Study Scheme & Syllabus of
Bachelor of Science
(Medical Technology- Anesthesia & Operation Theatre)
B.Sc. (MT-AOT)

Batch 2021 onwards

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IK Gujral Punjab Technical University

VISION

To be an institution of excellence in the domain of higher technical education that serves as the fountainhead for nurturing the future leaders of technology and techno- innovation responsible for the techno-economic, social, cultural and environmental prosperity of the people of the State of Punjab, the Nation and the World.

MISSION

To provide seamless education through the pioneering use of technology, in partnership with industry and society with a view to promote research, discovery and entrepreneurship and To prepare its students to be responsible citizens of the world and the leaders of technology and techno-innovation of the 21st Century by developing in them the desirable knowledge, skill and attitudes base for the world of work and by instilling in them a culture for seamlessness in all facets of life.

OBJECTIVES

- To offer globally-relevant, industry-linked, research-focused, technology- enabled seamless education at the graduate, postgraduate and research levels in various areas of engineering & technology and applied sciences keeping in mind that the manpower so spawned is excellent in quality, is relevant to the global technological needs, is motivated to give its best and is committed to the growth of the Nation.
- To foster the creation of new and relevant technologies and to transfer them to industry for effective utilization.
- To participate in the planning and solving of engineering and managerial problems of relevance to global industry and to society at large by conducting basic and applied research in the areas of technologies.
- To develop and conduct continuing education programs for practicing engineers and managers with a view to update their fundamental knowledge base and problem-solving capabilities in the various areas of core competence of the University.
- To develop strong collaborative and cooperative links with private and public sector industries and

government user departments through various avenues such as undertaking of consultancy projects, conducting of collaborative applied research projects, manpower development programs in cutting-edge areas of technology etc.

- To develop comprehensive linkages with premier academic and research institutions within the country and abroad for mutual benefit;
- To provide leadership in laboratory planning and in the development of instructional resource material in the conventional as well as in the audio- visual, the video and computer-based modes;
- To develop programs for faculty growth and development both for its own faculty as well as for the faculty of other engineering and technology institutions;
- To anticipate the global technological needs and to plan and prepare to cater to them;
- To interact and participate with the community/society at large with a view to inculcate in them a feel for scientific and technological thought and endeavor.
- To actively participate in the technological development of the State of Punjab through the undertaking of community development programs including training and education programs catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the **"deepest potential"** of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

Department of Allied Health Sciences

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VISION

- To impart knowledge of health & medical education & help in making India a centre of Medical Education & Health Care.
- To establish & develop world class self-reliant institute for imparting Medical and other Health Science education at under-graduate & post-graduate levels of the global competence.
- To serve & educate the public, establish guidelines & treatment protocols to be followed by professionals while treating in hospitals.
- To develop and provide professionally qualified health workers for augmenting the nation's human resources through Bio-Medico-Socio-epidemiological scientific research.

MISSION

- To strive incessantly to achieve the goals of the Institution.
- To impart academic excellence in Allied Health Education.
- To practice medicine ethically in line with the global standard protocols.
- Having a revolutionary impact on students by focusing on deep inter-disciplinary knowledge, getting technical as well as Theoretical concept of Health Sciences, focusing on leadership, communication and interpersonal skills, personal health and well-being.
- Creating best of educational experience by engaging with partners outside the traditional borders of University campus. By engaging in a network of Hospitals & other Healthcare providing facilities to create a job oriented
- Cultivating productive community by attracting and retaining diverse, best talent and such an environment where research, innovation, creativity and entrepreneurship can flourish.
- To give students the best knowledge by the most innovative methods and also provide hospital exposure to work in different fields of Paramedical Sciences.

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- To create a well-qualified and highly trained world class Technicians & Assistants who will aid in delivering high-class care & helping in betterment of mankind.

TITLE OF THE PROGRAM: B.Sc. MEDICAL TECHNOLOGY
(Anesthesia & Operation Theatre Technology)

YEAR OF IMPLIMENTATION: New Syllabus will be implemented from July 2022 onwards.

DURATION: The course shall be three years, with semester system (6 semesters, with two semesters in a year). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates who have passed 10+2 with Physics, Chemistry & Biology as main subjects.

INTAKE CAPACITY: 30 (Thirty)

MEDIUM OF INSTRUCTION: English.

PROGRAM EDUCATIONAL OBJECTIVES:

The Program Educational Objectives are the knowledge skills and attitudes which the students will acquire during post-graduation.

PEO1	Those who choose this stream are going to study about Anaesthesia & Surgical Equipments, Critical Care, Pain Management etc.
PEO2	Ability to analyse, Monitor & give care to a Surgical/Anaesthetized patient.
PEO3	Understand the fundamentals and applications of Anaesthesia, Surgical & Critical Care Equipments.
PEO4	Ability to Assist an Anaesthesiologist through General or Regional Anaesthesia.
PEO5	Ability to have knowledge of BLS & ACLS and ability to deliver it whenever required.
PEO6	Able to detect any Changes in patient's physiological status & able to tackle all types of Complications.
PEO7	Learn and Understand different Anesthetic & Surgical Procedures & their benefits as well as complications.
PEO8	Ability to Assist the Surgeon throughout Surgery & other important procedures.

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PROGRAM OUTCOMES: At the end of the program, the student will be able to:

PO1	Have a lifelong knowledge of Anaesthesia, Surgery & all the Equipments used in it along with basic knowledge of applied science.
PO2	Anaesthesia & Surgical Technicians/Assistants will work in Operation Theatres, ICUs etc. along with Anesthetists and Surgeons & thus will be having a great & Important role in Healthcare.
PO3	After completion students can go for higher studies such as Masters in same stream or any other relevant streams as well.
PO4	This Program will build technical knowledge in the student so that he/she will be able to assist an Anesthetist/Surgeon in every aspect of Anaesthesia, Surgery & other related fields.
PO5	Engage in lifelong learning and adapt to changing professional and societal needs.
PO6	This Program can do an overall development of the student to be able to have all the technical aspects about Anaesthesia, Surgery along with their advanced knowledge.

