health (ICF) Physical therapy principles- Manual therapy, exercise therapy, and electrotherapy, common therapies that promotes mobility and function. Assessment, Goals , Precautions, Techniques, Positioning, Postural drainage, Clapping, Chest tapotement, chest vibration, manual hyperinflation, coughing, breathing exercises, suctioning, Respiratory muscle training, manual hyperinflation, percussion, vibration, in-ex sufflation, percussive ventilation Prevention of the effects of bed-rest and improvement in the health status.

UNIT- II (5 Hrs)

Limb physiotherapy, mobilization, Mobilization & stimulation, role of continuous passive movements, passive & active assisted mobilization, continuous rotational therapy, postures, limbexercises for peripheral muscle training

UNIT- III (5 Hrs)

Critical illness Myopathy, physical deconditioning, measuresadopted to achieving good quality of life Recovery of physical and respiratory functions, impaired airway clearance, atelectasis, reintubation avoidance, coming off mechanical ventilation, weaning failure physiotherapy in ventilated patient

UNIT- IV (5 Hrs)

Physiotherapy done in bed ridden patients, whole bodyphysiotherapy, pediatric therapies, care of terminally ill Assessment tools.

UNIT- V (5 Hrs)

Criteria for mobilizing a patient, Home therapies,

TEXT BOOKS/ REFERENCE BOOKS:

1. Textbook of Physiotherapy Paperback – 3 March 2023 by Basanta Kumar Nanda
2. Physiotherapy In Orthopedic And Rheumatologic Conditions by Megha Sandeep Sheth

11. ANESTHESIA for ENT , OPHTHALMIC & ORTHO SURGERY
Course Code: BOTAT–011

Placement: III Year (V Semester) Time: Theory: 60 Hours
Clinical: 210 Hours

Course Description:

The course is designed to acquire knowledge about anesthesia for broad specialty surgeries. To ensure that the students understand the anesthesia techniques in its clinical practice.

UNIT I: Anesthesia for ENT Surgery (20 Hrs)

- EAR lobe surgery
- Adenotonsillectomy
- Mastoidectomy
- Bronchoscopy
- Esophagoscopy
- Post tonsillectomy bleeding
- FEES
- Cystoplasty
- Laryngectomy
- Tracheostomy
- Micro laryngeal excision

UNIT II: Anesthesia for Ophthalmic Surgery (20 Hrs)

- Ophthalmic nerve blocks
- Cataract surgery
- Ophthalmic injuries & emergencies
- Fundus fluorescein angiography
- Vitero retinal procedures sedation

UNIT III: Anesthesia for Ortho Surgery (20 Hrs)

- Anesthesia for joint replacement surgery
- Anesthesia for hemiarthroplasty
- Table positioning 7 patient positioning for specific surgery (ergonomics for ortho surgeries)
- Anesthesia fractures of dislocation
- Anesthesia for arthroscopic procedures
- Anesthesia for cervical spine
- Anesthesia for lumbar spine
- Anesthesia for thoracic spine
- Prone positioning Of anesthetic implications C-arm & ortho procedures

Practicals : General anesthesia equipments & procedures

- Bag mask ventilation
- Oropharyngeal airway
- Nasopharyngeal airway
- AMBU bag
- Endotracheal tube
- Laryngoscope with blade

- Magill's forceps
- Guedels airway
- Stylet
- Boogie
- Ryles tube
- Nasal prongs
- O2 mask
- Suction catheter
- Reversal extubation procedure
- Nasal intubation procedure

TEXT BOOKS/ REFERENCE BOOKS:

1. Manual of anesthesia for OT technicians - Ahnandha pillai
2. Short textbook of anesthesia - Arun kumar paul
3. short textbook anesthesia - Ajay yadav
4. Clinical Anesthesiology – 6 th edition Morgan
5. Principles of anesthesia equipment's – Yasodhanandha ariti
6. Comparative pharmacology for anesthetists- Vipin dhama

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

12. ANESTHESIA for OG & PEDIATRICS SURGERY
Course Code: BOTAT – 012

Placement: III Year (V Semester) Time: Theory: 60 Hours
Clinical: 210 Hours

Course Description:

The course is designed to acquire knowledge about clinical anesthesia of obstetrics, gynecological and general surgery. To ensure that the students understand the anesthesia techniques in its clinical practice.

