DEPARTMENT OF OPERATION THEATRE AND ANESTHESIA TECHNOLOGY

Study scheme & syllabi

As per choice based credit system (CBCS)
For
B.Sc. in Operation Theatre and Anesthesia Technology
(B.Sc. OTAT)

(First to sixth semester)

(Program Code: OTAT-301)

FROM 2021-2022

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Section 1

Vision and Mission of the University

VISION

To become one of the most preferred learning places a centre of excellence to promote and nurture future leaders who would facilitate in desired change in the society

MISSION

- To impart teaching and learning through cutting edge technologies supported by the world class infrastructure
- To empower and transform young minds into capable leaders and responsible citizens of India instilled with high ethical and moral values
- To develop human potential to its fullest extent and make them emerge as world class leaders in their professions and enthuse them towards their social responsibilities

Section 2

Vision and Mission of the Department

VISION

To provide the highest quality care and safety for patients undergoing surgery and other procedures that require anesthesia. This department plays a critical role in ensuring that patients receive optimal care during their surgical experience, from preoperative assessment and preparation to intraoperative management and postoperative recovery.

In order to achieve this vision, the operation theatre and anesthesia technology department must stay up-to-date with the latest technologies and techniques in surgical and anesthesia care. This includes maintaining state-of-the-art equipment and facilities, as well as investing in ongoing training and education for staff.

The department also has a responsibility to collaborate with other healthcare professionals, including surgeons, nurses, and other support staff, to ensure that all aspects of patient care are coordinated and integrated. This includes providing expert guidance and consultation to help optimize patient outcomes and ensure that all aspects of the surgical experience are managed effectively.

MISSION.

The mission of the Operation Theatre and Anesthesia Technology Department is to provide specialized support and expertise in the administration of anesthesia and the maintenance of equipment and supplies necessary for surgical procedures.

This department plays a critical role in ensuring that patients undergoing surgery are safe and comfortable throughout the surgical process. They work closely with the surgical team, including surgeons, nurses, and other healthcare professionals, to ensure that all necessary equipment and supplies are available and functioning properly.

The department is responsible for the preparation and maintenance of the operation theatre, including the sterilization of instruments and equipment, the preparation of medications and solutions, and the maintenance of a clean and sterile environment. Anesthesia technologists assist anesthesiologists in administering anesthesia to patients before, during, and after surgery.

Section 3

ABOUT THE PROGRAM

ABOUT THE PROGRAM

The B.Sc. Operation Theatre and Anesthesia Technology is a three-year (Academic) and 06 Months (Clinical Internship) undergraduate program that focuses on training students to become skilled operation theatre technicians and anesthesia technologists.

The curriculum includes theoretical and practical knowledge of anatomy, physiology, pharmacology, anesthesia, surgical procedures, infection control, and medical ethics. Students will also learn about the operation theatre equipment and its maintenance, patient monitoring, and emergency management.

Upon graduation, students can work in hospitals, clinics, and other healthcare facilities as operation theatre technicians, anesthesia technologists, surgical assistants, or sterile processing technicians. They can also pursue higher education and research in the field of anesthesia and surgical technology.

To pursue this course, candidates must have passed their 10+2 examination in the science stream with a minimum of 50% marks. Admission to the program is usually based on merit or entrance exams conducted by universities or colleges.

After completing the B.Sc. Operation Theatre and Anesthesia Technology course, further students can opt for the course of Anesthetist Consultant. An Anesthetist Consultant is responsible to give the right amount of anesthesia dosage with accurate levels. Students can go for various M.Sc. courses as well.

Section 4

Program Education Objectives (PEOs), Program Outcomes (Pos) and Program Specific Outcomes (PSOs)

Program Education Objectives

PEO1	Professional Competence: Graduates should possess the necessary knowledge and skills required to perform clinical procedures in operation theatre and anesthesia technology efficiently and effectively.
PEO2	Critical Thinking and Problem Solving: Graduates will be able to identify, analyze, and solve problems related to Operation Theatre and Anesthesia Technology using critical thinking skills and evidence-based practices.
PEO3	Leadership and Management: Graduates will be prepared to assume leadership and management roles in healthcare organizations and be able to effectively manage resources and personnel
PEO4	Ethical and Professional Behavior: Graduates will demonstrate ethical and professional behavior in their interactions with patients, colleagues, and other healthcare professionals.

PROGRAM OUTCOMES

PO 1	**Demonstration-** Demonstrate basic knowledge of pathophysiology of common conditions requiring surgical procedures
PO 2	**Preparation-** Prepare the operation theatre, load and label requested drugs, gather and assemble the surgical equipment for common surgical procedures as per the complexity and duration.
PO 3	**Recognize-** Recognize the anxiety of patients in peri-operative state and appropriately assist to shift, induce anaesthesia and position patient for surgical procedure
PO 4	**Identify**- Recognize the anxiety of patients in peri-operative state and appropriately assist to shift, induce anaesthesia and position patient for surgical procedure
PO 5	**Assistance-** Assist consultant in emergency department while receiving acutely ill patients, stabilize them and transport in or out of hospital as per the individual needs.
PO 6	**Work as a team member** – Function as a member of rescue / code blue team in recognizing cardiac arrest and participate in revival cum cardiopulmonary resuscitation inside and outside hospital.
PO 7	**Management-** Manage the overall upkeep of the equipment used in intensive care unit and transport of critically ill patients and assist the specialist in resuscitation, management and transfer of such patients with appropriate paraphernalia.
PO 8	**Contribution-** Contribute in planning, setting up, commissioning, maintaining and managing operation theater, emergency departments, and intensive care unit, cardiac catheterization lab and emergency response services as a team member
PO 9	**Self Assessment-** Engage oneself in self-assessment and structure their continuing professional education to refine existing skills and acquire new skills for patient care and professional advancement.
PO 10	**Apply-** Understand the fundamentals and applications of Anesthesia, Surgical & Critical Care Equipments.
PO 11	**Learning-** Learn and Understand different Anesthetic & Surgical Procedures & their benefits as well as complications.
PO 12	**Analyse-** Ability to analyse, Monitor & give care to a Surgical/Anaesthetized patient.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1	Knowledge of anatomy and physiology: Students should have a deep understanding of the human body and how it functions, particularly in relation to the respiratory and circulatory systems.
PSO 2	Knowledge of surgical and anesthesia equipment: Students should be familiar with the various instruments and machines used in the operation theatre, as well as the different types of anesthesia and how to administer them safely.
PSO 3	Patient care: Students should be able to provide appropriate care to patients before, during, and after surgery, including monitoring vital signs and administering medications as needed.

Section 5

Curriculum / Scheme with Examination Grading Scheme

SEMESTER WISE SUMMARY OF THE PROGRAM: B.Sc. OTAT

S. no.	Semester	No. of Contact hours	Marks	Credits
1	I	35	900	27
2	II	37	900	29
3	III	29	700	23
4	IV	37	800	25
5	V	24	800	20
6	VI	24	800	20
	TOTAL	**186**	**4900**	**144**

EXAMINATION GRADING SCHEME

Percentage of marks obtained	Letter Grade	Grade Point	Performance
90.00 – 100	O	10	Outstanding
80.00 – 89.99	A	9	Excellent
70.00 – 79.99	B	8	Good
60.00 – 69.99	C	7	Fair
50.00 – 59.99	D	6	Average
Less Than 50	F	0	Fail
Absent	AB	0	Fail

Percentage Calculation: CGPA*10

BOTAT, 1st SEMESTER:

Subject			**Contact Hours/Week**			**Credit**	**Evaluation Scheme (% of Total Marks)**				
Category	GE-101	**Title**	**L**	**T**	**P**		**CWA**	**LWA**	**MTE**	**ETE**	**Total**
PC	BOTAT-1101	General English	2	1		3	16		24	60	100
PC	BOTAT-1102	Anatomy and Physiology	3	1		4	16	---	24	60	100
PC	BOTAT-1103	Central Sterile Services (CSSD) Procedures	3	1		4	16	---	24	60	100
PC	BOTAT-1104	Basic Hematology	3	1		4	16	---	24	60	100
PC	BOTAT-1105	Conceptual Microbiology and Biochemistry	3	1		4	16	---	24	60	100
PC	BOTAT-1106	Anatomy and physiology (practical)			4	2		40		60	100
PC	BOTAT-1107	Central Sterile Services (CSSD) Procedures (Practical)			4	2	---	40		60	100
PC	BOTAT-1108	Basic Hematology (Practical)			4	2		40		60	100
PC	BOTAT-1109	Conceptual Microbiology and Biochemistry (Practical)			4	2	----	40		60	100
Total			**14**	**05**	**16**	**27**	**80**	**160**	**120**	**480**	**900**

Program Name: B.Sc. Operation Theatre and Anesthesia Technology
Program Code: OTAT-301

BOTAT, 2nd SEMESTER

Subject			Contact Hours/Week			Credit	Evaluation Scheme (% of Total Marks)					Exam Duration (Hours)
Category	Code	Title	L	T	P		CWA	LWA	MTE	ETE	Total	
PC	GE-201	General English	2	1		3	16		24	60	100	
PC	BOTAT-1201	Anatomy and physiology	3	1		4	16	---	24	60	100	
PC	BOTAT-1202	Applied Pathology	4	1		5	16	---	24	60	100	
PC	BOTAT-1203	Surgical Instruments and Monitoring	3	1		4	16	---	24	60	100	
PC	BOTAT-1204	Anaesthesia Equipment and Technology	4	1		5	16	---	24	60	100	
PC	BOTAT-1205	Anatomy and physiology (Practical)			4	2		40		60	100	
PC	BOTAT-1206	Applied Pathology (Practical)			4	2	---	40		60	100	
PC	BOTAT-1207	Surgical Instruments and Monitoring (Practical)			4	2		40		60	100	
PC	BOTAT-1208	Anaesthesia Equipments and Technology (Practical)			4	2	---	40		60	100	
Total			**16**	**05**	**16**	**29**	**80**	160	**120**	**480**	**900**	

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BOTAT, 3rd SEMESTER

Subject			Contact Hours/Week			Credit	Evaluation Scheme (% of Total Marks)					Exam Duration (Hours)
Category	Code	Title	L	T	P		CWA	LWA	MTE	ETE	Total	
PC	BOTAT-2301	Applied Pharmacology-I	3	1		4	16	---	24	60	100	
PC	BOTAT-2302	Introduction to Operation theatre and Anaesthesia Technology	4	1		5	16	---	24	60	100	
PC	BOTAT-2303	Introduction to Obstetrics and Gynecology	3	1		4	16	---	24	60	100	
PC	BOTAT-2304	Applied Pharmacology-I (Practical)			4	2		40		60	100	
PC	BOTAT-2305	Introduction to Operation theatre and Anaesthesia Technology (Practical)			4	2		40		60	100	
PC	BOTAT-2306	Introduction to Obstetrics and Gynecology (Practical)			4	2		40		60	100	
PE	Program Elective-I		4			4	16	---	24	60	100	
Total			**14**	**3**	**12**	**23**	**64**	**120**	**96**	**420**	**700**	

	Course Code	Course Title
Program Elective-I	BOTAT-2307	Human Values and Professional Ethics
	BOTAT-2308	Sociology

Program Name: B.Sc. Operation Theatre and Anesthesia Technology
Program Code: OTAT-301

BOTAT, 4th SEMESTER

Subject			Contact Hours/Week			Credit	Evaluation Scheme (% of Total Marks)					Exam Duration (Hours)
Category	Code	Title	L	T	P		CWA	LWA	MTE	ETE	Total	
PC	BOTAT-2401	Applied Pharmacology-II	3	1		4	16	---	24	60	100	
PC	BOTAT-2402	Anaesthesia Techniques and Complications	4	1		5	16	---	24	60	100	
PC	BOTAT-2403	Medicine Relevant to Operation Theatre and Anaesthesia Technology	3	1		4	16	---	24	60	100	
PC	BOTAT-2404	Biostatistics and Computer Applications	3	1		4	16	---	24	60	100	
PC	BOTAT-2405	Applied Pharmacology-II (Practical)			4	2		40		60	100	
PC	BOTAT-2406	Anaesthesia Techniques and Complications (Practical)			4	2		40		60	100	
PC	BOTAT-2407	Medicine Relevant to Operation Theatre and Anaesthesia Technology (Practical)			4	2		40		60	100	
PC	BOTAT-2408	Biostatistics and Computer Applications (Practical)			4	2	---	40		60	100	
Total			**12**	**04**	**16**	**25**	**64**	**160**	**96**	**480**	**800**	

BOTAT, 5th SEMESTER

Subject			Contact Hours/Week			Credit	Evaluation Scheme (% of Total Marks)					Exam Duration (Hours)
Category	Code	Title	L	T	P		CWA	LWA	MTE	ETE	Total	
PC	BOTAT-3501	Anesthesia Technology-I	3	1		4	16	---	24	60	100	
PC	BOTAT-3502	Surgical Procedures-I	3	1		4	16	---	24	60	100	
PC	BOTAT-3503	Anesthesia for Speciality Surgeries	3	1		4	16	---	24	60	100	
PC	BOTAT-3504	Basic Intensive care and Resuscitation	3	1		4	16	---	24	60	100	
PC	BOTAT-3505	Anesthesia Technology-I (Practical)			2	1		40		60	100	
PC	BOTAT-3506	Surgical Procedures-I (Practical)			2	1		40		60	100	
PC	BOTAT-3507	Anesthesia for Speciality Surgeries (Practical)			2	1		40		60	100	
PC	BOTAT-3508	Basic Intensive care and Resuscitation (practical)			2	1	---	40		60	100	
Total			**12**	**4**	**8**	**20**	**64**	**160**	**96**	**480**	**800**	

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BOTAT, 6th SEMESTER

Subject			Contact Hours/Week			Credit	Evaluation Scheme (% of Total Marks)					Exam Duration (Hours)
Category	Code	Title	L	T	P		CWA	LWA	MTE	ETE	Total	
PC	BOTAT-3601	Anesthesia Technology-II	3	1		4	16	---	24	60	100	
PC	BOTAT-3602	Surgical Procedures-II	3	1		4	16	---	24	60	100	
PC	BOTAT-3603	Specialized Surgical Techniques	3	1		4	16	---	24	60	100	
PC	BOTAT-3604	Advanced Anesthesia Technology	3	1		4	16	---	24	60	100	
PC	BOTAT-3605	Anesthesia Technology-II (Practical)			2	1		40		60	100	
PC	BOTAT-3606	Surgical Procedures-II (Practical)			2	1		40		60	100	
PC	BOTAT-3607	Specialized Surgical Techniques (Practical)			2	1		40		60	100	
PC	BOTAT-3608	Advanced Anesthesia Technology (practical)			2	1	---	40		60	100	
Total			**12**	**4**	**8**	**20**	**64**	**160**	**96**	**480**	**800**	

SUBJECT TITLE: GENERAL ENGLISH
SUBJECT CODE: GE-101
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
2	1		3

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

COURSE OBJECTIVE: Reading Skills: The ability to read English with understanding: The student is able to:

- Understand the total content and underlying meaning in the context.
- Follow sequence of ideas, facts etc;
- Locate significant points and features;
- Identify and understand phrase or sentence groups.
- Grasp meaning of words and sentences.