PROGRAM SPECIFIC OUTCOMES:
At the end of the program,

PSO1	Students will be competent to work in Hospital Operation Theatres, Critical Care Units and Emergency sections.
PSO2	Students will be skilled in problem solving, critical thinking and will be able to assist the Surgeon or Anesthetist.
PSO3	The students will acquire in-depth knowledge of Anesthesia, Surgery, Critical care and pain Management.
PSO4	Students will be able to have all the relevant knowledge of Anesthesia & Surgery and will be able to do various procedures required.
PSO5	This Program will create a great source of manpower which can aid in our health sector especially in Trauma, Emergency, ICU & Operation Theatres.
PSO6	Students will be able to explore new areas of research in both Anesthesia & Surgery and can also go for higher studies.

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PSO7	Students will be able to integrate knowledge of various types of Surgical Procedures & Anesthetic procedures along with their in-depth knowledge.

Bachelors of Science in Medical Technology - Anesthesia & Operation Theatre Technology (B.Sc. AOTT):
It is an Under Graduate (UG) Programme of 3 years duration (6 semesters)
Eligibility for Admission: 10+2 with Physics, Chemistry & Biology as main subjects.

Courses & Examination Scheme:

Semester		**First (1st)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 101-21	Core Theory	Human Anatomy & Physiology-I	3	1	0	40	60	100	4
BAOTT 102-21	Core Theory	Basic Anesthesia Technology	3	1	0	40	60	100	4
BAOTT 103-21	Core Theory	General Microbiology	3	1	0	40	60	100	4
BAOTT 104-21	Core Practical/Laboratory	Human Anatomy & Physiology-I Laboratory	0	0	4	60	40	100	2
BAOTT 105-21	Core Practical/Laboratory	Basic Anesthesia Technology Laboratory	0	0	4	60	40	100	2
BAOTT 106-21	Core Practical/Laboratory	General Microbiology Laboratory	0	0	4	60	40	100	2
BTHU 103-18	Ability Enhancement Compulsory Course (AECC)-I	English	1	0	0	40	60	100	1
BTHU 104-18	Ability Enhancement Compulsory Course (AECC)	English Practical/Laboratory	0	0	2	30	20	50	1
HVPE 101-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules	3	0	0	40	60	100	3
HVPE 102-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules (Lab/ Seminar)	0	0	1	25	--**	25	1
	TOTAL		**13**	**03**	**15**	**435**	**440**	**875**	**24**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

**The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional Development course will have internal evaluation only.

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Semester		**Second (2nd)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 201-21	Core Theory	Human Anatomy & Physiology-II	3	1	0	40	60	100	4
BAOTT 202-21	Core Theory	Surgical Equipments & Technology	3	1	0	40	60	100	4
BAOTT 203-21	Core Theory	Biochemistry & Pathology	3	1	0	40	60	100	4
BAOTT 204-21	Core Practical/Laboratory	Human Anatomy & Physiology-II Laboratory	0	0	4	60	40	100	2
BAOTT 205-21	Core Practical/Laboratory	Surgical Equipments & Technology Laboratory	0	0	4	60	40	100	2
BAOTT 206-21	Core Practical/Laboratory	Biochemistry & Pathology Laboratory	0	0	4	60	40	100	2
EVS 102-18	Ability Enhancement Compulsory Course (AECC) -III	Environmental Science	2	0	0	40	60	100	2
BMPD 202-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**11**	**03**	**13**	**365**	**360**	**725**	**21**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

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Semester		**Third (3rd)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 301-21	Core Theory	General Anesthesia	3	1	0	40	60	100	4
BAOTT 302-21	Core Theory	General Pharmacology	3	1	0	40	60	100	4
BAOTT 303-21	Core Theory	Surgical Instrumentation	3	1	0	40	60	100	4
BAOTT 304-21	Core Practical/Laboratory	General Anesthesia Laboratory	0	0	4	60	40	100	2
BAOTT 305-21	Core Practical/Laboratory	General Pharmacology Laboratory	0	0	4	60	40	100	2
BAOTT 306-21	Core Practical/Laboratory	Surgical Instrumentation Laboratory	0	0	4	60	40	100	2
BAOTT 307-21	Skill Enhancement Course-I	Introduction to Quality & Patient Safety	2	1	0	40	60	100	3
	TOTAL		**11**	**04**	**12**	**340**	**360**	**700**	**21**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

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Semester		**Fourth (4th)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 401-21	Core Theory	Obstetrics & Gynaecology	3	1	0	40	60	100	4
BAOTT 402-21	Core Theory	Surgical Procedures	3	1	0	40	60	100	4
BAOTT 403-21	Core Theory	Regional Anesthesia Techniques	3	1	0	40	60	100	4
BAOTT 404-21	Core Practical/Laboratory	Obstetrics & Gynaecology Laboratory	0	0	4	60	40	100	2
BAOTT 405-21	Core Practical/Laboratory	Surgical Procedures Laboratory	0	0	4	60	40	100	2
BAOTT 406-21	Core Practical/Laboratory	Regional Anesthesia Techniques Laboratory	0	0	4	60	40	100	2
BAOTT 407-21	Skill Enhancement Course-II	Basic in Computers and Information Science	2	1	0	40	60	100	3
BAOTT 408-21	Skill Enhancement Course-Laboratory	Basic in Computers and Information Science Practical	0	0	2	60	40	100	1
	TOTAL		**11**	**04**	**14**	**400**	**400**	**800**	**2 2**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

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EXAMINATION AND EVALUATION

THEORY			
S.No.		Weightage in Marks	Remarks
1	Mid-Semester Examination	24	MSTs, Quizzes, assignments, attendance, etc. Constitute internal evaluation. Average of two mid- semester exams will be considered for evaluation
2	Attendance	6	
3	Assignments	10	
4	End-Semester Examination	60	Conduct and checking of the answer sheets will be at the department level in case of university teaching department of Autonomous institutions. For affiliated colleges examination will be conducted at the university level
	Total	**100**	
PRACTICAL			
1	Daily evaluation of practical performance/ record/ viva Voce	30	Internal Evaluation
2	Attendance	5	
3	Internal Practical Examination	25	
4	Final Practical Examination	40	External Evaluation
	Total	**100**	

PATTERN OF END-SEMESTER EXAMINATION

I. **Part A** will be One Compulsory question consisting of short answer type questions [Q No. 1(a-j)] covering whole syllabus. There will be no choice in this question. It will be of 20 marks comprising of **10 questions of 2 marks each**.