UNIT I: OBG (30 Hrs)

- Anesthesia For Normal Pregnancy
- Anesthesia for Pregnancy induced hypertension/ cardiac diseases
- Diabetic complicating pregnancy
- Anemia complicating pregnancy
- Anesthesia for Anti-partum hemorrhage
- Anesthesia for post-partum haemorrhage
- Uterine inversion
- Retention of placenta
- Ectopic pregnancy
- Laparoscopic gynecological procedures
- D&C
- Hysteroscopy procedures
- Hysterectomy – Abdominal, laparoscopic, Vaginal

UNIT II: PAEDIATRIC ANAESTHESIA (30 Hrs)

- Theatre setting
- Check list
- Premedication - modes
- Induction Intubation - Securing the EIT
- Reversal & extubation – Problems
- Transferring / ICU management
- Pain management

Practicals: ANESTHESIA for OG & PEDIATRICS SURGERY

- Theatre setting
- Check list
- Premedication - modes
- Induction Intubation - Securing the EIT
- Reversal & extubation – Problems
- Transferring / ICU management
- Pain management
- Anesthesia For Normal Pregnancy
- Laparoscopic gynecological procedures

TEXT BOOKS/ REFERENCE BOOKS:

1. Manual of anaesthesia for OT technicians - Ahnandha pillai
2. Short textbook of anaesthesia - Arun kumar paul
3. short textbook anesthesia - Ajay yadav
4. Clinical Anesthesiology – 6 th edition Morgan
5. Principles of anesthesia equipment's – Yasodhanandha ariti
6. Comparative pharmacology for anesthetists- Vipin dhama

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

BIOSTATISTICS & RESEARCH METHODOLOGY

Course Code: BOTAT –C05

Placement:III Year (V Semester) **Time:** Theory: 30 Hours

Course Description: At the end of the course, the students will be able understand the statistical methods and apply them in conducting research studies.

UNIT- I (5 Hrs)

Introduction:

- Concepts,types,significanceandscopeofstatistics,Meaningofdata,Sample,parameter
- Type and levels of data and their measurement
- Organization and presentation of data–Tabulation of data; Frequency distribution–Graphical and tabular presentations

UNIT- II(5 Hrs)

Measures of central tendency:

- Mean, Median, Mode

Measures of variability:

- Range,Percentiles,averagedeviation,quartiledeviation,standarddeviation

Normal Distribution:

- Probability,
- Characteristics and application of normal probability curve;
- Sampling

UNIT- III (5 Hrs)

Measures of relationship:

- Correlation–need and meaning
- Rank order correlation
- Scatter diagram method
- Product moment correlation
- Simple linear regression analysis and prediction.

UNIT-IV(5 Hrs)

Significance of Statistic and Significance o fdifference between two statistics(Testing hypothesis)

- Non parametric test – Chi-square test, Sign, median test, Mann Whitneytest.
- Parametric test–'t'test, ANOVA,MANOVA,ANCOVA

UNIT- V(5 Hrs)

Research Methods:

- Research Meaning-
- Scope and Objectives
- Research methods vs.Methodology.

Types of research

- Descriptive vs.Analytical
- Applied vs.Fundamental
- Quantitative vs. Qualitative
- Conceptual vs. Empirical

Concept of applied and basic research process,

- Defining and formulating the research problem
- Selecting the problem,necessity of defining the problem,
- Importance of literature review in defining a problem,
- Criteria of good research.

Literature review

- Primary and secondary sources,
- Reviews, monograph, patents,
- Research databases, web as source, searching the web,
- Critical literature review,
- Identifying gap areas from literature and research database ,development of working hypothesis

UNIT- VI(5 Hrs)

Data Collection and Sampling:

- Data collection
- Classification of data
- Class intervals
- Continuous and discrete measurements
- Drawing of frequency polygon
- Types of frequency polygon
- Histogram
- Accepts of method validation, observation and collection of data, methodsofdatacollection

Sampling methods,

Data processing and analysiss trategies and tools,data analysis with statistical package

- Sigma STAT,SPSS for studentt-test, ANOVA,etc.
- Hypothesis testing.

Correlation

- Historicalcontribution
- Meaningofcorrelation
- Types:Product,moment,contentcorrelation,variationofproduct,movementcorrelation,rankcorr elation,

Regression analysis.