Writing Skills: The ability to write English correctly: The student is able to:

- Master the Mechanics of writing; the use of correct punctuation marks and capital letters;
- Spell words correctly;
- Write neatly and legibly with reasonable speed;
- Use appropriate vocabulary;
- Use correct grammatical items;
- Write coherently in more than one paragraph;
- Complete accurately and fluently semi controlled compositions like stories, events, processes etc;

Sr. No.	Contents	Contact Hours
UNIT-I	**Module I** **READING** • Unseen prose and poetry passages for language comprehension and appreciation. Unseen passages with a variety of very short answer / short answer or MCQ type questions to test comprehension, interpretation and inference. Vocabulary such as word formation and inference of meaning	**8**

	will also be tested. • The total length of the passages will be between 1100 – 1200 words. The passage will include the following: • Factual passages, e.g., instructions, descriptions, reports. • Descriptive passages involving opinion, e.g., argumentative, persuasive or interpretative text. • Literary passages, e.g., extract from fiction, drama, poetry, essay or biography. A poem could be of 28-35 lines.	
UNIT-II	**Module II** **Grammar** Punctuation, Parts of speech, Spellings, word formation and vocabulary, Tense, Phrasal verbs and idiomatic expressions, Modals	**6**
UNIT-III	**Module III** **WRITING** **Essay Writing** -on a topic of general topic. **Report Writing** (Press Reports) Suggested topics: Accidents, Natural Calamities and the Celebration of Festivals	**6**
UNIT-IV	**Module IV** **Letter types include** • Business or official letters (for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies) • Letters to the editor (giving suggestions or opinion on issues of public interest • Application for a job	**5**
UNIT-V	Writing formal and informal invitations and replies	**5**

Course Outcomes:

- On successful completion of this course, the learner will be able to

BOTAT-1105. 1	Apply the practical knowledge of using action words in sentence construction during report writing
BOTAT-1105. 2	Apply and analyse the right kind of pronunciation with regards to speech sounds and able to get different types of pronunciations while interacting with patients
BOTAT-1105. 3	Apply the concepts of accurate English while writing and become equally at ease in using good vocabulary and language skills.
BOTAT-1105. 4	Understand the importance of pronunciation and apply the same in day to day conversation with staff and patients

Recommended books:

1. Oxford Practice Grammar by John Eastwood (Ed. 2014)
2. Wren, P.C.; Martin, H.; Prasada Rao, N.D.V. (1973–2010). **High School English Grammar & Composition**
3. Oxford Practice Grammar Advanced, G. Yule (Oxford)

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: ANATOMY AND PHYSIOLOGY
SUBJECT CODE: BOTAT-1101
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective:
Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body. This subject will develop an understanding of the structure and function of organs and organ systems in normal human body.

SECTION I: ANATOMY:

Sr. No.	Contents	Contact Hours
UNIT-I	Definitions, Subdivisions of Anatomy,Terms of location and positi Fundamental Planes, organization of human body. Cell (structure function). Tissues (Epithelium, Connective, Muscular, Nervous)	**6**
UNIT-II	*Skeletal system:* Types of bones, Bones and their parts, Divisions of skeleton *Joints:* classification, types of movements with examples.	**6**
UNIT-III	*Central nervous system*: Spinal Cord (anatomy, functions), reflex-meninges. *Brain:* Hind Brain, Midbrain, Forebrain	**6**
UNIT-IV	Anatomical introduction to skin & Sense organs: Eye, Ear, Nose	**4**
UNIT-V	Circulatory system: *Heart:* size, location, coverings, chambers, bl supply, the blood vessels. General plan of circulation, pulmon circulation. Names of arteries and veins and their positions	**6**

SECTION II: PHYSIOLOGY

Sr. No.	Contents	Contact Hours
UNIT-I	**Cell : St**ructure & function	**2**
UNIT-II	**Blood:** Blood cells, Haemoglobin, Blood groups, Coagulation Coagulation Factors, Anemia *Immunoglobulin's:* Types & functions	**6**
UNIT-III	**Cardiovascular system:** Heart rate, cardiac cycle, cardiac output, blood pressure, hypertension, radial pulse	**6**

UNIT-IV	**Respiratory System**: Mechanism of respiration, Lung Volumes capacities	**5**
UNIT-V	**Gastrointestinal System**: Process of digestion in various parts	**5**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1101. 1	Understand the basic fundamentals structural features of neurons, mechanism of neurotransmitters along with processes of Neuro-conduction and neurotransmission.
BOTAT-1101. 2	Clarify the anatomy and physiology of various sense organs involved in body homeostasis
BOTAT-1101. 3	Understand the organs and mechanism involve in respiration along with disorders of respiratory system
BOTAT-1101. 4	Understand the essential organs of urinary systems and process of urine formation

Suggested Readings:

Anatomy &Physiology- Ross and Wilson
Anatomy and Physiology: Understanding the Human Body by Clark
Anatomy and Physiology for nurses by Evelyn Pearce
Anatomy and Physiology for nurses by Sears
Anatomy and Physiology for nurses by Pearson
Anatomy and Physiology by N Murgesh

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: CENTRAL STERILE SERVICES DEPARTMENT (CSSD) PROCEDURES
SUBJECT CODE: BOTAT-1102
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

COURSE OBJECTIVE: Students will be able to learn the cleaning, assembly, sterilization, storage and distribution of sterilized materials from a CSSD. To provide an efficient, continuous and quality supply of sterilized material to hospital in various areas and infection free patient care.

Sr. No.	Contents	Contact Hours
UNIT-I	• Cleaning and dusting: methods of cleaning, composition of dust. • General care and testing of instruments: forceps, haemostatic, needle holders, knife, blade, scissor, use/ abuse, care during surgery. • Disinfectants of instruments and sterilization- definition, methods, cleaning agents, detergents, mechanical washing, ultrasonic cleaner, lubrication, inspection and pitfalls	**2**
UNIT-II	• Thermal, hot air oven, dry heat, autoclaving, steam sterilization water etc, UV treatment. • Various methods of chemical treatment: formalin, glutaraldehyde • Instrument's etching, care of micro surgical and titanium instruments • Sterilization of equipments: arthroscope, gastroscope, imago lamp, apparatus, suction apparatus, anaesthetic equipments including endotracheal tubes.	**6**
UNIT-III	• Materials used for wrapping and packing assembling pack contents. Types of packs prepared. • Inclusion of trays and galli parts in packs. Method of wrapping	**6**

	and making use of indications to show that a pack of container has been through a sterilization process date stamping.	
UNIT-IV	• OT Sterilization including laminar air flow. • Fumigation of OT: Principle & procedure • Waste disposal collection of used items from user area, reception protective clothing and disinfections sage guards.	**5**
UNIT-V	• Trouble shooting: colored spots and corrosion, staining, dust deposit, recent amendment in EPA with reference to waste disposal	**5**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1102.1	Demonstrate theory and practical skills in microscopy and their handling techniques and staining procedures
BOTAT-1102. 2	Understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes and also Understand the structural similarities and differences among various physiological groups of bacteria/archaea
BOTAT-1102. 3	Know various Culture media and their applications and also understand various physical and chemical means of sterilization
BOTAT-1102. 4	Master aseptic techniques and be able to perform routine culture handling tasks safely and effectively

Suggested Readings:

1. Manual of Anesthesia for Operation Theater Technicians by S Ahanatha Pillai
2. Textbook for Operation Theater Technicians - Jaypee Digital
3. Berry, Edna Carnelia & MarieLoius Kohn introduction to OR Techniques 4th edition
4. Dixon, Elleen-Theatre techniques-5th edition
5. Operation Theatre manual by M M Kapoor

Instructions of Question Paper Setter: The Question Paper should be divided into three parts. **Part A** shall consist of 12 MCQ's of 1Marks each

Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: BASIC HAEMATOLOGY
SUBJECT CODE: BOTAT-1103
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

COURSE OBJECTIVE: The students will be made aware of the composition of blood and methods of estimating different components of blood. Students will be able to know the basic concepts of Haematology & routine clinical investigations of Haematology laboratory

Sr. No.	Contents	Contact Hours
UNIT-I	• Introduction to Haematology • Definition • Importance • Important equipment used	**10**
UNIT-II	• Laboratory organization and safety measures in hematology Laboratory	**6**
UNIT-III	• Introduction to blood, its composition, function and normal cellular components. ABO and RH groups	**6**
UNIT-IV	• Formation of cellular components of blood: • Erythropoiesis • Leucopoiesis • Thrombopoiesis	**5**
UNIT-V	• Collection and preservation of blood sample for vari hematological investigations.	**6**
UNIT-VI	• Definition, principles, Normal values, Clinical significance, errors involved, means to minimize errors for the following: • Haemoglobinometry • Total leucocytes count (TLC) • Differential leucocytes count (DLC) • Erythrocyte Sedimentation Rate (ESR)	

	• Packed cell volume/ Haematocrit value • Red cell Indices (RCI) • Absolute Eosinophil count • Reticulocyte count • Platelet Coun	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1103. 1	Perform basic hematological laboratory testing, assess laboratory data and report findings according to laboratory protocol.
BOTAT-1103. 2	Adapt hematology laboratory techniques and procedures when errors and discrepancies in results are obtained to effect resolution in a professional and timely manner.
BOTAT-1103. 3	Distinguish normal and abnormal hematological laboratory findings to predict the diagnosis of hematological disorders and diseases.
BOTAT-1103. 4	Recognize laboratory results consistent with leukemia and other white blood cell disorders.

Suggested Readings:

Suggested Readings:

1. Text book of Medical Laboratory Technology by Paraful B. Godkar
2. Medical laboratory Technology by KL Mukherjee Volume-I
3. Haematology for students Practitioners by Ramnik Sood
4. Hand book of Medical Laboratory Technology (IInd edition) by V.H. Talib
5. Haematology (International edition) Emmanuel C. Besa Harwal Publisher
6. Practical Haematology by JB Dacie
7. Practical Haematology (8^{th} edition) by Sir John
8.

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

Program Name: B.Sc. Operation Theatre and Anesthesia Technology
Program Code: OTAT-301

SUBJECT TITLE: CONCEPTUAL MICROBIOLOGY & BIOCHEMISTRY
SUBJECT CODE: BOTAT-1104
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

COURSE OBJECTIVE: Microbiology: Microbiology is the fundamental course to learn about the evolution of the microorganisms and their relation shop with the ecosystem. The course helps students learn about various agents of diseases caused by a microorganism.Biochemistry: In the present scenario study of Biochemistry is highly relevant, biochemistry students can aspire for bigger roles in industry as well as academia. Some of its scope in medical sciences and other fields.

Sr. No.	Contents	Contact Hours
UNIT-I	**Origin and Evolution of Microbiology** • Introduction, History & scope of Microbiology • General characteristics of Microorganisms: Bacteria, viruses, fungi.	**3**
UNIT-II	**Study of Common Lab Instruments** • Microscope: Types, principles & uses • Autoclave, Hot air oven, Incubator, Laminar air flow, Colony counter: Principles & uses	**3**
UNIT-III	**Morphology of Bacteria & Viruses** • *Bacterial anatomy:* Cell wall, • Cell membrane,Capsule, • Flagella, Nucleoid, Bacterial Spore. • Structure of viruses, Concepts of replication & cultivation • Study of bacteria: Preparation of Stains, various Staining techniques (Simple staining, Gram staining, Acid-fast staining, Negative staining & Albert staining).	**6**
UNIT-IV	**Growth & Nutrition of bacteria:** • Culture media and Culture methods • *Bacterial Growth:* Growth Curve, Generation Time, Environmental factors affecting growth. • Bacterial nutrition: Nutritional groups, Common Nutritional requirements	**5**
UNIT-V	**Control of Microbial Growth** • Sterilization and disinfection	**2**

UNIT-VI	**Immunity & Infection** • *Immunity:* Types of immunity, Antigens & Antibodies, Prophylactic Immunization • *Infection:* Types, Various routes & modes of transmission, Nosocomial Infections	**3**
UNIT-VII	**Biomedical Waste & Management** • Waste categories, Waste treatment & disposal	**5**
UNIT-VIII	**Introduction to Biochemistry** • Important definitions & scope of biochemistry	**2**
UNIT-IX	**Biomolecules** • *Brief description & importance of various biomolecules:* Carbohydrates, Proteins, Lipids, Nucleic Acid, Enzyme: • *Electrolytes:* Source, function & deficiency symptoms of Sodi Potassium, Calcium, phosphorus, Iron, Zinc & Chloride in hur body.	**5**
UNIT-X	• **Analytical Chemistry** • ***Normal Values & Interpretations:*** • *Electrolytes:* Sodium, Potassium, Calcium, Iron, Chloride • *Renal Function Test*: Urea, Creatinine, Uric Acid, Glucose • *Urine Analysis:* Composition, Colour, Volume, pH, Specific Gravity, Turbidity • *Liver Function Test:* SGOT, SGPT, Bilirubin, Albumin, Globulin & Alkaline Phosphatase • *Carbohydrates:* Fasting, Random, GTT • *Lipid Profile:* Cholesterol, Triglycerides, HDL, LDL, VLDL	**6**
UNIT-XI	**Acids & Bases** • Acid & Base, pH ,Buffer Solutions	**4**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1105. 1	Understand the basic fundamentals structural features of neurons, mechanism of neurotransmitters along with processes of Neuro conduction and neurotransmission.
BOTAT-1105. 2	Clarify the anatomy and physiology of various sense organs involved in body homeostasis
BOTAT-1105. 3	Understand the organs and mechanism involve in respiration along with disorders of respiratory system
BOTAT-1105. 4	Understand the essential organs of circulatory systems and process of blood circulation

Suggested Readings:

1. Biochemistry by Mary K. Campbell, Shawn O. Farrell
2. Biochemistry Illustrated: Biochemistry and Molecular Biology in the Post-Genomic Era
3. Biochemistry by Donald Voet, Judith G. Voet Brock Biology of Microorganisms,14th Edition.
4. Microbiology: An Introduction, 13th Edition.
5. Clinical Microbiology Made Ridiculously Simple, 6th Edition.
6. Prescott's Microbiology, 10th Edition.
7. Jawetz Melnick & Adelbergs Medical Microbiology, 27th Edition.