II. **Part B** will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 30 marks with **6 questions of 5 marks each**.

III. **Part C** will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with **2 questions of 10 marks each**.

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SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

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SEMESTER-I

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Semester		First (1st)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 101-21	Core Theory	Human Anatomy & Physiology-I	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Know about different anatomical structures of Human Body
CO2: Knowledge about Cellular & Tissue level organization.
CO3: Understanding about Skeletal system & Bones.
CO4: Knowledge about Neurons & Nervous System.
CO5: To study about Endocrine System & Hormones.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	1	1	2	3
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	2	4	3	3	2	3

Detailed Syllabus:

Unit 1: - (CO1,CO2) [12 Hours]

Introduction to human body: Definition and scope of anatomy and physiology, levels of structural organization and body systems, basic life processes, homeostasis, basic anatomical terminology.

Cellular level of organization: Structure and functions of cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, intracellular signaling pathway activation by extracellular signal molecule, Forms of intracellular signaling: a) Contact-dependent b) Paracrine c) Synaptic d) Endocrine.

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Unit 2: - [12 Hours]

Tissue level of organization: Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.

Integumentary System : Structures and functions of skin

Skeletal system: Divisions of skeletal system, types of bone, salient features and functions of bones of axial and appendicular skeletal system. Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction.

(CO2,CO3)
Joints: Structural and functional classification, types of joints movements and its articulation.

Unit 3: - [12 Hours]
(CO4)

Nervous system: Organization of nervous system, neuron, neuroglia, classification and properties of nerve fiber, electrophysiology, action potential, nerve impulse, receptors, synapse, neurotransmitters.
Central nervous system: Meninges, ventricles of brain and cerebrospinal fluid, structure and functions of brain (cerebrum, brain stem and cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity)
Peripheral nervous system: Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves.

Unit 4: - [10 Hours] (CO5)

Special senses: Structure and functions of eye, ear, nose and tongue and their disorders.
Endocrine system : Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus and their disorders.

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Suggested Books: -

1. Ross & Wilson Anatomy and Physiology by Anne Waugh, Allison Grant published by Churchill Livingstone.
2. Principles of Anatomy & Physiology by Tortora & Bryan ,WILEY.

Semester		**First (1st)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 104-21	Core Theory	Human Anatomy & Physiology-I Laboratory	0	0	40	60	40	100	2

List of Experiment

Task 1: Identification of Various Organs in the human Body:- Liver, Heart, Kidney, Nephron, Lungs, Neuron, Ovary.
Task 2: Demonstration of various parts of body
Task 3: Estimation of blood pressure, cardiac cycle and respiration.
Task 4: Identification of blood cells and different counts.
Task 5: Hemoglobin percentage and color index.
Task 6: Blood groups.

Task 7: Artificial respiration and C.P.R

Task 8: Pulse rate, Heart rate and measurement of Blood Pressure.

Lab Outcome:

The student will be able to:

CO1: Know about different anatomical structures of Human Body
CO2: Knowledge about Blood, CPR, Pulmonary Function Test and other associated processes.
CO3: Examine about the Location of various organs of our body and their associated structures
CO4: Understanding the different functions that are going in a human body and all physiological actions.
CO5: Identification of various Organs of body & Their location.

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Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	1	1	2	3
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	2	4	3	3	2	3

Suggested Books: -

1. Ross & Wilson Anatomy and Physiology by Anne Waugh, Allison Grant published by Churchill Livingstone.
2. Principles of Anatomy & Physiology by Tortora & Bryan ,WILEY.

Semester		**First (1st)**						
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 102-21	Core Theory	Basic Anesthesia Technology	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

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CO1: Know About Basic Science of Anaesthesia
CO2: Understanding the Various Equipments involved in Anaesthesia
CO3: Examine the Anaesthesia Basics & Equipment Functioning
CO4: Know about various Drugs & Techniques used in Anaesthesia
CO5: Understand the working & use of Boyle's Apparatus & Other Equipments in Daily Anaesthetic Use.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Detailed Syllabus:

Unit 1: - [12 Hours]
(CO1,CO2)

Preanesthetic Checkup (PAC)-History, pre-operative, Intra operative & post-operative care.

Anaesthesia techniques

Historical background, Types of Anaesthesia, Choice of Anaesthesia, General Anaesthesia-Indication of general anesthesia ,Endotracheal intubations General Anesthesia Techniques ,Local Anaesthesia Techniques , Blood Transfusion, Monitoring in the Operation Theatre, Positioning of Patient.

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Unit 2: - [12 Hours] (CO2)

Anaesthesia Instrument

Anaesthesia Instrument planning for various surgical procedure and Auxiliary instrumentation, Boyle's apparatus, face mask, types of circuits, T-piece, Circle system

Supply of compressed gases, liquid oxygen, storage & supply system, reducing pressure valves, Vaporizers. Intubation equipment

Artificial airways (oral and Nasal endotracheal tubes, Tracheostomy tubes)

Parts of airway and features, Types, sizes and methods of insertion, Indications for use Care of long-term airways and complications.