- Tests of significance-needfor
- sampling error
- significance of the mean
- significance of differences between means
- Interpretation of probability levels–small samples–large samples.

Reference Books:

1. MahajanB.K.,Methods in Biostatistics fo rMedical Students and Research Workers,Jaypee,9th Edi,2018.
2. SundarRao&Richard,Introduction to Biostatistics&Research Methods, Prentice Hall of India,NewDelhi,5thedition,2012.
3. NegiK.S.,Biostatistics, A.I.I.B.S,1stEdi,2013.
4. Rao&Murthy,Applied Statistics in Health Sciences, J.B.Brothers,NewDelhi2010.
5. VisweswaraRao,Biostatistics&ManualofStatisticalMethodsforuseinHealth,Nutrition and Anthropology,J.B.BrothersPublishers Pvt.Ltd.,2009.

13. ANESTHESIA for SUPERSPECIALITY –URO SURGERY, NEUROSURGERY, CARDIOTHORACIC SURGERY

Course Code: BOTAT-013

Placement: III Year (VI Semester) Time: Theory: 60 Hours
Clinical: 210 Hours

Course Description:

The course is designed to acquire knowledge about clinical anesthesia of Neuro and cardiothoracic surgery. To ensure that the students understand the anesthesia techniques in its clinical practice.

Unit-I : CARDIAC – THORACIC ANAESTHESIA (30 Hrs)

- NYHA classification , Arrhythmias ,
- Induction of cardiac patient, precautions to be taken , Cardiopulmonary bypass , Weaning of CPB , Transferring the
- Patient to ICU. Care to be taken, I.C.U management. , Chest tube management
- Pulmonary function tests, bed side ,Vitallograph , Preoperative preparation , Premedication , Check list ,Induction, Intubation
- ,Double lumen tubes ,monitoring , Pain management , Extubation, ICU management
- NEURO ANAESTHESIA UNIT-I
- Glasgow coma scale , Premedication ,Special investigation - CT, Angiography and MRI , Checklist

UNIT-II : NEUROSURGERY ANAESTHESIA (20 Hrs)

- Induction of a patient ,Reinforced Endotracheal tubes , Postioning in neuro surgery , I.C.P. Air embolism , Reversal of the patient
- Transferring to I.C.U. / Ward

UNIT – III UROSURGERY ANAESTHESIA (10 Hrs)

- Anesthesia for Uro-surgeries including TURP

Practicals :

HME filter, IV set, Foleys catheter, Uro bag, LMA- All generation, Blood transfusion set
IGEL, Humidifier, Tracheostomy tube-Carboprost-IV fluids, Crystalloids, Saline –RL,NS, DNS, Plasmalyte, Colloids,Natural - plasma, albumin,Artificial – Dextran – 60%,40%,70%
HES, Gelatin 4%, Special fluids – 3% NaCl, KCl, Calcium gluconate,NAHCO3

TEXTBOOKS/ REFERENCE BOOKS

1. Manual of anaesthesia for OT technicians - Ahnandha pillai
2. Short textbook of anaesthesia - Arun kumar paul
3. short textbook anesthesia - Ajay yadav
4. Clinical Anesthesiology – 6 th edition Morgan
5. Principles of anesthesia equipment's – Yasodhanandha ariti
6. Comparative pharmacology for anesthetists- Vipin dhama
7. Miller anesthesia

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

14. ANESTHESIA for TRANSPLANT & TRUMA MANAGEMENT

Course Code: BOTAT–014

Placement: III Year (VI Semester) Time: Theory: 60 Hours
Clinical: 210 Hours

Course Description:

The course is designed to acquire knowledge about clinical anesthesia of Transplant surgery and Truma management. To ensure that the students understand the anesthesia techniques in its clinical practice.