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: ANATOMY AND PHYSIOLOGY (PRACTICAL)
SUBJECT CODE: BOTAT-1105
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective:
Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body. This subject will develop an understanding of the structure and function of organs and organ systems in normal human body.

SECTION I: ANATOMY:

Sr. No.	Contents	Contact Hours
UNIT-I	*Skeletal system:* Types of bones, Bones and their parts, Divisions of skeleton *Joints:* classification, types of movements with examples.	
UNIT-II	*Central nervous system*: Spinal Cord (anatomy, functions), reflex-meninges. *Brain:* Hind Brain, Midbrain, Forebrain	
UNIT-III	Circulatory system: *Heart:* size, location, coverings, chambers, bl supply, the blood vessels. General plan of circulation, pulmon circulation. Names of arteries and veins and their positions	

SECTION II: PHYSIOLOGY

Sr. No.	Contents	Contact Hours
UNIT-I	**Blood:** Blood cells, Haemoglobin, Blood groups, Coagulation Coagulation Factors, Anemia *Immunoglobulin's:* Types & functions	
UNIT-II	**Cardiovascular system:** Heart rate, cardiac cycle, cardiac output, blood pressure, hypertension, radial pulse	
UNIT-III	**Respiratory System**: Mechanism of respiration, Lung Volumes capacities	
UNIT-V	**Gastrointestinal System**: Process of digestion in various parts	**5**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1105. 1	Understand the basic fundamentals structural features of neurons, mechanism of neurotransmitters along with processes of Neuro-conduction and neurotransmission.
BOTAT-1105. 2	Clarify the anatomy and physiology of various sense organs involved in body homeostasis

BOTAT-1105. 3	Understand the organs and mechanism involve in respiration along with disorders of respiratory system
BOTAT-1105. 4	Understand the essential organs of urinary systems and process of urine formation

SUBJECT TITLE: CENTRAL STERILE SERVICES DEPARTMENT (CSSD) PROCEDURES (Practical)
SUBJECT CODE: BOTAT-1106
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

COURSE OBJECTIVE: Students will be able to learn the cleaning, assembly, sterilization, storage and distribution of sterilized materials from a CSSD. To provide an efficient, continuous and quality supply of sterilized material to hospital in various areas and infection free patient care.

Sr. No.	Contents	Contact Hours
UNIT-I	• Cleaning and dusting: methods of cleaning, composition of dust. • General care and testing of instruments: forceps, haemostatic, needle holders, knife, blade, scissor, use/ abuse, care during surgery. • Disinfectants of instruments and sterilization- definition, methods, cleaning agents, detergents, mechanical washing, ultrasonic cleaner, lubrication, inspection and pitfalls • Thermal, hot air oven, dry heat, autoclaving, steam sterilization water etc, UV treatment • Various methods of chemical treatment: formalin, glutaraldehyde • Instrument's etching, care of micro surgical and titanium	

	instruments • Sterilization of equipments: arthroscope, gastroscope, imago lamp, apparatus, suction apparatus, anaesthetic equipments including endotracheal tubes. • Materials used for wrapping and packing assembling pack contents. Types of packs prepared. Inclusion of trays and galli parts in packs. Method of wrapping and making use of indications to show that a pack of container has been through a sterilization process date stamping.	

Course Outcomes:

- On successful completion of this course, the learner will be able to

BOTAT-1106. 1	Understand and the plan, the structural framework of the operation theatre zones.
BOTAT-1106. 2	Describe measures to prevent and control sepsis in operation theatre.
BOTAT-1106. 3	Operate equipment used for sterilization and practice methods of sterilization including fumigation.
BOTAT-1106. 4	Know the significance of disposal of biomedical wastes and understand its management

SUBJECT TITLE: BASIC HAEMATOLOGY (Practical)
SUBJECT CODE: BOTAT-1107
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

COURSE OBJECTIVE: The students will be made aware of the composition of blood and methods of estimating different components of blood. Students will be able to know the basic concepts of Haematology & routine clinical investigations of Haematology laboratory.

Sr. No.	Contents	Contact Hours
UNIT-I	**Collection and preservation of blood sample for various hematological investigations.** • Haemoglobinometry • Total leucocytes count (TLC) • Differential leucocytes count (DLC) • Erythrocyte Sedimentation Rate (ESR) • Packed cell volume/ Haematocrit value • Red cell Indices (RCI) • Absolute Eosinophil count • Reticulocyte count • Platelet Count	

Course Outcomes:

- On successful completion of this course, the learner will be able to

BOTAT-1107. 1	Perform basic hematological laboratory testing, assess laboratory data and report findings according to laboratory protocol.
BOTAT-1107. 2	Adapt hematology laboratory techniques and procedures when errors and discrepancies in results are obtained to effect resolution in a professional and timely manner.
BOTAT-1107. 3	Distinguish normal and abnormal hematological laboratory findings to predict the diagnosis of hematological disorders and diseases.
BOTAT-1107. 4	Recognize laboratory results consistent with leukemia and other white blood cell disorders.

SUBJECT TITLE: CONCEPTUAL MICROBIOLOGY & BIOCHEMISTRY (Practical)
SUBJECT CODE: BOTAT-1108
SEMESTER: 1
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

COURSE OBJECTIVE: Microbiology: Microbiology is the fundamental course to learn about the evolution of the microorganisms and their relation shop with the ecosystem. The course helps students learn about various agents of diseases caused by a microorganism.Biochemistry: In the present scenario study of Biochemistry is highly relevant, biochemistry students can aspire for bigger roles in industry as well as academia. Some of its scope in medical sciences and other fields.

Sr. No.	Contents	Contact Hours
	• Culture media and Culture methods • *Bacterial Growth:* Growth Curve, Generation Time, Environmental factors affecting growth. • Bacterial nutrition: Nutritional groups, Common Nutritional requirements • Sterilization and disinfection • *Immunity:* Types of immunity, Antigens & Antibodies, Prophylactic Immunization • *Infection:* Types, Various routes & modes of transmission, Nosocomial Infections • Waste categories, Waste treatment & disposal • *Electrolytes:* Sodium, Potassium, Calcium, Iron, Chloride • *Renal Function Test*: Urea, Creatinine, Uric Acid, Glucose • *Urine Analysis:* Composition, Colour, Volume, pH, Specific Gravity, Turbidity • *Liver Function Test:* SGOT, SGPT, Bilirubin, Albumin, Globulin & Alkaline Phosphatase • *Carbohydrates:* Fasting, Random, GTT • *General description & uses of common Laboratory apparatus:* Pipettes- Burettes, Beakers, Petri dishes, Depression plates, Flasks, Funnels Bottles, Measuring cylinders, Porcelain dish, Test tubes, Centrifuge tubes, • *Working &uses of:* Spectrophotometer, Water bath, Centrifuges, Analytical Balances, pH meter, Colorimeter.	

Course Outcomes:

- On successful completion of this course, the learner will be able to

BOTAT-1108. 1	Demonstrate theory and practical skills in microscopy and their handling techniques and staining procedures
BOTAT-1108. 2	Understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes and also Understand the structural similarities and differences among various physiological groups of bacteria/archaea
BOTAT-1108. 3	Know various Culture media and their applications and also understand various physical and chemical means of sterilization
BOTAT-1108. 4	Master aseptic techniques and be able to perform routine culture handling tasks safely and effectively

SEMESTER II

SUBJECT TITLE: GENERAL ENGLISH
SUBJECT CODE: GE-201
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
2	1		3

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

COURSE OBJECTIVE:

Reading Skills:

to develop the students' reading skills to enable them to skim an adapted text for main idea, to scan an adapted text for specific information, to interpret an adapted text for inferences; Conceptual understanding, decoding, analyzing, inferring, interpreting and vocabulary.

Writing skills:

to develop the students' writing skills to enable them to respond to input applying information to a specified task, to elicit, to select, to summarize information in essays (140-160 words)

Creative expression of an opinion, skills and reasoning, justifying, Grammar illustrating, appropriacy of style and tone, using appropriate format and fluency. Applying conventions, using integrated structures with accuracy and fluency.

Listening skills:

to develop the students' listening skills to enable them to understand and apply specific information from the input (within the framework of Breakthrough level)

Speaking skills: to develop the students' speaking skills to enable them to use general, social and professional language (within the framework of Breakthrough level);

Sr. No.	Contents	Contact Hours
UNIT-I	**Module-I** One unseen passage with a variety of very short answer / short answer or MCQ type questions to test comprehension, interpretation and inference. Vocabulary such as word formation and inference of	2

	meaning will also be tested.	
UNIT-II	**Module-II** **Vocabulary:** • Antonyms • Synonyms • Idioms and Phrases • One word Substitution • Homonyms • Commonly misspelled words • Preposition	**12**
UNIT-III	**Grammar:** • Spotting Errors • Direct and Indirect speech • Active/ Passive voice • Prepositions	**12**
UNIT-IV	**Module-III** • Writing a short story based on a given outline or cue/s in about 150 - 200 words. • Writing an Article/ Descriptive Paragraph (person/ place/ event/diary entry) in about 100-150 words based on visual or verbal cue/s.	**5**
UNIT-V	**Module-III** • Writing a short story based on a given outline or cue/s in about 150 - 200 words. • Writing an Article/ Descriptive Paragraph (person/ place/ event/diary entry) in about 100-150 words based on visual or verbal cue/s.	**10**

Course Outcomes:

- On successful completion of this course, the learner will be able to

GE-201. 1	Apply the practical knowledge of using action words in sentence construction during report writing
GE-201. 2	Apply and analyse the right kind of pronunciation with regards to speech sounds and able to get different types of pronunciations while interacting with patients

GE-201. 3	Apply the concepts of accurate English while writing and become equally at ease in using good vocabulary and language skills.
GE-201. 4	Understand the importance of pronunciation and apply the same in day to day conversation with staff and patients

Recommended books:

1. English Grammar in Use, R. Murphy (Cambridge)
2. Oxford Practice Grammar Intermediate, J. Eastwood (Oxford)
3. Oxford Practice Grammar Advanced, G. Yule (Oxford)
4.

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: ANATOMY AND PHYSIOLOGY
SUBJECT CODE: BOTAT- 1201
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body. This subject will develop an understanding of the structure and function of organs and organ systems in normal human body

SECTION I: ANATOMY:

Sr. No.	Contents	Contact Hours
UNIT-I	• **Respiratory system** • Organs of Respiratory System. Brief knowledge of parts and positi • *Conducting portion:* Nose, nasal cavity, Para nasal air sinuses, Larynx, trachea, bronchial tree • *Respiratory portion:* Pleura and lungs	**6**
UNIT-II	• **Digestive system** • Components of Digestive system, Anatomy of organs of digestive system, mouth, tongue, teeth, salivary glands, liver, biliary apparatus, pancreas.	**6**
UNIT-III	• **Excretory system** • *Kidneys:* location, gross structure, excretory ducts, uret Urinary bladder, Urethra	**6**
UNIT-IV	• **Reproductive system** • *Male Reproductive System:* Testis, Duct system. • *Female Reproductive System:* Ovaries, Duct system	**4**
UNIT-V	• Circulatory system: *Heart:* size, location, coverings, chamb blood supply, the blood vessels. General plan of circulati pulmonary circulation. Names of arteries and veins and tl positions	**6**
UNIT-VI	• **Endocrine system** • *Endocrine glands:* Positions, Hormones secreted and their functions- Pituitary, Thyroid parathyroid, Adrenal glands, Gonads & Islets of pancrea	**5**

SECTION II: PHYSIOLOGY

Sr. No.	Contents	Contact Hours
UNIT-I	**Excretory system** Structure of nephron, Mechanism of urine formation	**2**
UNIT-II	**Central Nervous System** motor neuron system, Lower motor neuron system Sensory Nervous system, Sympathetic Nervous system, Parasympathetic nervous system	**6**
UNIT-III	**Muscular System** Classification of muscles & their functions	**6**

UNIT-IV	**Special Senses** Eye & ear (in brief)	**5**
UNIT-V	**Endocrinology** List of endocrine glands, Hormones -their secretion and functions (in brief)	**5**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1203. 1	Understand the basic fundamentals structural features of neurons, mechanism of neurotransmitters along with processes of Neuro-conduction and neurotransmission.
BOTAT-1203. 2	Clarify the anatomy and physiology of various sense organs involved in body homeostasis
BOTAT-1203. 3	Understand the organs and mechanism involve in respiration along with disorders of respiratory system
BOTAT-1203. 4	Understand the essential organs of urinary systems and process of urine formation

Suggested Readings:

1. Anatomy & Physiology- Ross and Wilson
2. Anatomy and Physiology: Understanding the Human Body by Clark
3. Anatomy and Physiology for nurses by Evelyn Pearce
4. Anatomy and Physiology for nurses by Sears
5. Anatomy and Physiology for nurses by Pearson
6. Anatomy and Physiology by N Murgesh

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: APPLIED PATHOLOGY
SUBJECT CODE: BOTAT-1202
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
4	1		5

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Outcomes: Develop competency in techniques of pathology branches like haematology, clinical pathology, blood bank, histopathology and cytology. Acquire knowledge and understand the formation of blood cells, structure, functions and methods of estimating different parameters

Sr. No.	Contents	Contact Hours
UNIT-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) Ischemic 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.	**15**
UNIT-II	**2.** Haematology a) Anemia: definition, morphological types and diagnosis of anemia, brief concept about	**12**

	hemolyticanemia and polycythemia. b) Leukocyte disorders: leukemia, leukocytosis, agranulocytosis etc. c) Bleeding disorders: definition, classification, causes & effects of important types of bleeding disorders, various laboratory tests used to diagnose bleeding disorders.	
UNIT-III	**3.** 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	**12**
UNIT-IV	**4.** 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	**12**

Course Outcomes:

- On successful completion of this course, the learner will be able to

BOTAT-1202. 1	Recognises the need to read a whole pathology report, including comments, when ascertaining the significance of the result.
BOTAT-1202. 2	Demonstrates understanding of infection control and application in clinical practice, including measures available for preventing the transmission of infection (hand hygiene, 'bare below elbows', aseptic techniques, use of personal protective equipment).
BOTAT-1202. 3	Demonstrates understanding of legal and practical framework in handling human tissue and embryos.
BOTAT-1202. 4	Understands the importance of sample labelling and how incorrect labelling may contribute to diagnostic errors.