Unit 3: - [11 Hours] (CO3)

Monitoring devices (ECG pads, oximeters, etc.)

Labor analgesics -Technical terms used

Methods of Pain Control- Patient Controlled Analgesia, Multimodal Technique, Epidural Analgesia.

Manual Resuscitators: Types of resuscitator bags

Methods of increasing oxygen delivery capabilities while using oxygen with resuscitator bags.

Recent advances in CPR, BLS

Unit 4: - [11 Hours] (CO4)

Suction apparatus- foot operated, electrically operated AMBU bag & laryngoscope,

Endotracheal tubes, Catheters, Face masks – Types, sizes and its usage, Venturi masks

Anaesthesia Ventilators & Monitoring.

Spinal Anesthesia- techniques & agents.

Epidural Anesthesia- techniques & agents

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Suggested Books: -

1. G. Smith & A.R. Aitkenhead's, Textbook of Anaesthesia, ELSEVIER.
2. Ajay Yadav's , Short textbook of Anesthesia, JP Brothers.
3. Anshul Jain, Essentials of Anesthesia & Critical Care, JAYPEE.
4. Arun Kumar Paul, Drugs & Equipments in Anaesthetic Practice, Elsevier.

Semester		**First (1st)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 105-21	Core Practical/Laboratory	Basic Anesthesia Technology Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Observation & Demonstration of Preparation of Anaesthetic equipments.

Task 2: Anesthesia Machine.

Task 3: Laryngoscope

Task 4: ET Tubes

Task 5: Face Masks

Task 6: AMBU Bag

Task 7: Spinal & Epidural Needles

Task 8: Anesthesia techniques.

Lab Outcome:

The student will be able to:

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CO1: Know About Basic Science of Anaesthesia
CO2: Understanding the Various Equipments involved in Anaesthesia
CO3: Examine the Anaesthesia Basics & Equipment Functioning
CO4: Know about various Drugs & Techniques used in Anaesthesia
CO5: Understand the working & use of Boyle's Apparatus & Other Equipments in Daily Anaesthetic Use

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Suggested Books: -

1. G. Smith & A.R. Aitkenhead's, Textbook of Anaesthesia, ELSEVIER.
2. Ajay Yadav's , Short textbook of Anesthesia, JP Brothers.
3. Anshul Jain, Essentials of Anesthesia & Critical Care, JAYPEE.
4. Arun Kumar Paul, Drugs & Equipments in Anaesthetic Practice, Elsevier.

Semester		**First (1st)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 103-21	Core Theory	General Microbiology	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Introduction about Microscopes, Microscopy & Microbiology.
CO2: Study about Nutrition & Growth of bacteria in a media.
CO3: Study about Culture media, Disinfectants & Antiseptics.

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CO4: Study about Sterilization & various methods of Sterilization.
CO5: Knowledge about Collection and Transportation of Specimens, Disposal of Laboratory/ Hospital Waste.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	4	3	2	4	3	3
CO2	2	3	3	1	1	2	3
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	4	3	4	2	2	3

Detailed Syllabus:

Unit 1: - [12 Hours] (CO1)

Introduction to microbiology & microscopy:
Brief history of microbiology.
Morphology of bacteria: anatomy of a bacterial cell including spores, flagella and capsules. Characteristics of bacteria and fungi.
Introduction, history and types of microscopes.
Structure and working of simple and compound microscope.
Principles of dark field, fluorescent, phase contrast and electron microscope.
Hospital acquired infections. Definition, types, routes of infections. Air and water bacteriology. Hand washing and scrubbing. Importance and methods. Role of Operation theatre Technologist in reducing hospital acquired infections.

Unit 2: - [12 Hours] (CO2)

Nutrition and Growth of Bacteria: Nutritional Requirements and Preparation of Culture Media, Bacteria Cell Division, Growth Phase, Batch and Continuous Culture, Growth of Aerobic and Anaerobic Bacteria.

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Culture media: Introduction, classification of culture media (solid media, liquid media, semisolid, Media, simple media, complex media, synthetic/defined media, routine culture media, basal media, enriched, enrichment, Selective, Indicator/differential media, sugar fermentation media, transport media, preservation media, aerobic media, and anaerobic media).

Unit 3: - [11 Hours] (CO3,CO4)

Antiseptics and disinfectants: Definition, classification, properties, mode of action and uses of various disinfectants. Factors affecting disinfectants. Precautions while using the disinfectants**.**

Sterilization: Principles and Methods of sterilization**,** Physical (Heat, Temperature, Radiation, Filtration) and Chemical Agents (Alcohol, Aldehyde, Halogens, Phenols, Gases) to Control Growth of Microbes

Unit 4: - [10 Hours] (CO5)

Collection and Transportation of Specimens, Disposal of Laboratory/ Hospital Waste: General Principles, Collection, Transportation (Urine, Feces, Sputum, Pus, Body Fluids, Swab and Blood), Non- Infectious Waste, Infected Sharp Waste Disposal, Infected Non- Sharp Waste Disposal.

Suggested Books: -

1. Panikar & Satish Gupta, Medical Microbiology, University Press
2. D.R Arora& B. Arora, Text Book of Microbiology, CBS Publishers
3. Anantha Narayan and Panikar , Text Book of Microbiology, University Press
4. Michael J. Pelozar, JR. E.C.S Chan & Noel R. Krieg, Text Book of Microbiology, Tata Mc Graw Hill.

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Semester		First (1st)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 106-21	Core Practical/Laboratory	General Microbiology Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Use of microscope in the study of bacteria.

Task 2: Culture media and its use in diagnostic bacteriology.

Task 3: Sterilization- Methods & advantages.

Task 4: Immunity, vaccines, types of vaccines and immunization schedule

Task 5: Principles and interpretation of common serological tests namely Widal, VDRL, ASLO, CRP, and Rheumatoid Factor. Rapid tests for HIV, HCV and HBsAg (excluding technical details).