UNIT- 1 Anaesthesia for transplant (30 Hrs)

- ORGAN HARVESTING & DONOR
- Types of donor
- Diagnosis of brain death
- Pre organ harvesting donor care
- Etiology of liver injury
- Hepatology assessment & general case
- Etiology of kidney injury
- Candidates for renal transplantation – donor, recipient
- Anesthesia for renal transplantation – donor, live and cadaver
- Indication of cardiac transplantation
- Pathophysiology of heart diseases
- Anesthesia for transplant recipient
- Indication for lung transplant
- Anesthesia for organ donor
- Post-transplant care
- Anesthesia for liver transplant – donor recipient
- Transfusion & fluid manage- intra operative , post-operative
- Post-operative care for complications

UNIT II: TRUMA MANAGEMENT (30 Hrs)

- Type of trauma and classification, Triage,ATLS(Acute trauma life support)
- Urgent interventions in acute trauma care- Introduction
- Blood investigations including hemoglobin, blood grouping, typing and cross matching, serology. Other blood investigations include RFT, Serum electrolytes, LFT.
- Chest X-ray, patient positioning, X-ray of suspected long bone fractures.
- FAST scan – Four quadrant abdominal scan, lungs scan, Emergency bedside transthoracic ECHO, ECG,CT Scan- Shifting, positioning.
- Common emergency procedures: ICD Insertion- Site, positioning, preparation, Equipment's.
- Tracheostomy-Indications, Technique, Positioning, Requirements
- Stomach wash- Indications, Techniques and drugs used.
- SPC Insertion- Indications and Techniques.
- Medico legal issues, certification of death.

Practicals:

- Drugs &Vaporizer Dopamine/Dobutamine/Vasopressin/Adenosine/Isoprenaline/Noradrenaline/NTG/Antiarrhythmic/Sevoflurane/Isoflurane/Enflurane/Halothane/ Desflurane/Vaporizer model /Mounting, Filling TEC 1-5/7
- Tec6 / Heparin/Protamine
- Life support
- BLS, ACLS, ATLS, RSI, PALS

TEXTBOOKS/ REFERENCE BOOKS

1. Manual of anaesthesia for OT technicians - Ahnandha pillai
2. Short textbook of anaesthesia - Arun kumar paul
3. short textbook anesthesia - Ajay yadav
4. Clinical Anesthesiology – 6 th edition Morgan
5. Principles of anesthesia equipment's – Yasodhanandha ariti
6. Comparative pharmacology for anesthetists- Vipin dhama
7. Miller anesthesia

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

MEDICAL LAW & ETHICS & PRACTICE MANAGEMENT
Course Code: BOTAT -C06

Placement:III Year (VI Semester) **Time:** Theory: 30Hours

Course Description: The Course is designed to understand the basics of Medical Law and Ethics in relation to clinical science.

UNIT- I(5 Hrs)
Introduction to Ethics

- what is ethics
- what are values and norms
- Hippocratic oath

UNIT- II(15 Hrs)
Ethics of individual

- Doctor patient relationship.
- Right to be respected.
- Truth and confidentiality
- Autonomy of decision
- The patient as a person

UNIT- III(10Hrs)
Professional Ethics

- Codeofconduct
- Malpracticeandnegligence.
- Contractandconfidentiality.

Reference Books:

1. Erich H Loewy, Text book of Medical Ethics, Springer publications, 1st edition, 2014.
2. Shaun.D.Pattinson, Medical Laws and Ethics, Sweet and Maxwell, 5th Edition, 2015.
3. Princy Louis Palatty et.al - A Textbook of Bioethics for Healthcare Professionals, 1st Edi, 2018

VIII. Question Paper Pattern

(Subject with Theory and Practical Exam)

Guidelines for setting a Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Time: 3 hours Max Marks: 80

Pattern of Question Paper

I. Write essay on **any TWO** (2x 10 =20 marks)

1.
2.
3.

II. Write short notes on **any EIGHT**(8 x 5 =40 marks)

4.
5.
6.
7.
8.
9.
10.
11.
12.
13.

III. Very Short Answer – Answer **all questions**: (10 x 2 = 20 marks)

14.
15.
16.
17.
18.
19.
20.
21.
22.
23.

VIII. Question Paper Pattern

(Subject with only Theory Exam and no Practical Exam)

Guidelines for setting a Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Time: 3 hours Max Marks: 75

Pattern of Question Paper

I. Write essay on **any TWO** (2x 10 =20 marks)

1.
2.
3.

II. Write short notes on **any SEVEN** (7 x 5 =35 marks)

4.
5.
6.
7.
8.
9.
10.
11.
12.

III. Very Short Answer – Answer **all questions**: (10 x 2 = 20 marks)

13.
14.
15
16.
17.
18.
19.
20.
21.
22.