Suggested Readings:

1. Robbins and Cotran Review of Pathology, 5th Edition by Edward C. Klatt & Vinay Kumar
2. Crash Course Pathology, 5th Edition byOlivia Mckinney & Isabel Woodman & Hizbullah Shaikh & Shreelata T Datta & Philip Xiu
3. Pathology Illustrated, 8th Edition by Fiona Roberts & Elaine MacDuff

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.

Part A shall consist of 12 MCQ's of 1Marks each

Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice

Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: SURGICAL INSTRUMENTS AND MONITORING
SUBJECT CODE: 1203
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: The student will be able prepare instruments and supplies necessary for the continual function of the operating room and multifunction disciplines in the hospital and specialty settings. The student will learn effective communication skills with members of the healthcare team and develop a basic understanding of the disease process

Sr. No.	Contents	Contact Hours
UNIT-I	• Common general surgical instruments • Gynecology and obstetrics instruments	**10**
UNIT-II	• Orthopedic instruments • Urological instruments	**10**
UNIT-III	• Laparoscopic instruments • Monitoring- introduction and basic monitoring	**10**
UNIT-IV	• Monitoring of cardio vascular system- pulse rate, blood pressure, ECG, CVP, ABG • Monitoring of respiratory system- PFT, oxygen saturation, • minute volume, $ETCO_2$	**10**
UNIT-V	• Temperature monitoring • Blood loss monitoring • Urine output	**12**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1203. 1	The student will be able prepare instruments and supplies necessary for the continual function of the operating room and multifunction disciplines in the hospital and specialty settings
BOTAT-1203. 2	Identify basic instruments by type, function, and name.
BOTAT-1203. 3	Demonstrate proper care, handling techniques, and safety precautions of surgical instruments.
BOTAT-1203. 4	Perform and document the pre operative visit/consultation of a patient with an acute surgical condition and describe the procedure in a way the patient can understand.

Suggested Readings:

1. Manual of Anesthesia for Operation Theater Technicians by S Ahanatha Pillai
2. Textbook for Operation Theater Technicians - Jaypee Digital
3. Berry, Edna Carnelia & MarieLoius Kohn introduction to OR Techniques 4th edition
4. Dixon, Elleen-Theatre techniques-5th edition
5. Operation Theatre manual by M M Kapoor

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: ANAESTHESIA EQUIPMENTS AND TECHNOLOGY
SUBJECT CODE: BOTAT-1204
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
4	1		5

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: The student will be able prepare instruments and supplies necessary for the continual function of the operating room and multifunction disciplines in the hospital and specialty settings.

Sr. No.	Contents	Contact Hours
UNIT-I	**Medical Gas Supply** • Compressed gas Cylinders • Colour coding • Cylinders and Cylinder valves • Cylinder storage • Diameter index safety system • Medical gas pipeline system and station outlets • Air compressors • Oxygen concentrators • Alarms and safety devices	**5**

UNIT-II	**Gas Administration Devices** • Simple oxygen administration devices • Methods of controlling gas flow • Reducing valves • Flow meters • Regulators • Flow restrictors	**5**
UNIT-III	**Oxygen Therapy** • Definition • Causes and responses to hypoxemia • Clinical signs of hypoxemia • Goals of oxygen therapy • Evaluation of patients receiving oxygen therapy • Hazards of oxygen therapy	**5**
UNIT-IV	**Anaesthesia Machine** Hanger and yoke system • Cylinder pressure gauge, pin index • Pressure regulator • Flow meter assembly Vaporizers – Types, hazards, maintenance, filling and draining.	**4**
UNIT-V	**Breathing System** General considerations • Classification and breathing system • Mapleson system • Jackson Rees system of Bain circuit • Non breathing valves – Ambu valves	**5**
UNIT-VI	**Gas Analyzers Pulse Oximeter CO_2 Monitor** Pulse oximeters • Capnographs	**2**
UNIT-VII	**Manual Resuscitators** Types of resuscitator bags • Methods of increasing oxygen delivery capabilities while using oxygen with resuscitator bags.	**5**
UNIT-VIII	Artificial air ways (oral and Nasal endotracheal tubes, Tracheostomytubes**)**	**5**

	Parts of airway and features • Types, sizes and methods of insertion • Indications for use • Care of long-term airways and complications • Protocol for tracheostomy de-cannulation • Face masks – Types, sizes and its usage	
UNIT-IX	**Methods of Cleaning and Sterilization of Anesthetic Equipments**	**4**
UNIT-X	**Minimum Standards for Anesthesia** • Patient assessment and preparation • Ten golden rules of anesthesia • Checking the drugs and equipment • Keeping the airway clear • Be ready to control ventilation • Monitor pulse and BP	**6**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1204. 1	Contribute to a team of central sterile processing professionals who are all working together to maintain sterilization and storage.
BOTAT-1204. 2	To prepare CSSD professionals to practice appropriate Infection control protocols.
BOTAT-1204. 3	Clean, disinfect and distribute sterilized instrumentation and equipment to an emergency department, intensive care unit, the labor and delivery unit, operating room and other areas of health care facilities in a scientific manner.
BOTAT-1204. 4	To update the latest standards, guidelines and best practices of instrument reprocessing.

Suggested Readings:

1. Manual of Anesthesia for Operation Theater Technicians by S Ahanatha Pillai
2. Textbook for Operation Theater Technicians - Jaypee Digital
3. Berry, Edna Carnelia & MarieLoius Kohn introduction to OR Techniques 4th edition

4. Dixon, Elleen-Theatre techniques-5th edition
5. Operation Theatre manual by M M Kapoor

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: ANATOMY AND PHYSIOLOGY (Practical)
SUBJECT CODE: BOTAT- 1205
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course objective : Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body. This subject will develop an understanding of the structure and function of organs and organ systems in normal human body

Sr. No.	Contents	Contact Hours
	SECTION I: ANATOMY • Organs of Respiratory System. Brief knowledge of parts and position • *Conducting portion:* Nose, nasal cavity, Para nasal air sinuses, Larynx, trachea, bronchial tree • *Respiratory portion:* Pleura and lungs • Components of Digestive system, Anatomy of organs of digestive system, mouth, tongue, teeth, salivary glands, liver, biliary apparatus, pancreas. • *Kidneys:* location, gross structure, excretory ducts, ureters, Urinary bladder, Urethra. • *Male Reproductive System:* Testis, Duct system.	**30**

	SECTION II: PHYSIOLOGY • Structure of nephron, Mechanism of urine formation • Classification of muscles & their functions • Eye & ear (in brief)	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1205. 1	Understand the basic fundamentals structural features of kidney, mechanism of urine formation.
BOTAT-1205. 2	Clarify the anatomy and physiology of various Endocrine glands and their functions
BOTAT-1205. 3	Understand the organs and mechanism involve in respiration along with disorders of respiratory system
BOTAT-1205. 4	Understand the major and essential type of muscles

SUBJECT TITLE: APPLIED PATHOLOGY (Practical)
SUBJECT CODE: BOTAT-1206
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Develop competency in techniques of pathology branches like haematology, clinical pathology, blood bank, histopathology and cytology. Acquire knowledge and understand the formation of blood cells, structure, functions and methods of estimating different parameters

Sr. No.	Contents	Contact Hours
	• Chronic obstructive airway diseases: definition and types, causes, pathology and complications of each type of COPD • Concept about obstructive versus restrictive pulmonary disease	**30**

	• Pneumoconiosis: definition, types, pathology and effects • Pulmonary congestion and edema • Pleural effusion: causes, effects and diagnosis • Clinical manifestations of renal diseases, causes, mechanism, effects and laboratory diagnosis of ARF & CRF, glomerulonephritis and pyelonephritis. • End stage renal disease: definition, causes, effects and role of dialysis and renal transplantation in its management • Brief concept about obstructive uropathy.	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1206.1	Recognises the need to read a whole pathology report, including comments, when ascertaining the significance of the result.
BOTAT-1206.2	Demonstrates understanding of infection control and application in clinical practice, including measures available for preventing the transmission of infection (hand hygiene, 'bare below elbows', aseptic techniques, use of personal protective equipment).
BOTAT-1206.3	Demonstrates understanding of legal and practical framework in handling human tissue and embryos.
BOTAT-1206.4	Understands the importance of sample labelling and how incorrect labelling may contribute to diagnostic errors.

SUBJECT TITLE: SURGICAL INSTRUMENTS AND MONITORING (Practical)
SUBJECT CODE: 1207
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: The student will be able prepare instruments and supplies necessary for the continual function of the operating room and multifunction disciplines in the hospital and specialty settings. The student will learn effective communication skills with members of the healthcare team and develop a basic understanding of the disease process

Sr. No.	Contents	Contact Hours
	• Common general surgical instruments • Gynaecology and obstetrics instruments • Orthopedic instruments • Urological instruments • Laparoscopic instruments • Monitoring- introduction and basic monitoring • Monitoring of cardio vascular system- pulse rate, blood pressure, ECG, CVP, ABG • Monitoring of respiratory system- PFT, oxygen saturation, minute volume, $ETCO_2$ • Temperature monitoring • Blood loss monitoring • Urine output	**30**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1207.1	The student will be able prepare instruments and supplies necessary for the continual function of the operating room and multifunction disciplines in the hospital and specialty settings
BOTAT-1207.2	Identify basic instruments by type, function, and name.
BOTAT-1207.3	Demonstrate proper care, handling techniques, and safety precautions of surgical instruments.
BOTAT-1207.4	Perform and document the pre operative visit/consultation of a patient with an acute surgical condition and describe the procedure in a way the patient can understand.

SUBJECT TITLE: ANAESTHESIA EQUIPMENTS AND TECHNOLOGY (Practical)
SUBJECT CODE: BOTAT-1208
SEMESTER: 2
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: The student will be able prepare instruments and supplies necessary for the continual function of the operating room and multifunction disciplines in the hospital and specialty settings.

Sr. No.	Contents	Contact Hours
	• Compressed gas Cylinders • Colour coding • Cylinders and Cylinder valves • Cylinder storage • Diameter index safety system • Medical gas pipeline system and station outlets • Air compressors • Oxygen concentrators • Alarms and safety devices • Methods of controlling gas flow • Reducing valves • Flow meters • Regulators • Flow restrictors • Parts of airway and features • Types, sizes and methods of insertion • Indications for use • Care of long-term airways and complications • Protocol for tracheostomy decannulation • Face masks – Types, sizes and its usage	**30**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-1208.1	Contribute to a team of central sterile processing professionals who are all working together to maintain sterilization and storage.
BOTAT-1208.2	To prepare CSSD professionals to practice appropriate Infection control protocols.
BOTAT-1208.3	Clean, disinfect and distribute sterilized instrumentation and equipment to an emergency department, intensive care unit, the labor and delivery unit, operating room and other areas of health care facilities in a scientific manner.
BOTAT-1208.4	To update the latest standards, guidelines and best practices of instrument reprocessing.

3RD SEMESTER

SUBJECT TITLE: APPLIED PHARMOCOLOGY-1
SUBJECT CODE: BOTAT 2301
SEMESTER: 3
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Pharmacology is the science which involves all aspects of the action of drugs on living system. It is the study of the therapeutic value and/or potential toxicity of chemical agents on biological systems. It targets every aspect of the mechanisms for the chemical actions of both traditional and novel therapeutic agents.

Sr. No.	Contents	Contact Hours
UNIT-I	**Autonomic Nerves System** List of drugs acting on ANS including dose, route of administration, indications, contra indications and adverse effects.	7
UNIT-II	**Cardiovascular Drugs** Mode of action, side effects and therapeutic uses of the following drugs: • Anti-hypertensives • Anti-arrhythmic drugs. • Cardiac glycosides • Sympathetic and non-sympathetic inotropic agents. • Coronary vasodilators • *Drugs used in haemostais:* anticoagulants thrombolytics and anti-thrombolytics. • Drugs used in the treatment of shock.	10
UNIT-III	**Anaesthetic agents** • Definition of general and local anaesthetics • Classification of general anaesthetics.	8

	• Intravenous general anaesthetic agents. • Local anaesthetics: classification, mechanism of action, duration of action and methods to prolong the duration of action, preparation, dose and routes of administration.	
UNIT-IV	**Analgesics** • Definition and classification. • Routes of administration, dose, frequency of administration, side effects and management of non-opioid and opioid analgesics.	**6**
UNIT-V	**Antihistamines and Antiemetics** • Classification, mechanism of action, adverse effects, preparations, dose and routes and administration.	**5**
UNIT-VI	**CNS Stimulants & Depressants** • Alcohol • Sedatives, hypnotics and narcotics. • CNS stimulants. • Neuromuscular blocking agents and muscle relaxants.	**7**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2301. 1	To study fundamentals of pharmaceutical analysis and pharmacopoeia.
BOTAT-2301. 2	Understand basic concepts involved in errors and to know the sources of impurities and methods to determine the impurities.
BOTAT-2301. 3	Understand the chemistry of drugs with respect to their pharmacological activity
BOTAT-2301. 4	Know the metabolism, adverse effects and therapeutic value of drugs

Suggested Readings:

Suggested Readings:

1. Pharmacology: Lippincott's Illustrated Reviews.
2. USMLE Road Map - Pharmacology.
3. Katzung's Pharmacology: Examination and Board Review.
4. Kaplan Lecture Notes: Pharmacology.
5. Essential's of medical Pharmacology by K D Tripathy

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: INTRODUCTION TO OPERATION THEATREAND ANESTHESIA TECHNOLOGY- I
SUBJECT CODE: BOTAT-2302
SEMESTER: 3
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
4	1		5

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: An OT technician / Anesthesia Technician is in charge of the Operation Theatre as well as handling the equipment with care and caution. Their primary role is to assist the Surgeons, Specialist, Anesthesiologists and Nurses. Along with that they prepare and organize surgical instruments before surgery, cleaning instruments before surgery, obeying surgeons order amid surgery or crisis strategies and dealing with anesthesia equipment. Operation Theatre Technologists are required across all hospitals who conduct surgeries.