Lab Outcome:

The student will be able to:

CO1: Introduction about Microscopes, Microscopy & Microbiology.
CO2: Demonstration of different methods of Sterilization.

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CO3: Study about Culture media, Disinfectants & Antiseptics.
CO4: Study about Vaccines & their types.
CO5: Knowledge about common Serological tests.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	4	3	2	4	3	3
CO2	2	3	3	1	1	2	3
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	4	3	4	2	2	3

Suggested Books: -

1. Panikar & Satish Gupta, Medical Microbiology, University Press
2. D.R Arora& B. Arora, Text Book of Microbiology, CBS Publishers
3. Anantha Narayan and Panikar , Text Book of Microbiology, University Press
4. Michael J. Pelozar, JR. E.C.S Chan & Noel R. Krieg, Text Book of Microbiology, Tata Mc Graw Hill.

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Semester		First (1st)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BTHU 103-18	Ability Enhancement Compulsory Course (AECC)-I	English	1	0	0	40	60	100	1

Detailed Syllabus:

Unit 1: - [8 Hours]

Theory of Communication

Types and modes of Communication

Unit 2: - [12 Hours]

Language of Communication

Verbal and Non-verbal (Spoken & verbal), Personal, Social and Business

Barriers and Strategies, Intra-personal, Inter-personal and Group communication

Unit 3: - [12 Hours]

Reading and Understanding

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Close Reading, Comprehension, Summary Paraphrasing, Analysis and Interpretation, Translation(from Hindi/Punjabi to English and vice-versa), Literary/Knowledge Texts

Unit 4: - [10 Hours]

Documenting, Report Writing, Making Notes, Letter Writing

Suggested Books: -

Bramhall, E. (2014). Effective communication skills in nursing practice.*Nursing Standard (2014+)*, *29*(14), 53.
Wilkie, H. (2001). *Writing, Speaking, Listening: The Essentials of Business Communication*. How to books Ltd.
Austin, D. (1976). *English for nurses*.NiraliPrakashan.
Grammar, N. D. E. Reading and Writing Skills by AL Kohli (Course A and course B).
Thomson, A. J., & Martinet, A. V. (1986).*Practical English grammar*.Oxford university press.

Semester		**First (1st)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BTHU 104-18	Ability Enhancement Compulsory Course (AECC)	English Practical/Laboratory	0	0	2	30	20	50	1

List of Experiment

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Interactive practice sessions in Language Lab on Oral Communication

Task 1: Listening Comprehension

Task 2: Self Introduction, Group Discussion and Role Play

Task 3: Common Everyday Situations: Conversations and Dialogues Communication at Workplace

Task 4: Interviews, Formal Presentations, Effective Communication/ Mis-communication, Public Speaking

Suggested Books: -

Bramhall, E. (2014). Effective communication skills in nursing practice.*Nursing Standard (2014+)*, *29*(14), 53.
Wilkie, H. (2001). *Writing, Speaking, Listening: The Essentials of Business Communication*. How to books Ltd.
Austin, D. (1976). *English for nurses*.NiraliPrakashan.
Grammar, N. D. E. Reading and Writing Skills by AL Kohli (Course A and course B).
Thomson, A. J., & Martinet, A. V. (1986).*Practical English grammar*.Oxford university press

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Semester		First (1st)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
HVPE 101-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules	3	0	0	40	60	100	3

Detailed Syllabus:

Unit 1: - [8 Hours]

Course Introduction - Need, Basic Guidelines, Content and 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 Aspirations

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 in harmony at various levels

Unit 2: - [12 Hours]

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Understanding Harmony in the Human Being - Harmony in Myself!

Understanding human being as a co-existence of the sentient 'I' and the material 'Body'

Understanding the needs of Self ('I') and 'Body' - *Sukh* and *Suvidha*

Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)

Understanding the characteristics and activities of 'I' and harmony in 'I'

Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail.

Programs to ensure *Sanyam* and *Swasthya*

Practice Exercises and Case Studies will be taken up in Practice Sessions

Unit 3: - [10 Hours]

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; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas)* and Respect (*Samman)* as the foundational values of relationship.

Understanding the meaning of *Vishwas*; Difference between intention and competence.

Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship.

Understanding the harmony in the society (society being an extension of family): *Samadhan, Samridhi, Abhay, Sah-astitva* as comprehensive Human Goals.

Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj),* Universal Order (*SarvabhaumVyawastha)*- from family to world family!

Practice Exercises and Case Studies will be taken up in Practice Sessions

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Unit 4: - [8 Hours]

Understanding Harmony in the Nature and Existence - Whole existence as Co-existence

Understanding the harmony in the Nature.

Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature.

Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space.

Holistic perception of harmony at all levels of existence.

Practice Exercises and Case Studies will be taken up in Practice Sessions.

Unit 5: - [12 Hours]

Implications of the above Holistic Understanding of Harmony on Professional

Natural acceptance of human values, Definitiveness of Ethical Human Conduct.

Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order.

Competence in professional ethics: Ability to utilize the professional competence for augmenting universal human order, Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems, Ability to identify and develop appropriate technologies and management patterns for above production systems.

Case studies of typical holistic technologies, management models and production systems.