Sr. No.	Contents	Contact Hours
UNIT-I	Brief History of Anesthesia	**2**
UNIT-II	• Anaesthesia- General Terminologies *Components:* • Loss of Pain- Analgesia • Loss of Consciousness • Loss of Reflex • Reflex skeletal muscle tone • Undesirable autonomic reflexes	**4**
UNIT-III	• Brief Introduction to Patient preparation for anesthesia, • pre operative assessment and	**8**

	• premedication with its role, • Common drugs used for premedication	
UNIT-IV	• Introduction to General Principles of anaesthetic drugs – • Pharmacological classification of drugs. • Route of drug administration, • precautions in administration, • principles of drug toxicity, • prevention and treatment of poisoning adverse drug reaction, • Sedatives& Hypnotics-Barbiturate's morphine and others	**10**
UNIT-V	• *Analgesics* - Definition and classification, Routes of administration, dose, frequency of administration, Side effects and management	**8**
UNIT-VI	• *Duty of the Anaesthesia technician* - Assessment, Implementation, Evaluation, of the patient • Preparing Boyles Machine • Checking the required equipments & drugs for anesthesia • Assisting the anaesthesist • Position for Anaesthesia & Surgery • Preparation of Patient for anesthesia	**10**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2302. 1	Demonstrate ability to prepare and maintain Operation Theatre
BOTAT-2302. 2	Demonstrate ability to maintain equipment support in an acute care environment
BOTAT-2302. 3	Identify and inspire to maintain a sterile field
BOTAT-2302. 4	Manage hazardous waste and follow biomedical waste disposal protocols

Suggested Readings:

1. Manual of Anesthesia for Operation Theater Technicians by S Ahanatha Pillai
2. Textbook for Operation Theater Technicians - Jaypee Digital
3. Berry, Edna Carnelia & MarieLoius Kohn introduction to OR Techniques 4th edition
4. Dixon, Elleen-Theatre techniques-5th edition
5. Operation Theatre manual by M M Kapoor

Instructions of Question Paper Setter: The Question Paper should be divided into three parts. **Part A** shall consist of 12 MCQ's of 1Marks each

Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: INTRODUCTION TO OBSTETRICS AND GYNECOLOGY
SUBJECT CODE: BOTAT: 2303
SEMESTER: 3
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Obstetrics is the field of study concentrated on pregnancy, childbirth, and the postpartum period. As a medical specialty, obstetrics is combined with Gynaecology under the discipline known as obstetrics and gynaecology (OB/GYN) which is a surgical field. Obstetrics deals with the care of the pregnant women, the unborn baby, labor and delivery and the immediate period following childbirth. Gynecology deals with any ailment concerning the reproductive organs; uterus, fallopian tubes, cervix, ovaries, and vagina

Sr. No.	Contents	Contact Hours
UNIT-I	**Obstetrics** • Normal delivery, • forceps delivery, • episiotomy, • Caesarian Section, • Instruments of common obstetrics procedures or surgery e.g. Episiotomy, forceps delivery, Embryotomy, IUCDs, LSCS; Laparoscopy Instruments & Procedure, Caesarian Section • Twin pregnancy – Diagnosis & management • Birth control methods & Procedures • Medical termination of pregnancy. • Instruments & Techniques of MTP	**30**
UNIT-II	**Gynecology** • Clinical methods in gynecological examination	**30**

	• Common diseases of vulva, vagina • Disorders of menstruation • Various operative positions	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2303. 1	Develop competence in the medical interview and physical examination of women and incorporate ethical, social, and diversity perspectives to provide culturally competent health care.
BOTAT-2303. 2	Apply recommended prevention strategies to women throughout the life-span
BOTAT-2303. 3	Demonstrate knowledge of preconception care including the impact of genetics, medical conditions and environmental factors on maternal health and fetal development.
BOTAT-2303. 4	Explain the normal physiologic changes of pregnancy including interpretation of common diagnostic studies.

Suggested Readings:

1. Netter's Obstetrics, Gynecology & Women's Health.by Roger P. Smith Gregory.
2. Obstetrics & Gynecology.by Susan Raatz Stephenson
3. The Vagina Bible.by Dr. Jen Gunter
4. Obstetrics and Gynecology Pretest Self-Assessment and Review by Shireen Madani Sims
5. The Johns Hopkins Manual of Gynecology and Obstetrics.

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: APPLIED PHARMOCOLOGY-1 (Practical)
SUBJECT CODE: BOTAT 2304
SEMESTER: 3
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40

End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: : Pharmacology is the science which involves all aspects of the action of drugs on living system. It is the study of the therapeutic value and/or potential toxicity of chemical agents on biological systems. It targets every aspect of the mechanisms for the chemical actions of both traditional and novel therapeutic agents.

Sr. No.	Contents	Contact Hours
	• Classification of general anaesthetics. • Intravenous general anaesthetic agents. • Local anaesthetics: classification, mechanism of action, • duration of action and methods to prolong the duration of action, • preparation, dose and routes of administration. • Routes of administration, dose, frequency of administration, • side effects and management of non-opioid and opioid analgesics. • Alcohol • Sedatives, hypnotics and narcotics. • CNS stimulants. • Neuromuscular blocking agents and muscle relaxants	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2304. 1	To study fundamentals of pharmaceutical analysis and pharmacopoeia.
BOTAT-2304. 2	Understand basic concepts involved in errors and to know the sources of impurities and methods to determine the impurities.
BOTAT-2304. 3	Understand the chemistry of drugs with respect to their pharmacological activity
BOTAT-2304. 4	Know the metabolism, adverse effects and therapeutic value of drugs

SUBJECT TITLE: INTRODUCTION TO OPERATION THEATREAND ANESTHESIA TECHNOLOGY- I (Practical)
SUBJECT CODE: BOTAT-2305
SEMESTER: 3
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: : An OT technician / Anesthesia Technician is in charge of the Operation Theatre as well as handling the equipment with care and caution. Their primary role is to assist the Surgeons, Specialist, Anesthesiologists and Nurses. Along with that they prepare and organize surgical instruments before surgery, cleaning instruments before surgery, obeying surgeons order amid surgery or crisis strategies and dealing with anaesthesia equipment. Operation Theatre Technologists are required across all hospitals who conduct surgeries.

Sr. No.	Contents	Contact Hours
	Analgesics – • classification, • Routes of administration, • dose, frequency of administration, • Side effects and management • Preparing Boyles Machine • Checking the required equipments & drugs for anesthesia • Assisting the anaesthesist • Position for Anaesthesia & Surgery • Preparation of Patient for anesthesia	**30**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2305. 1	Demonstrate ability to prepare and maintain Operation Theatre
BOTAT-2305. 2	Demonstrate ability to maintain equipment support in an acute care environment
BOTAT-2305. 3	Identify and inspire to maintain a sterile field
BOTAT-2305. 4	Manage hazardous waste and follow biomedical waste disposal protocols

SUBJECT TITLE: INTRODUCTION TO OBSTETRICS AND GYNECOLOGY (Practical)
SUBJECT CODE: BOTAT: 2306
SEMESTER: 3
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Obstetrics is the field of study concentrated on pregnancy, childbirth, and the postpartum period. As a medical specialty, obstetrics is combined with Gynaecology under the discipline known as obstetrics and gynaecology (OB/GYN) which is a surgical field. Obstetrics deals with the care of the pregnant women, the unborn baby, labor and delivery and the immediate period following childbirth. Gynecology deals with any ailment concerning the reproductive organs; uterus, fallopian tubes, cervix, ovaries, and vagina

Sr. No.	Contents	Contact Hours
	• Normal delivery, • forceps delivery, • episiotomy, • Caesarian Section, • Instruments of common obstetrics procedures or surgery e.g. Episiotomy, forceps delivery, • Instruments & Procedure, • Caesarian Section • Instruments & Techniques of MTP • Clinical methods in gynecological examination • Common diseases of vulva, vagina • Various operative positions	**30**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2306. 1	Develop competence in the medical interview and physical examination of women and incorporate ethical, social, and diversity perspectives to provide culturally competent health care.

BOTAT-2306. 2	Apply recommended prevention strategies to women throughout the life-span
BOTAT-2306. 3	Demonstrate knowledge of preconception care including the impact of genetics, medical conditions and environmental factors on maternal health and fetal development.
BOTAT-2306. 4	Explain the normal physiologic changes of pregnancy including interpretation of common diagnostic studies.

SUBJECT TITLE: HUMAN VALUES AND PROFESSIONAL ETHICS

SUBJECT CODE: BOTAT- 2307

SEMESTER: 3
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
4			4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: To make the students learn to discriminate between valuable and superficial in the life. To help develop the critical ability to distinguish between essence and form, or between what is of value and what is superficial, in life - this ability is to be developed not for a narrow area or field of study, but for everyday situations in life, covering the widest possible canvas. To help students develop sensitivity and awareness; leading to commitment and courage to act on their own belief. It is not sufficient to develop the discrimination ability, it is important to act on such discrimination in a given situation. Knowingly or unknowingly, our education system has focused on the skill aspects (learning and doing) - it concentrates on providing to its students the skills to do things. In other words, it concentrates on providing "How to do" things. The aspects of understanding "What to do" or "Why something should be done" is assumed. No significant cogent material on understanding is included as a part of the curriculum. A result of this is the production of graduates who tend to join into a blind race for wealth, position and jobs. Often it leads to misuse of the skills; and confusion and wealth that breeds chaos in family, problems in society, and imbalance in nature. This course is an effort tofulfillourresponsibilitytoprovideourstudentsthissignificantinputaboutunderstanding.This course encourages students to discover what they consider valuable. Accordingly, they should be able to discriminate between valuable and the superficial in real situations in their life.

Sr. No.	Contents	Contact Hours
UNIT-I	Course Introduction - Need, Basic Guidelines, Content and	10

	Process for Value Education • Understanding the need, basic guidelines, content and process for Value Education. • Self-Exploration–what is it?- its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration. • Continuous Happiness and Prosperity- A look at basic Human Aspirant • Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority. • Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario • Method to fulfill the above human aspirations: understanding and living	
UNIT-II	**Harmony at various levels** • Understanding Harmony in the Human Being - Harmony in Myself! • Programs to ensure Sanyam and Swasthya • Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship • Understanding harmony in the Family- the basic unit of human interaction • Understanding values in human-human relationship • Understanding the harmony in the society (society being an extension of family)	**10**
UNIT-III	**Implications of the above Holistic Understanding of Harmony on Professional Ethics** • Definitiveness of Ethical Human Conduct • Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order • Competence in professional ethics	**10**
UNIT-IV	• Introduction to Professional ethics • Professional Ethics and Right Understanding • Ethical Concept: Code of conduct, Confidentiality, Autonomy and informed consent, Beneficence, Non-	**10**

	maleficence, Veracity, Fidelity • Ethical issues: Malpractice and negligence, Abortion, End of life issue • Ethical practice: Barrier of ethical practice, Organ transplantation, Care of the terminally ill, Medico legal aspects of medical records • Ethical decision making: Dilemma ,Euthanasia.	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2307. 1	To develop the ability to distinguish between what is of value and what is superficial in life.
BOTAT-2307. 2	To develop the ability to face difficult situations in life boldly and resolve them confidently.
BOTAT-2307. 3	To enable students to progress from discrimination to commitment.
BOTAT-2307. 4	To understand commitment and responsibility. They gain the ability to bring harmony to the society they live.

Suggested Readings:

1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
2. Success Secrets for Engineering Students, Smart Student Publications, 3rd Edition.
3. Ivan IIIc, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA.
4. E. F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered. Blond &Briggs, Britain.
5. A Nagraj, 1998 Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
6. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: SOCIOLOGY
SUBJECT CODE: BOTAT-2308
SEMESTER: 3
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: The objective of Subject is to create the understanding of community and social problems.

Sr. No.	Contents	Contact Hours
UNIT-I	Community-Rural community: meaning and features. Health hazards of rural communities. Health hazards of tribal communities	**10**
UNIT-II	Urban community: meaning and features. Health hazards of urban communities.	**6**
UNIT-III	Social problems of disabled (Consequences of the following social problems in relation to sickness	**8**
UNIT-IV	remedies to prevent these problems):Population explosion	**6**
UNIT-V	Poverty and unemployment, Beggary, Juvenile delinquency, Prostitution, Alcoholism, Problems of women in employment.	**8**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2308. 1	Explain the sociological perspective , broadly defined use sociological theory to explain social problems and issues
BOTAT-2308. 2	Demonstrate the ability to interpret locate Evaluate, generate and use sociologically relevant data to test hypothesis and draw evidences based conclusions
BOTAT-2308. 3	Integrate sociological theory research and data in order to assess various explanations of social phenomena and to assess social policy

BOTAT-2308. 4	To train students to understand and to interpret objectively the role of social processes

Suggested Readings:

1. A Textbook of Sociologyby NeelamKumari
2. Handbook of Medical Sociology for Nursing, Physiotherapy and Paramedical Studentby Malhotra Varun

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

4TH SEMESTER

SUBJECT TITLE: APPLIED PHARMOCOLOGY- II
SUBJECT CODE: BOTAT-2401
SEMESTER: 4
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Pharmacology is the science which involves all aspects of the action of drugs on living system. It is the study of the therapeutic value and/or potential toxicity of chemical agents on biological systems. It targets every aspect of the mechanisms for the chemical actions of both traditional and novel therapeutic agents.

Sr. No.	Contents	Contact Hours
UNIT-I	**Pharmacotherapy of Respiratory Disorders** Pharmacotherapy of bronchial asthma. Pharmacotherapy of cough. Mucokinetic and mucolytic agents	10
UNIT-II	**Corticosteroids** Classification, mechanism of action, adverse effects and complications, preparation, dose and routes of administration.	10
UNIT-III	**Diuretics** Mode of action of diuretics Adverse effects. Preparations, dose and routes of administration	10
UNIT-IV	**Chemotherapy of infections** Definition. Classification and mechanism of action of antimicrobial agents. Combination of antimicrobial agents. Chemoprophylaxis. Classification, spectrum of activity, dose, routes of administration	10

	and adverse effects of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, antitubercular drugs	
UNIT-V	**Miscellaneous** IV fluids- various preparations and their usage. Electrolyte supplements. Immunosuppressive agents. New drugs included in perfusion technology. Drugs used in metabolic and electrolyte imbalance	**5**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2401. 1	To study fundamentals of pharmaceutical analysis and pharmacopoeia.
BOTAT-2401. 2	Understand basic concepts involved in errors and to know the sources of impurities and methods to determine the impurities.
BOTAT-2401. 3	Understand the chemistry of drugs with respect to their pharmacological activity
BOTAT-2401. 4	Know the metabolism, adverse effects and therapeutic value of drugs

Suggested Readings:

1. Pharmacology: Lippincott's Illustrated Reviews.
2. USMLE Road Map - Pharmacology.
3. Katzung's Pharmacology: Examination and Board Review.
4. Kaplan Lecture Notes: Pharmacology.
5. Essential's of medical Pharmacology by K D Tripathy

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

Program Name: B.Sc. Operation Theatre and Anesthesia Technology
Program Code: OTAT-301

SUBJECT TITLE: BASIC ANESTHETIC TECHNIQUES & COMPLICATIONS
SUBJECT CODE: BOTAT-2402
SEMESTER: 4
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
4	1		5

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Provide safe and quality patient care by incorporating technical and critical thinking and clinical reasoning in assisting the anesthesia provider with patients of all types, ages, and physical conditions for a variety of surgical and medical related procedures. Assist the anesthesia provider in a variety of current anesthesia techniques and use of equipment for providing anesthesia.