Strategy for transition from the present state to Universal Human Order:

At the level of individual: as socially and ecologically responsible engineers, technologists and managers

b) At the level of society: as mutually enriching institutions and organizations

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Suggested Books: -

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
2. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
3. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
5. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Purblishers.
6. A.N. Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.
9. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers , Oxford University Press
10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd

Semester		**First (1st)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
HVPE 102-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules (Lab/ Seminar)	0	0	1	25	--**	25	1

List of Experiment

One each seminar will be organized on Drug De-addiction and Traffic Rules. Eminent scholar and experts of the subject will be called for the Seminar atleast once during the semester. It will be binding for all the students to attend the seminar

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Suggested Books: -

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
2. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
3. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
5. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Purblishers.
6. A.N. Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.
9. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers , Oxford University Press
10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd

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SEMESTER-II

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Semester		Second (2nd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 201-21	Core Theory	Human Anatomy & Physiology-II	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Know about different anatomical structures of Human Body.
CO2: Study about Digestive system & various organs involved in it.
CO3: Knowledge about Urinary System & functioning of Kidney.
CO4: Study about Circulatory & Respiratory system & also about reproductive & Lymphatic system.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	1	1	2	3
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2

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Detailed Syllabus:

Unit 1: - [12 Hours] (CO1,CO3)

Alimentary system: mechanism and physiology of digestion and absorption structure &function (Mouth, Tongue, Teeth, Oesophagus, Pharynx, Stomach, Intestine, Rectum, Anus;
Digestive glands; physiology of digestion of carbohydrates, lipids& proteins,
Structure and function of Liver.
Urinary system: Main parts, Structure & function of kidney, structure of nephron, physiology of excretion & urine formation, urine, additional excretory organs.

Unit 2: - [12 Hours] (CO4)

Circulatory system: Composition and functions of blood, anatomy and physiology of Heart**,** circulation of blood,
Cardiac cycle and conducting system of Heart**,** the blood pressure, arteries and veins
Respiratory system-Organs of respiration and their histology, Respiration (definition and mechanism),
Gas exchange in the lungs, Regulation of respiration, Basal metabolic rate.
Pleural Cavity & intrapleural pressure.

Unit 3: - [11 Hours] (CO4)

Reproductive system-Male and female reproductive system, Histology of gonads,
The ovarian cycle and ovulation,
Fertilization, spermatogenesis.
Lymphatic system- Introduction, Structure and function, Lymph nodes, Spleen, Thymus gland, Tonsils.

Unit 4: - [10 Hours] (CO2)

Body fluids and their significance: Important terms, types of body fluid, total body water, avenues by which water leaves and enters body, general

principles for fluid balance, cardinal principle, how body fluids maintain Homeostasis, Electrolytes & ions Function of electrolytes, how electrolyte imbalance leads to fluid imbalance.

Suggested Books: -

1. Ross & Wilson Anatomy and Physiology, Anne Waugh, Allison Grant, Churchill Livingstone
2. Principles of Anatomy & Physiology, Tortora & Bryan, WILEY

Semester		Second (2nd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 204-21	Core Practical/Laboratory	Human Anatomy & Physiology-II Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Identification of axial bones

Task 2: Identification of appendicular bones.

Task 3: To study the special senses using specimen,

Task 4: To study the nervous system using specimen, models, etc

Task 5: To study the endocrine system using specimen, models, etc.

Task 6 : Recording of body temperature.

Task 7 : To demonstrate positive and negative feedback mechanism.

Task 8: Determination of bleeding time

Task 9: Determination of clotting time.

Lab Outcome:

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The student will be able to:

CO1: Know about different anatomical structures of Human Body
CO2: Understanding about various Organs which are responsible for controlling our body functions
CO3: Examine about the Location of various organs of our body and their associated structures
CO4: Understanding the different functions that are going in a human body and all physiological actions.
CO5: Identification of various Organs of body & Their location.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	1	1	2	3
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	2	4	3	3	2	3

Suggested Books: -

1. Ross & Wilson Anatomy and Physiology, Anne Waugh, Allison Grant, Churchill Livingstone
2. Principles of Anatomy & Physiology, Tortora & Bryan, WILEY.

Semester		Second (2nd)				
Course	Course Type	Course Title	Load Allocations	Marks Distribution	Total	Credits

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Code			L*	T*	P	Internal	External	Marks	
BAOTT 202-21	Core Theory	Surgical Equipments & Technology	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Know About Basic Science of Surgery.
CO2: Understanding the Various Equipments & Instruments involved in Surgery.
CO3: Examine the Surgical instrument & Equipment Functioning.
CO4: Know about various Positions used in Surgical Procedures.
CO5: Understand the process of sterilization & its types.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Detailed Syllabus:

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Unit 1: - **[12 Hours] (CO1,CO5)**

Sterilization & disinfections, Methods of Sterilization- Physical & Chemical, New Methods of Sterilization,Principles of autoclaving, Fumigation of O.T.
General surgical, principles & instruments.

The surgical patient, operation room techniques Instruments used for preparing surgical instruments trolley- cheatles forceps, rampley's sponge holding forceps, mayo's towel clip, Esmarch's bandage, tourniquet, pneumatic tourniquet.

Unit 2: - **[12 Hours] (CO2)**

Incision making method & Instruments-bard parker knife handle, major abdominal incision,

Classification of Instruments.

Artery forceps & their types, Kocher's forceps, tissue forceps, electric cautery.

Retractions- single hook retractors, Cat paw retractor, Czerny's retractor, nerve hook retractor, Morris retractors, Devers retractors, Doyen's Retractor. Self-retaining retractors.

Unit 3: - **[11 Hours] (CO3)**

Wound management & closure:

Scissors & its types, disinfectants, dressing procedure, different types of bandages, surgical needle & needle holders, types of suture materials. Types of suturing.

Modern wound closing techniques – Adhesive tape, Glue, Staples etc.

Unit 4: - **[10 Hours] (CO4)**

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Suction apparatus in surgery, Surgical instruments used for Surgery, Positioning of patient for surgery- Supine, Trendelenburg, Anti-Trendelenburg, Lateral, Prone, Sitting. Common surgical procedures in surgery, I/V fluid administration.

Suggested Books: -

1. Ajay Yadav and Arora, Anne Waugh, Synopsis of medical instruments, Jaypee .
2. Raymond Maurice Kirk, Basic Surgical Techniques, ELSEVIOR
3. Alexis Thomson, Alexander Miles, Manual of Surgery, Morrison and Gibb.
4. Ajay kumar Agarwal and neelabhaarwal, Surgical instruments, Jaypee .