Sr. No.	Contents	Contact Hours
UNIT-I	• Study the indications, instruments, technique, precautions & complications of various method of anesthesia & the anaesthetic agents in details	**5**
UNIT-II	• General Anaesthesia • Short review about stages of anaesthesia • Old G/A Sp. Ether Anaesthesia (old anaesthesia technique) • Modern Anaesthesia Balanced G/A • Induced hypotensive GA • Induced Hypothermic GA	**12**
UNIT-III	• Local anesthesia • Regional anesthesia	**8**
UNIT-IV	• Bier's block • N. blocks • Field block • Topical • Surface • Tumicent Anaesthesia (Liposuction) • Hypotensive indural • Hypothermic indural	**10**
UNIT-V	• General principles- Pharmacological classification of drugs,	**15**

	route of administration, precautions in administration, drug toxicity, adverse drug reaction. • Inhalational agents: General principles and individual agents. • Pre-anaesthetic medication. • Gases used in Anaesthesia- Sedatives and hypnotics, barbiturates. • Intravenous Anaesthetics. • Muscle relaxants. • Difficult Airway, LMA, • Post Operative care after anesthesia. • Complication of various types of anesthesia • Tracheal Intubation – Oral / Nasotracheal /LMA • Malignant Hyperpyrexia & its management resuscitation.	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2402. 1	To knowledge about general Anaesthesia, indication and complications during use.
BOTAT-2402. 2	To know about management of patients throughout General Anaesthesia.
BOTAT-2402. 3	To knowledge about general Anesthesia, indication and complications during use.
BOTAT-2402. 4	To know about management of patients throughout General Anaesthesia.

Suggested Readings:

1. Essentials of Anaesthetic Equipment, Baha Al-Shaikh Simon Stacey, 4th Edition
2. Principles of Anaesthesia Equipment, Areti Yasodananda K, 1st Edition
3. Anaesthetic Equipment Made Easy, S. Ahanatha Pillai, 1st Edition

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

Program Name: B.Sc. Operation Theatre and Anesthesia Technology
Program Code: OTAT-301

SUBJECT TITLE: MEDICINES RELEVANT TO OPERATION THEATRE & ANESTHESIA TECHNOLOGY
SUBJECT CODE: BOTAT-2403
SEMESTER: 4
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: The aim of the Medicine Relevant to Operation Theatre and Anesthesia Technology is to give medical knowledge includes the synthesis of pathophysiology, patient presentation, differential diagnosis, patient management, surgical principles, health promotion, and disease prevention. Application of this knowledge help student in patient care in their area of practice. In addition, students are expected to demonstrate an investigative and analytic thinking approach to clinical situations.

Sr. No.	Contents	Contact Hours
UNIT-I	• Diabetes mellitus • Hypertension • Ischaemic heart disease	**10**
UNIT-II	• Obesity • Elderly patient • Pregnancy	**12**
UNIT-III	• Shock • COPD • Chronic renal failure	**8**
UNIT-IV	• Chronic liver disease/failur • Anaemia • Pediatric patient, infant/neonate	**10**
UNIT-V	• Epilepsy • CVA	**15**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2403. 1	To understand about improvements of standard of living and in medical treatment and specific measures to reduce the incidence of disease.
BOTAT-2403. 2	Students also gain knowledge about causes, signs & symptoms, investigations, and treatment

BOTAT-2403. 3	Demonstrate knowledge of the various causes (genetic, developmental, metabolic, toxic, microbiologic, autoimmune, neoplastic, degenerative, and traumatic) of maladies and the ways in which they operate on the body (pathogenesis).
BOTAT-2403. 4	Demonstrate knowledge of the altered structure and function (pathology and pathophysiology) of the body and its major organ systems that are seen in various diseases and conditions.

Suggested Readings:

1. The House of God by Samuel Shem
2. Harrison's Principles of Internal Medicine edited by J. Larry Jameson, MD, PhD, Anthony S. Fauci, MD, Dennis L. Kasper, MD, et al
3. Being Mortal: Medicine and What Matters in the End by Atul Gawande
4. The Merck Manual of Diagnosis and Therapy edited by Robert S. Porter, MD

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: BIOSTATISTICS & COMPUTER APPLICATIONS
SUBJECT CODE: BOTAT-2404
SEMESTER: 4
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course objective: This course is designed to make a student to describe various application area of biostatistics Distinguish different types of data and sampling techniques. Summarize, organize and display quantitative data Calculate and interpret measures of central tendency and variability in statistical data and to provide basic knowledge of computer application and parts such as hardware software MS Word MS Office MS Excel etc

Sr. No.	Contents	Contact Hours

UNIT-I	• Definition & Calculations of mean (by both direct and shortcut method and step deviation method) mode and Median (individual observation, discrete observation and continuous observation. • Probability • Tabulation of Data Graphical Presentation of Frequency Distribution • Line frequency	**10**
UNIT-II	• Histogram (for equal and unequal class interval, inclusive data and for Midvale) • Frequency polygon • Frequency curve • Cumulative frequency curve	**12**
UNIT-III	• Computer: General Introduction, History of computer development and respective generation: Need to use computers, Applications in Laboratory and in general.	**8**
UNIT-IV	• Input and Output Device • Memory • Personal Computer • Data Representation and Number System • Software	**10**
UNIT-V	• Data Communication, Internet, Cyber etiquette • Microsoft Office: PowerPoint Presentations, Microsoft word, excel sheet • Abbreviation related to Computer	**15**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2404. 1	*Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming*
BOTAT-2404. 2	*Use different data structures and create / manipulate basic data files and developing applications for real world problems*
BOTAT-2404. 3	*Understand the basic principles of probability, descriptive statistics, and data analysis.*
BOTAT-2404. 4	*Explore the basic principles of statistics and some of its common uses.*

Suggested Readings:

1. Absolute Beginners Guide To Computing By Wallace Wang
2. Computer Basics Absolute Beginner's Guide By Michael Miller.
3. Computers For Seniors For Dummies By Nancy C.
4. Computers Made Easy: From Dummy To Geek By James Bernstein

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: APPLIED PHARMOCOLOGY- II (Practical)
SUBJECT CODE: BOTAT-2405
SEMESTER: 4
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Pharmacology is the science which involves all aspects of the action of drugs on living system. It is the study of the therapeutic value and/or potential toxicity of chemical agents on biological systems. It targets every aspect of the mechanisms for the chemical actions of both traditional and novel therapeutic agents.

Sr. No.	Contents	Contact Hours
	• Preparations, dose and routes of administration. • Classification and mechanism of action of antimicrobial agents. • Combination of antimicrobial agents. • Chemoprophylaxis. • IV fluids- various preparations and their usage. • Electrolyte supplements. • Immunosuppressive agents. • New drugs included in perfusion technology. • Drugs used in metabolic and electrolyte imbalance.	**30**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2405. 1	To study fundamentals of pharmaceutical analysis and pharmacopoeia.
BOTAT-2405. 2	Understand basic concepts involved in errors and to know the sources of impurities and methods to determine the impurities.
BOTAT-2405. 3	Understand the chemistry of drugs with respect to their pharmacological activity
BOTAT-2405. 4	Know the metabolism, adverse effects and therapeutic value of drugs

SUBJECT TITLE: BASIC ANESTHETIC TECHNIQUES & COMPLICATIONS (Practical)
SUBJECT CODE: BOTAT-2406
SEMESTER: 4
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Provide safe and quality patient care by incorporating technical and critical thinking and clinical reasoning in assisting the anesthesia provider with patients of all types, ages, and physical conditions for a variety of surgical and medical related procedures. Assist the anesthesia provider in a variety of current anesthesia techniques and use of equipment for providing anesthesia.

Sr. No.	Contents	Contact Hours
	• Local anesthesia • Regional anesthesia • Bier's block • N. blocks • Field block • Topical • Surface • Tumicent Anaesthesia (Liposuction) • Hypotensive indural	**30**

	• Hypothermic indural • Difficult Airway, LMA, • Post Operative care after anesthesia. • Complication of various types of anesthesia • Tracheal Intubation – Oral / Nasotracheal /LMA	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2406. 1	To knowledge about general anaesthesia, indication and complications during use.
BOTAT-2406. 2	To know about management of patients throughout General Anaesthesia.
BOTAT-2406. 3	To knowledge about general anaesthesia, indication and complications during.
BOTAT-2406. 4	To know about management of patients throughout General Anaesthesia. use

SUBJECT TITLE: MEDICINES RELEVANT TO OPERATION THEATRE & ANESTHESIA TECHNOLOGY (Practical)
SUBJECT CODE: BOTAT-2407
SEMESTER: 4
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: The aim of the Medicine Relevant to Operation Theatre and Anesthesia Technology is to give medical knowledge includes the synthesis of pathophysiology, patient presentation, differential diagnosis, patient management, surgical principles, health promotion, and disease prevention. Application of this knowledge help student in patient care in their area of practice. In addition, students are expected to demonstrate an investigative and analytic thinking approach to clinical situations.

Sr. No.	Contents	Contact Hours
	Description of the following diseases & their management during pre & post operative procedures	**30**

	• Diabetes mellitus • Hypertension • Ischaemic heart disease • Obesity • Elderly patient • Pregnancy • Shock • COPD • Chronic renal failure • Chronic liver disease/failure • Anaemia • Pediatric patient, infant/neonate • Epilepsy • CVA	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2407. 1	To understand about improvements of standard of living and in medical treatment and specific measures to reduce the incidence of disease.
BOTAT-2407. 2	Students also gain knowledge about causes, signs & symptoms, investigations, and treatment
BOTAT-2407. 3	Demonstrate knowledge of the various causes (genetic, developmental, metabolic, toxic, microbiologic, autoimmune, neoplastic, degenerative, and traumatic) of maladies and the ways in which they operate on the body (pathogenesis).
BOTAT-2407. 4	Demonstrate knowledge of the altered structure and function (pathology and pathophysiology) of the body and its major organ systems that are seen in various diseases and conditions.

SUBJECT TITLE: BIOSTATISTICS & COMPUTER APPLICATIONS (Practical)
SUBJECT CODE: BOTAT-2408
SEMESTER: 4
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		4	2

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objectives: This course is designed to make a student to :Describe various application area of biostatistics Distinguish different types of data and sampling techniques. Summarize,

organize and display quantitative data Calculate and interpret measures of central tendency and variability in statistical data and to provide basic knowledge of computer application and parts such as hardware software MS Word MS Office MS Excel etc

Sr. No.	Contents	Contact Hours
SECTION-I	**BIOSTATISTICS** Calculations of mean (by both direct and shortcut method and step deviation method) mode and Median (individual observation, discrete observation and continuous observation. 1. Probability 2. Tabulation of Data Graphical Presentation of Frequency Distribution 3. Line frequency 4. Histogram (for equal and unequal class interval, inclusive data and for Midvale) 5. Frequency polygon 6. Frequency curve 7. Cumulative frequency curve	15
SECTION-II	**COMPUTER APPLICATIONS** 1. Input and Output Device 2. Memory 3. Personal Computer 4. Data Representation and Number System 5. Software 6. Data Communication, Internet, Cyber etiquette 7. Microsoft Office: PowerPoint Presentations, Microsoft word, excel sheet 8. Abbreviation related to Computer	15

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-2408. 1	*Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming*

BOTAT-2408. 2	*Use different data structures and create / manipulate basic data files and developing applications for real world problems*
BOTAT-2408. 3	*Understand the basic principles of probability, descriptive statistics, and data analysis.*
BOTAT-2408. 4	*Explore the basic principles of statistics and some of its common uses.*

5TH SEMESTER

SUBJECT TITLE: ANESTHESIA TECHNOLOGY-I
SUBJECT CODE: BOTAT-3501
SEMESTER: 5
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Understand the safe anesthesia techniques for various elective and emergency procedures in and outside the operation theatre Obtain knowledge about the proper functioning of various anesthetic equipments such as the work station, anesthesia monitors, syringe pumps etc. Assist the anesthesiologists efficiently during procedures in and outside the operation theatre

Sr. No.	Contents	Contact Hours
UNIT-I	• Pre operative preparation • Pre-Anaesthetic Assessment • History of present assessment • Past history with emphasis on previous illness and surgery • Personal history – Smoking, alcohol • Physical examination – General and systemic • Informed consent	**6**
UNIT-II	• Premedication: Aims • Narcotics • Antihistaminics • Antacids • Others – NTG	**8**
UNIT-III	• *Investigations:* Preparations, Identification, Consent, NPO, Prosthesis • Lab results: • Biochemistry – Blood, glucose, Urea, Creatinine • Hematology – Hemogram, Prothrombin Time, Partial thromboplastin time, BT,CT • Urine- Complete urine analysis • ECG, Chest X-ray, ABG • Criteria used for accepting the case for surgery	**8**

UNIT-IV	• Equipment Checking the machine, laryngoscopes, tubes, airways etc. suction apparatus, oxygen Cylinder, anaesthetic drugs and emergency drugs. • Monitoring system • *Testing Machine:* Gas supply, Flow meters, O_2 bypass, Valves, Vaporizer	**6**
UNIT-V	• Induction – Anaesthesia • Endotracheal intubation, confirming the tube position and securing the tube • Maintenance of anesthesia • Fluid / Blood and electrolyte balance • Reversal from anesthesia – drugs used	**8**
UNIT-VI	• *Intubation:* Choice of ETT, Choice of Laryngoscope, Techniques of intubation, Complications, Difficult intubation • Emergency Drugs: Atropine, Epinephrine, Isoprenaline, Ephedrine, Aminophylline, Hydrocortisone, Dopamine, Norepinephrine, Dobutamine.	**8**
UNIT-VI	• *IV Infusion:* Site of cannulations, Finding a vein, Technique of venipuncture. • *Patient Protection:* eyes, ears, skin, lips, tongue, teeth, Veins, arteries, Peripheral nerves	**8**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3501. 1	Understand the preoperative evaluation, premedication and different anaesthesia techniques, in general
BOTAT-3501. 2	Understand intraoperative fluid management and pain management
BOTAT-3501. 3	Operate the monitoring devices and record the vital signs
BOTAT-3501. 4	Explain technique of general anaesthesia and regional anaesthesia

Suggested Readings:

1. Essentials of Anaesthetic Equipment, Baha Al-Shaikh Simon Stacey, 4th Edition
2. Principles of Anaesthesia Equipment, Areti Yasodananda K, 1st Edition
3. Anaesthetic Equipment Made Easy, S. Ahanatha Pillai, 1st Edition

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

Program Name: B.Sc. Operation Theatre and Anesthesia Technology
Program Code: OTAT-301

SUBJECT TITLE: SURGICAL PROCEDURES-I
SUBJECT CODE: BOTAT-3502
SEMESTER: 5
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Surgery is a medical specialty that uses operative manual and instrumental techniques on a person to investigate or treat a pathological condition such as a disease or injury, to help improve bodily function, appearance, or to repair unwanted ruptured areas

Sr. No.	Contents	Contact Hours
UNIT-I	Preparation, nursing requirement, equipments including instruments, sutures, etc.	**6**
UNIT-II	Anesthesia techniques, patient positioning & recovery	**8**
UNIT-III	Gynecological /obstetric surgery	**8**
UNIT-IV	Urologic surgery	**6**
UNIT-V	Orthopedic surgery	**8**
UNIT-VI	Neurosurgery	**8**
UNIT-VI	Ophthalmic surgery	**8**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3502. 1	Demonstrate knowledge and understanding of common surgical problems
BOTAT-3502. 2	Demonstrate an understanding of surgical treatments, and alternatives to surgical treatment
BOTAT-3502. 3	To become familiar with various surgical procedures and know their expected outcomes and complications
BOTAT-3502. 4	Be familiar with action, dosage and use of common pharmacologic agents used in surgery (analgesics, antibiotics, anticoagulants, sedatives)

Suggested Readings:

1. Manipal Manual of Surgery 5Ed
2. Sabiston Textbook of Surgery International Edition.
3. Zollinger's Atlas of Surgical Operations, 11e
4. Acute Care Surgery: Imaging Essentials for Rapid Diagnosis
5. Introduction to the Operating Room

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: ANAESTHESIA FOR SPECIALITY SURGERIES
SUBJECT CODE: BOTAT-3503
SEMESTER: 5
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: To impart basic knowledge and skills involved in dealing with handling techniques involved in dealing with anesthetic equipment in specialty surgeries as well as pre-operative, intra-operative and post postoperative patient monitoring and care. And To train students to work in conjunction with a multidisciplinary team to apply anesthesia technology to the patients in multispecialty departments multidisciplinary team to apply anesthesia technology to the patients in multispecialty departments

Sr. No.	Contents	Contact Hours
UNIT-I	**Neuro Anaesthesia** • Glasgow coma scale • Premedication • Special investigation - CT, Angiography and MRI • Checklist • Induction of a patient • Reinforced Endotracheal tubes • Positioning in neuro surgery • I.C.P	**8**

	• Air embolism • Reversal of the patient • Transferring to I.C.U. / Ward	
UNIT-II	**Obstetric Anaesthesia** • Risks for anesthesia, Precautions to be taken • Check list • Regional vs general anesthesia • Induction / maintenance and recovery. • Resuscitation of the new born, Apgar score • Reversal and extubation • Emergencies - manual removal of placenta • A.P.H. • P.P.H. • Ruptures uterus • Ectopic Pregnancy	**8**
UNIT-III	**Pediatric Anaesthesia** • Theatre setting • Check list • Premedication - modes • Induction • Intubation - Securing the EIT • Reversal & extubation – Problems • Transferring / ICU management • Pain management	**8**
UNIT-IV	**Anaesthesia for Trauma & Shock** • Resuscitation • Preop investigation I assessment • Circulatory management • Management of anesthesia • Rapid sequence induction	**8**
UNIT-V	**Thoracic Anaesthesia** • Pulmonary function tests • bed side, Vitallograph • Preoperative preparation • Premedication • Check list • Induction • Intubation	**8**

	• Double lumen tubes • monitoring • Pain management • Extubation • ICU management	
UNIT-VI	**Cardiac Anaesthesia** • NYHA classification • Arrhythmias, Angina, Dyspnoea • ***Special investigations*** -echo cardiography, angiography • Premedication • Setting up of monitoring system • Monitoring - invasive and non - invasive • Getting ready for the case • Induction of cardiac patient, precautions to be taken • Cardiopulmonary bypass • Weaning of CPB • Transferring the patient to ICU. • I.C.U management. • Chest tube management	**8**
UNIT-VI	**ENT Anaesthesia** • Anaesthesia for adenotonsillectomy • Anaesthesia for mastoidectomy • Bronchoscopy and oesophagoscopy	**6**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3503. 1	Know anaesthetic implications in different medical conditions
BOTAT-3503. 2	Assist in anaesthetic management of different surgical procedures
BOTAT-3503. 3	Understand the anaesthetic implications in Obstetrics Gynecological and Pediatric Surgeries
BOTAT-3503. 4	Learn special considerations and postoperative care in thoracic surgeries

Suggested Readings:

1. Obstetric and Gynecologic Anesthesia 1st Edition
2. Essentials of Neurosurgical Anesthesia & Critical Care
3. Principles and Practice of Anesthesia for Thoracic Surgery by Peter Slinger

4. Handbook of Pediatric Anesthesia (ANESTHESIA/PAIN MEDICINE) by McGraw-Hill Education / Medical;1st edition
5. Kaplan's Cardiac Anesthesia: In Cardiac and Noncardiac Surgery 7th Edition by Elsevier; 7th edition

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: BASIC INTENSIVE CARE & RESUSCITATION
SUBJECT CODE: BOTAT-3504
SEMESTER: 5
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: To interpret blood gases and assess acid-base status interpret an electrocardiogram and recognize important life-threatening findings Demonstrate awareness of the ethical principles pertinent to critically ill patients especially end of life care, and issues around withdrawing and withholding life support. Provide basic ventilator orders for most patients

Sr. No.	Contents	Contact Hours
UNIT-I	**Monitoring and Diagnostic Procedures in I.C.U.** • Central Venous access • Invasive hemodynamic monitoring • ECG: monitoring, different types of E.C.G, recording of E.C.G. of the patient • Defibrillators: Types, Principles and mechanism of the defibrillator Uses and safety precaution during use. • Ventilator: Care and maintenance of ventilators, suction machine, monitoring, Sterilization and disinfection of ventilators.	**8**

UNIT-II	**General Care of Patient in I.C.U.** • Care of unconscious adult and pediatric patients. • Feeding Ryle's tube insertion • Suctioning and posturing of semiconscious and unconscious patients • Care of mechanically ventilated patient • Management of: • Asepsis • Acute poisoning • Critically ill patient • Disaster management • Nutrition • Renal Failure & Liver Failure • Head Injury • Management of tetanus patients • Tracheostomy • Vascular lines - arterial, venous line • Radiography • Physiotherapy - chest physiotherapy	**8**
UNIT-III	Fluid Balance and Parenteral Nutrition	**8**
UNIT-IV	**Infectious Diseases in I.C.U.** • Antibiotics in I.C.D. • Oxygen therapy • Mechanical ventilation	**8**
UNIT-V	Acid - Base Disorders	**8**
UNIT-VI	**Cardiovascular Failure** • Inotropic support • Vasodilator drugs • Cardio pulmonary Resuscitation (CPR) -Basic life support, Advance life support- Mouth to Mouth, Mouth to E.T. tube, Ambu bag, Different airways	**8**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3504. 1	Perform resuscitation and management of the acutely ill adult and pediatric patients
BOTAT-3504. 2	Understand functions and safe application of medical devices in the area.
BOTAT-3504. 3	Perform basic life support (BLS) and advanced cardiac life support (ACLS)

BOTAT-3504.4	Independently evaluate and apply hygienic and aseptic technique for safe care in the intensive care unit/post-operative unit.

Suggested Readings:

1. Marino's The ICU Book: Print + eBook with Updates (ICU Book (Marino))
2. Textbook of Neonatal Resuscitation (NRP)
3. Critical Care Nursing Made Incredibly Easy (Incredibly Easy Series)
4. Adult CCRN Exam (With 3 Practice Tests (Barron's Test Prep))
5. Advanced Cardiovascular Life Support (ACLS) Provider Manual

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: ANESTHESIA TECHNOLOGY-I (Practical)
SUBJECT CODE: BOTAT-3505
SEMESTER: 5
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		2	1

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Understand the safe anesthesia techniques for various elective and emergency procedures in and outside the operation theatre Obtain knowledge about the proper functioning of various anesthetic equipments such as the work station, anesthesia monitors, syringe pumps etc. Assist the anesthesiologists efficiently during procedures in and outside the operation theatre.

Sr. No.	Contents	Contact Hours
	• Physical examination – General and systemic • Informed consent • *Investigations:* Preparations, Identification, Consent, NPO, Prosthesis • Lab results: • Biochemistry – Blood, glucose, Urea, Creatinine	**15**

	• Hematology – Hemogram, Prothrombin Time, Partial thromboplastin time, BT,CT • Urine- Complete urine analysis • ECG, Chest X-ray, ABG • Equipment Checking the machine, laryngoscopes, tubes, airways etc. suction apparatus, oxygen Cylinder, anaesthetic drugs and emergency drugs. • Monitoring system *Testing Machine:* Gas supply, Flow meters, O_2 bypass, Valves, Vaporizer	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3505. 1	Understand the preoperative evaluation, premedication and different anaesthesia techniques, in general
BOTAT-3505. 2	Understand intraoperative fluid management and pain management
BOTAT-3505. 3	Operate the monitoring devices and record the vital signs
BOTAT-3505. 4	Explain technique of general anaesthesia and regional anaesthesia

SUBJECT TITLE: SURGICAL PROCEDURES-I (Practical)
SUBJECT CODE: BOTAT-3506
SEMESTER: 5
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		2	1

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Surgery is a medical specialty that uses operative manual and instrumental techniques on a person to investigate or treat a pathological condition such as a disease or injury, to help improve bodily function, appearance, or to repair unwanted ruptured areas

Sr. No.	Contents	Contact Hours
	• Preparation, • nursing requirement, \	**15**

	• equipments including instruments, sutures, etc. • Anaesthesia techniques, patient positioning & recovery • Gynecological /obstetric surgery	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3506. 1	Demonstrate knowledge and understanding of common surgical problems
BOTAT-3506. 2	Demonstrate an understanding of surgical treatments, and alternatives to surgical treatment
BOTAT-3506. 3	To become familiar with various surgical procedures and know their expected outcomes and complications
BOTAT-3506. 4	Be familiar with action, dosage and use of common pharmacologic agents used in surgery (analgesics, antibiotics, anticoagulants, sedatives)

SUBJECT TITLE: ANAESTHESIA FOR SPECIALITY SURGERIES (Practical)
SUBJECT CODE: BOTAT-3507
SEMESTER: 5
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		2	1

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objectives: To impart basic knowledge and skills involved in dealing with handling techniques involved in dealing with anesthetic equipment in specialty surgeries as well as pre-operative, intra-operative and post postoperative
patient monitoring and care. And To train students to work in conjunction with a multidisciplinary team to apply anesthesia technology to the patients in multispecialty departments multidisciplinary team to apply anesthesia technology to the patients in multispecialty departments

Sr. No.	Contents	Contact Hours
	• Glasgow coma scale • Premedication • Special investigation - CT, Angiography and MRI • Checklist • Induction of a patient	**15**

	• Reinforced Endotracheal tubes • Positioning in neuro surgery • Check list • Regional vs general anesthesia • Induction / maintenance and recovery. • Resuscitation of the new born, Apgar score • Reversal and extubation • Emergencies - manual removal of placenta • Theatre setting • Check list • Premedication - modes • Induction • Intubation - Securing the EIT • Reversal & extubation – Problems • Transferring / ICU management • Pain management	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3507. 1	Know anaesthetic implications in different medical conditions
BOTAT-3507. 2	Assist in anaesthetic management of different surgical procedures
BOTAT-3507. 3	Understand the anaesthetic implications in Obstetrics Gynecological and Pediatric Surgeries
BOTAT-3507. 4	Learn special considerations and postoperative care in thoracic surgeries

SUBJECT TITLE: BASIC INTENSIVE CARE & RESUSCITATION (Practical)
SUBJECT CODE: BOTAT-3508
SEMESTER: 5
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		2	1

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: To interpret blood gases and assess acid-base status interpret an electrocardiogram and recognize important life-threatening findings Demonstrate awareness of the ethical principles pertinent to critically ill patients especially end of life care, and issues

around withdrawing and withholding life support. Provide basic ventilator orders for most patients

Sr. No.	Contents	Contact Hours
	• Central Venous access • Invasive hemodynamic monitoring • ECG: monitoring, different types of E.C.G, recording of E.C.G. of the patient • Defibrillators: Types, Principles and mechanism of the defibrillator Uses and safety precaution during use. • Ventilator: Care and maintenance of ventilators, suction machine, monitoring, Sterilization and disinfection of ventilators. • Feeding Ryle's tube insertion • Suctioning and posturing of semiconscious and unconscious patients • Care of mechanically ventilated patient	**15**

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3508. 1	Perform resuscitation and management of the acutely ill adult and pediatric patients
BOTAT-3508. 2	Understand functions and safe application of medical devices in the area.
BOTAT-3508. 3	Perform basic life support (BLS) and advanced cardiac life support (ACLS)
BOTAT-3508. 4	Independently evaluate and apply hygienic and aseptic technique for safe care in the intensive care unit/post-operative unit.

6TH SEMESTER

SUBJECT TITLE: ANESTHESIA TECHNOLOGY-II
SUBJECT CODE: BOTAT-3601
SEMESTER: 6
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objectives: Understand the safe anesthesia techniques for various elective and emergency procedures in and outside the operation theatre Obtain knowledge about the proper functioning of various anesthetic equipments such as the work station, anesthesia monitors, syringe pumps etc. Assist the anesthesiologists efficiently during procedures in and outside the operation theatre.

Sr. No.	Contents	Contact Hours
UNIT-I	• History of anesthesia in detail • Methods of anesthesia • Minimum alveolar anaesthetic concentration • Stages of anesthesia • Inhalational Anesthesia: ether, Halothane,Isoflurane, Sevoflurane, Nitrous oxide • Narcotic drugs • Opioid analgesics: Morphine, Pethidine, Fentanyl, Buprenorphine, Tramadol.	6
UNIT-II	• Difficult intubation • Muscle relaxants • Neuromuscular blockers: Suxamethorium, Pancuronium,Vecuronium,Atracurium,Rocuronium • Reversal agents	6
UNIT-III	• Intravenous anaesthetic agents: Thiopentone, Propofol, Ketamine • Intraoperative management • Confirm the identity of the patient	6

	• Transferring the patient • Recovery room – setup, things needed expected problems • Post operative complications and management • CPR • Monitoring during anesthesia and surgery	
UNIT-IV	• Nerve blockers: Benzodiazapines, Phenothazines • Neuromuscular transmission • Nerve stimulators • Reversal of neuromuscular blockage	4
UNIT-V	• Regional anesthesia: Spinal Anesthesia, Epidural Anaesthesia • Drugs acting on sympathetic nervous system: Adrenaline, Noradrenaline,Dopamine,Dobutamine,Milrinone • Isoprenaline • Local anaesthetic agents: Lignocaine, Bupivacaine	6
UNIT-VI	• Complications related to equipment • Hypoxemia • Hyercapnea • Increased airway pressure • Decreased airway pressure • Deep anesthesia • Thermal & electrical injuries • Monitoring instruments • Related to airway: Difficult intubations, Airway Trauma • Cardiovascular System: Hypotension, Hypertension, Tachycardia, Bradycardia, Arrhythmias, Ischemia & infarction	5

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3601. 1	Manage the overall upkeep of the equipment used in intensive care unit and transport of critically ill patients and assist the specialist in resuscitation, management and transfer of such patients with appropriate paraphernalia.
BOTAT-3601. 2	Contribute in planning, setting up, commissioning, maintaining and managing operation theater, emergency departments, and intensive care unit, cardiac catheterization lab and emergency response services as a team member.
BOTAT-3601. 3	Organise drugs, equipment and monitors for procedures outside operation theater including endoscopies, imaging, electro convulsive therapy and transport etc. and monitor through the procedure
BOTAT-3601. 4	Recognize the anxiety of patients in peri-operative state and appropriately

	assist to shift, induce anaesthesia and position patient for surgical procedure.

Suggested Readings:

1. Essentials of Anaesthetic Equipment, Baha Al-Shaikh Simon Stacey, 4th Edition
2. Principles of Anaesthesia Equipment, Areti Yasodananda K, 1st Edition
3. Anaesthetic Equipment Made Easy, S. Ahanatha Pillai, 1st Edition

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: SURGICAL PROCEDURES - II
SUBJECT CODE: BOTAT-3602
SEMESTER: 6
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Surgery is a medical specialty that uses operative manual and instrumental techniques on a person to nvestigate or treat a pathological condition such as a disease or injury, to help improve bodily function, appearance, or to repair unwanted ruptured areas

Sr. No.	Contents	Contact Hours
UNIT-I	Plastic and reconstructive surgery	6
UNIT-II	Otorhinolaryngologic and head and neck surgery	6
UNIT-III	Thoracic surgery	6
UNIT-IV	Cardiac surgery	4

UNIT-V	Vascular surgery	6
UNIT-VI	Organ procurement and transplantation	5
UNIT-VII	Thyroid surgery	5

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3602. 1	Demonstrate knowledge and understanding of common surgical problems
BOTAT-3602. 2	Demonstrate an understanding of surgical treatments, and alternatives to surgical treatment
BOTAT-3602. 3	To become familiar with various surgical procedures and know their expected outcomes and complications
BOTAT-3602. 4	Be familiar with action, dosage and use of common pharmacologic agents used in surgery (analgesics, antibiotics, anticoagulants, sedatives)

Suggested Readings:

1. Manipal Manual of Surgery 5Ed
2. Sabiston Textbook of Surgery International Edition.
3. Zollinger's Atlas of Surgical Operations, 11e
4. Acute Care Surgery: Imaging Essentials for Rapid Diagnosis
5. Introduction to the Operating Room

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

Program Name: B.Sc. Operation Theatre and Anesthesia Technology
Program Code: OTAT-301

SUBJECT TITLE: SPECIALIZED SURGICAL TECHNIQUES
SUBJECT CODE: BOTAT-3603
SEMESTER: 6
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objectives: Understand the safe anesthesia techniques for specialized elective and emergency procedures in the operation theatre and to Obtain knowledge about the proper functioning of various anesthetic equipments such as the work station, anesthesia monitors, syringe pumps etc. Assist the anesthesiologists efficiently during procedures in and outside the operation theatre.

Sr. No.	Contents	Contact Hours
UNIT-I	Minor surgical procedure	6
UNIT-II	Dressings & Bandages	6
UNIT-III	Injections & infusions	6
UNIT-IV	Lumbar Puncture	4
UNIT-V	Bone Marrow Biopsy	6
UNIT-VI	Liver Biopsy	5
UNIT-VII	Pericardiocentesis	5
UNIT-VII	Abdominal paracentesis	2
UNIT-IX	Thoracocentesis & Pleural Biopsy	4

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3603. 1	*Discuss post operative care of patients while performing post operative wound checks and discriminating common post-operative complications in the inpatient setting.*

BOTAT-3603. 2	*Perform a history & physical exam, interpret diagnostic studies, develop a management plan, provide patient education, document patient encounter and deliver an oral presentation of common conditions in the surgical setting.*
BOTAT-3603. 3	*Perform Special technical skills in the post operative surgical setting in an adult patient.*
BOTAT-3603. 4	*Demonstrate an understanding of scientific concepts and the knowledge necessary for: history taking, physical exam, diagnostic studies, differential diagnosis, clinical intervention and therapeutics, and health maintenance of medical conditions seen in an adult patient in the surgical setting.*

Suggested Readings:

1. Manipal Manual of Surgery 5 Edition
2. Sabiston Textbook of Surgery International Edition.
3. Zollinger's Atlas of Surgical Operations, 11th edition
4. Acute Care Surgery: Imaging Essentials for Rapid Diagnosis
5. Introduction to the Operating Roo

Instructions of Question Paper Setter: The Question Paper should be divided into three parts.
Part A shall consist of 12 MCQ's of 1Marks each
Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

Program Name: B.Sc. Operation Theatre and Anesthesia Technology
Program Code: OTAT-301

SUBJECT TITLE: ADVANCED ANESTHESIA TECHNOLOGY
SUBJECT CODE: BOTAT-3604
SEMESTER: 6
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
3	1		4

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: medical specialty that uses operative manual and instrumental techniques on a person to investigate or treat a specific pathological condition such as a disease or injury, to help improve bodily function, appearance, or to repair unwanted ruptured areas espically in vital organs such as liver, brain, kidney, heart,

Sr. No.	Contents	Contact Hours
UNIT-I	*Anaesthesia & co- existing diseases (Cardiac & pulmonary):* • Ischemic heart disease • Hypertension • Congestive cardiac failure • Arrhythmia & heart blocks • Chronic bronchitis & COPD • Bronchial asthma	6
UNIT-II	• Pediatric anesthesia	6
UNIT-III	• Liver disease and anesthesia	6
UNIT-IV	• Renal disease and anesthesia	4
UNIT-V	• Obesity and anesthesia • Diabetes mellitus and anesthesia • Thyroid disease and anesthesia	5
UNIT-VI	• *Obstetric Anaesthesia:* Epidural analgesia, Anaesthesia for LSCS, Special situations: pre–eclampsia	5
UNIT-VII	• Anaesthesia for common surgical disorders • Anaesthesia for Thoracic Surgery • Use of double lumen tubes • Anesthesia for bronchoscopy, Thymectomy • *Anaesthesia for cardiac surgery:* Preparations & monitoring,	5

	Heparin & Protamine, Care & use of arterial & venous lines, Maintenance of body temperature. Anaesthesia for open heart surgery • Transport to ICU	
UNIT-VII	• Anaesthesia for special situations: Shock, low cardiac output & cardiac arrest	2
UNIT-IX	• Ventilators – types & methods of ventilation • Humidification • Aerosol therapy • Resuscitation of the Newborn	4
UNIT-X	• Anaesthesia for ophthalmic surgeries.	4

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3604. 1	Observe the basic operations of the operation theatre while interacting with the multidisciplinary team members involved in providing optimal care to the patients
BOTAT-3604. 2	Introduced to techniques used for preparation and management of the OT.
BOTAT-3604. 3	Understand functions and safe application of medical devices in speciality surgical procedures
BOTAT-3604. 4	*Perform Special technical skills in the post operative Anaesthesia Care unit (PACU)*

Suggested Readings:

1. Obstetric and Gynecologic Anesthesia 1st Edition
2. Essentials of Neurosurgical Anesthesia & Critical Care
3. Principles and Practice of Anesthesia for Thoracic Surgery by Peter Slinger
4. Handbook of Pediatric Anesthesia (ANESTHESIA/PAIN MEDICINE) by McGraw-Hill Education / Medical;1st edition
5. Kaplan's Cardiac Anesthesia: In Cardiac and Noncardiac Surgery 7th Edition by Elsevier; 7th edition

Instructions of Question Paper Setter: The Question Paper should be divided into three parts. **Part A** shall consist of 12 MCQ's of 1Marks each

Part B shall consist of 6 short Questions of 4 Marks each out of which 3 Questions shall have internal choice
Part C shall consists of 3 Long Questions of 8 Marks each out of which 1 question shall have internal choice

SUBJECT TITLE: ANESTHESIA TECHNOLOGY-II (Practical)
SUBJECT CODE: BOTAT-3605
SEMESTER: 6
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		2	1

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Understand the safe anesthesia techniques for various elective and emergency procedures in and outside the operation theatre Obtain knowledge about the proper functioning of various anesthetic equipments such as the work station, anesthesia monitors, syringe pumps etc. Assist the anesthesiologists efficiently during procedures in and outside the operation theatre.

Sr. No.	Contents	Contact Hours
	• Difficult intubation • Muscle relaxants • Reversal agents • Intraoperative management • Confirm the identity of the patient • Transferring the patient • Recovery room – setup, things needed expected problems • Post operative complications and management • CPR • Monitoring during anesthesia and surgery	15

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3605. 1	Manage the overall upkeep of the equipment used in intensive care unit and transport of critically ill patients and assist the specialist in resuscitation, management and transfer of such patients with appropriate paraphernalia.
BOTAT-3605. 2	Contribute in planning, setting up, commissioning, maintaining and managing operation theater, emergency departments, and intensive care unit, cardiac catheterization lab and emergency response services as a team member.
BOTAT-3605. 3	Organise drugs, equipment and monitors for procedures outside operation theater including endoscopies, imaging, electro convulsive therapy and transport etc. and monitor through the procedure
BOTAT-3605. 4	Recognize the anxiety of patients in peri-operative state and appropriately assist to shift, induce anaesthesia and position patient for surgical procedure.

SUBJECT TITLE: SURGICAL PROCEDURES - II (Practical)
SUBJECT CODE: BOTAT-3606
SEMESTER: 6
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		2	1

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Surgery is a medical specialty that uses operative manual and instrumental techniques on a person to investigate or treat a pathological condition such as a disease or injury, to help improve bodily function, appearance, or to repair unwanted ruptured areas

Sr. No.	Contents	Contact Hours
	• Plastic and reconstructive surgery • Otorhinolaryngologic and head and neck surgery • Thoracic surgery • Cardiac surgery • Vascular surgery • Organ procurement and transplantation	15

	• Thyroid surgery	

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3606. 1	*Discuss post operative care of patients while performing post operative wound checks and discriminating common post-operative complications in the inpatient setting.*
BOTAT-3606. 2	*Perform a history & physical exam, interpret diagnostic studies, develop a management plan, provide patient education, document patient encounter and deliver an oral presentation of common conditions in the surgical setting.*
BOTAT-3606. 3	*Perform Special technical skills in the post operative surgical setting in an adult patient.*
BOTAT-3606. 4	*Demonstrate an understanding of scientific concepts and the knowledge necessary for: history taking, physical exam, diagnostic studies, differential diagnosis, clinical intervention and therapeutics, and health maintenance of medical conditions seen in an adult patient in the surgical setting.*

SUBJECT TITLE: SPECIALIZED SURGICAL TECHNIQUES (Practical)
SUBJECT CODE: BOTAT-3607
SEMESTER: 6
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		2	1

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course Objective: Understand the safe anesthesia techniques for specialized elective and emergency procedures in the operation theatre and to obtain knowledge about the proper functioning of various anesthetic equipments such as the work station, anesthesia monitors, syringe pumps etc. Assist the anesthesiologists efficiently during procedures in and outside the operation theatre.

Sr. No.	Contents	Contact Hours

	To Understand the indications & techniques of following: • Minor surgical procedures • Dressings & Bandages • Injections & infusions • Lumbar Puncture • Bone Marrow Biopsy • Liver Biopsy • Pericardiocentesis	15

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3607. 1	*Discuss post operative care of patients while performing post operative wound checks and discriminating common post-operative complications in the inpatient setting.*
BOTAT-3607. 2	*Perform a history & physical exam, interpret diagnostic studies, develop a management plan, provide patient education, document patient encounter and deliver an oral presentation of common conditions in the surgical setting.*
BOTAT-3607. 3	*Perform Special technical skills in the post operative surgical setting in an adult patient.*
BOTAT-3607.4	*Demonstrate an understanding of scientific concepts and the knowledge necessary for: history taking, physical exam, diagnostic studies, differential diagnosis, clinical intervention and therapeutics, and health maintenance of medical conditions seen in an adult patient in the surgical setting.*

SUBJECT TITLE: ADVANCED ANESTHESIA TECHNOLOGY (Practical)
SUBJECT CODE: BOTAT-3608
SEMESTER: 6
CONTACT HOURS/WEEK:

Lecture (L)	Tutorial (T)	Practical (P)	Credits (C)
		2	1

Internal Assessment: 40
End Term Exam: 60
Duration of Exam: 3 Hrs

Course objective: medical specialty that uses operative manual and instrumental techniques on a person to investigate or treat a specific pathological condition such as a disease or injury, to help improve bodily function, appearance, or to repair unwanted ruptured areas espically in vital organs such as liver, brain, kidney, heart,

Sr. No.	Contents	Contact Hours
	Demonstration of • *Obstetric Anaesthesia:* • Epidural analgesia, Anaesthesia for LSCS, Special situations: pre–eclampsia • Use of double lumen tubes • Transport to ICU • Ventilators – types & methods of ventilation • Humidification • Aerosol therapy • Resuscitation of the Newborn	15

Course Outcomes:

On successful completion of this course, the learner will be able to

BOTAT-3608. 1	Observe the basic operations of the operation theatre while interacting with the multidisciplinary team members involved in providing optimal care to the patients
BOTAT-3608. 2	Introduced to techniques used for preparation and management of the OT.
BOTAT-3608. 3	Understand functions and safe application of medical devices in speciality surgical procedures
BOTAT-3608. 4	*Perform Special technical skills in the post operative Anaesthesia Care unit (PACU)*