Semester		**Second (2nd)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 205-21	Core Practical/Laboratory	Surgical Equipments & Technology Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Observation & Demonstration of Preparation of Surgical equipments.

Task 2: Working of Fumigator.

Task 3: General Surgical Instruments

Task 4: Electro-cautery

Task 5: Suture Materials

Task 6 : Suturing Techniques

Task 7 : Surgical Positioning

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.**Task 8:** IV Fluids

Lab Outcome:

The student will be able to:

CO1: Know About Basic Science of Surgery.
CO2: Understanding the Various Equipments & Instruments involved in Surgery.
CO3: Examine the Surgical instrument & Equipment Functioning.
CO4: Know about various Positions used in Surgical Procedures.
CO5: Understand the process of sterilization & its types

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Suggested Books: -

1. Ajay Yadav and Arora, Anne Waugh, Synopsis of medical instruments, Jaypee .
2. Raymond Maurice Kirk, Basic Surgical Techniques, ELSEVIOR
3. Alexis Thomson, Alexander Miles, Manual of Surgery, Morrison and Gibb.
4. Ajay kumar Agarwal and neelabhaarwal, Surgical instruments, Jaypee

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Semester		Second (2nd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 203-21	Core Theory	Biochemistry & Pathology	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Introduction about different organic compounds/ Nutrients.
CO2: Study about metabolism of carbohydrates and other nutrients.
CO3: Study about Renal & Liver Function Tests.
CO4: Study about Immunology & cell injury.
CO5: Knowledge about Disorders, infections & various diseases

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	4	3	2	4	3	3
CO2	2	3	3	1	1	2	3
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	4	3	4	2	2	3

Detailed Syllabus:

Unit 1: - [12 Hours] (CO1)

Nomenclature of compounds containing halogen, alcohols and phenols. Ethane, Propane, Ether, aldehydes, Ketones, Carboxylic acid, Cyanides Isocyanides, Nitrogen compounds and amines.

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Nature of radiation and radioactive substances. Catalysis, Amino-acids, peptides, proteins and enzymes.

Haemoglobin, blood and respiration 6. Vitamins and hormones 7. Carbohydrate metabolism 8. Brief knowledge about "Disturbances of carbohydrate metabolism, glucose tolerance test, diabetic ketosis, insulin tolerance, abnormal sugar in urine".

Unit 2: - [12 Hours] (CO2,CO3)

Protein metabolism, Disturbances of protein and nitrogen metabolism Fat metabolism, its disorders, ketosis and high plasma cortisol.
Disorders of liver and bilirubin metabolism, plasma bilirubin.Liver function test.
Calcium, phosphorous, sodium and potassium in the body, their significance and general precautions. Renal function tests. Disturbance in water and sodium metabolism.
Acid-base equilibrium. Blood gases

Unit 3: - [11 Hours] (CO4)

Cellular adaptation, Cell injury & cell death. Introduction to pathology
Overview: Cellular response to stress and noxious stimuli.
Cellular adaptations of growth and differentiation
Overview of cell injury and cell death.
Causes of cell injury.Mechanisms of cell injury. Reversible and irreversible cell i njury.
Examples of cell injury and necrosis.
Inflammation. General features of inflammation Acute inflammation Chemical mediators of inflammation Chronic inflammation.

Unit 4: - [10 Hours] (CO5)

Immunity disorders. General features of the immune system
Disorders of the immune system Hyper sensitivity reaction – I, II, III, IV
Infectious diseases. General principles of microbial pathogenesis
Viral infections – HBV, HCV, HIV, CMV Bacterial infections Staphylococci, /streptococci, E.Coli, Salmonella, Tuberculosis. Fungal infections, Parasitic infections, TORCH infection.

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Suggested Books: -

1. U. Satyanarayan and U.Chakrapani, Biochemistry, Elsevier
2. M N Chatterjee and R. Shinde, Text book of Medical Biochemistry, Jaypee Brothers.
3. Harshmohan, Textbook of Pathology,7th edition, Jaypee Publications.
4. Robbins, Text book of Pathology, 3rd edition, Elsevier Publications.

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Semester		Second (2nd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 206-21	Core Practical/Laboratory	Biochemistry & Pathology Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Carbohydrate Metabolism.

Task 2: Protein Metabolism

Task 3: Fat metabolism

Task 4: Disorders in metabolism

Task 5: Cell Injury demonstration.

Task 6: Immunity & types.

Task 7: Infections & types Suture Materials

Lab Outcome:

The student will be able to:

CO1: Introduction about different organic compounds/ Nutrients.
CO2: Study about metabolism of carbohydrates and other nutrients.
CO3: Study about Renal & Liver Function Tests.
CO4: Study about Immunology & cell injury.
CO5: Knowledge about Disorders, infections & various diseases

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7

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CO1	3	4	3	2	4	3	3
CO2	2	3	3	1	1	2	3
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	4	3	4	2	2	3

Suggested Books: -

1. U. Satyanarayan and U.Chakrapani, Biochemistry, Elsevier
2. M N Chatterjee and R. Shinde, Text book of Medical Biochemistry, Jaypee Brothers.
3. Harshmohan, Textbook of Pathology,7th edition, Jaypee Publications.
4. Robbins, Text book of Pathology, 3rd edition, Elsevier Publications.

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Semester		Second (2nd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
EVS 102-18	Ability Enhancement Compulsory Course (AECC) -III	Environmental Science	2	0	0	40	60	100	2

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Explain scope and importance of multidisciplinary nature of environment

CO2: Classify Natural Resources and associated problems.

CO3: Gain knowledge of use and over exploitation, case studies of forest resources and water resources.

CO4: Learn concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers

CO5: Relate Causes, effects and control measures of air pollution

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Detailed Syllabus:

Unit 1: - [10 Hours] (CO1,CO4)

Introduction to Environmental Studies Multidisciplinary nature of Environmental Studies: Scope & Importance Need for Public Awareness

Ecosystems Concept of an Ecosystem: Structure & functions of an ecosystem (Producers, Consumers & Decomposers) Energy Flow in an ecosystem: Food Chain, Food web and Ecological Pyramids Characteristic features, structure & functions of following Ecosystems: • Forest Ecosystem • Aquatic Ecosystem (Ponds, Lakes, River & Ocean)

Unit 2: - [14 Hours] (CO2,CO3)

Natural Resources Renewable & Non-renewable resources Forest Resources: Their uses, functions & values (Biodiversity conservation, role in climate change, medicines) & threats (Overexploitation, Deforestation, Timber extraction, Agriculture Pressure), Forest Conservation Act Water Resources: Their uses (Agriculture, Domestic & Industrial), functions & values, Overexploitation and Pollution of Ground & Surface water resources (Case study of Punjab), Water Conservation, Rainwater Harvesting, Land Resources: Land as a resource; Land degradation, soil erosion and desertification.

Energy Resources: Renewable & non-renewable energy resources, use of alternate energy resources (Solar, Wind, Biomass, Thermal), Urban problems related to Energy

Unit 3: - [12 Hours] (CO3)

Biodiversity & its conservation Types of Biodiversity: Species, Genetic & Ecosystem India as a mega biodiversity nation, Biodiversity hot spots and biogeographic regions of India Examples of Endangered & Endemic species of India, Red data book

Environmental Pollution & Social Issues Types, Causes, Effects & Control of Air,

Water, Soil & Noise Pollution .Nuclear hazards and accidents & Health risks. Global Climate Change: Global warming, Ozone depletion, Acid rain, Melting of Glaciers & Ice caps, Rising sea levels Environmental disasters: Earthquakes, Floods, Cyclones, Landslides.

Unit 4: - [12 Hours] (CO5)

Field Work Visit to a National Park, Biosphere Reserve, Wildlife Sanctuary Documentation & preparation of a Biodiversity (flora & fauna) register of campus/river/forest Visit to a local polluted site : Urban/Rural/Industrial/Agricultural Identification & Photography of resident or migratory birds, insects (butterflies) Public hearing on environmental issues in a village

Suggested Books: -

1. Jadhav, H., & Bhosale, V. M. (1995). Environmental Protection and Laws, Himalaya Pub. *House, Delhi*.
2. O'riordan, T. (2014). *Environmental science for environmental management*. Routledge.
3. Mckinney, M. L., &SchocJ, R. M. (1996). Environmental Science systems & Solutions, Web enhanced edition. 639p. 13. *Mhaskar AK, Matter Hazardous, Techno-Science Publications (TB)*.
4. Miller, G. T., & Spoolman, S. (2015). *Environmental science*. Cengage Learning.

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Semester		Second (2nd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BMPD 202-18		Mentoring and Professional Development	0	0	1	25	--	25	1

List of Experiment

(Class Activities)

1. Expert and video lectures
2. Aptitude Test
3. Group Discussion
4. Quiz (General/Technical)
5. Presentations by the students
6. Team building Exercises

7* A part of above six points practicals on Fundamentals of Computers are also added as per Annexure-I

(Outdoor Activities)

1. Sports/NSS/NCC
2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.

Evaluation shall be based on rubrics for Part – A & B

Mentors/Faculty incharges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

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SEMESTER-III

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Semester		Third (3rd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 301-21	Core Theory	General Anesthesia	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Study About TRIAD of General Anaesthesia & Stages of GA.
CO2: Knowledge about various techniques used in General Anaesthesia.
CO3: Learn about various Drugs used in Anaesthesia & their dosages.
CO4: Study about Pre-Anaesthetic Preparation & Premedication in General Anaesthesia.
CO5: Knowledge about gases used in GA & Complications of General Anaesthesia.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

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Detailed Syllabus:

Unit 1: - [12 Hours] (CO1)

Introduction: General Anaesthesia- History, Components of General Anesthesia,
Triad of General Anaesthesia, Balanced Anaesthesia- Meaning & benefits,
Stages of General Anaesthesia (Guedel's Classification)- Surgical Anesthesia Stage,
Reflexes lost during each stage of General Anesthesia & use of this classification in current General Anesthesia Practice.

Unit 2: - [12 Hours] (CO2)

Indications of General Anaesthesia, Contraindications of General Anaesthesia.
Advantages & Disadvantages of General Anesthesia over Regional Anesthesia,
Techniques of General Anesthesia-TIVA & Sedation,
Preparations for General Anaesthesia- OT Preparation, Equipment Preparation & Patient Preparation.
Pre-Anesthesia Checkup (PAC) & various investigations done during PAC.
Role of Anesthesia & OT Assistant in Preparation for General Anesthesia.

Unit 3: - [11 Hours] (CO3,CO4)

Pre-Anesthetic medication- Goals, modifications & contraindications,
Pre-operative Fasting- Guidelines & advantages & management of a full stomach patient,
Special consideration in Pregnant patient for General Anesthesia. Patient Preparation and transport of patient to the OT.
Gases used in Anaesthesia**-** Oxygen, N_2O, Halothane, Isoflurane, Sevoflurane & Desflurane.

Unit 4: - [10 Hours] (CO5)

Intravenous Anesthetics- use, effects & dosage,

Muscle relaxants- use, effects & dosage, Analgesics- Uses in GA & complications
Reversal- use & effects with dosage.
Complications o General Anaesthesia- intraoperative, immediate, post-operative & delayed.
Post-operative care after anesthesia.

Suggested Books: -

1. G. Smith & A.R. Aitkenhead's, Textbook of Anaesthesia, Elsevier
2. Ajay Yadav, Short Text book of Anaesthesia, JP Brothers .
3. Anshul Jain, Essentials of Anesthesia & Critical Care, Jaypee .
4. Arun Kumar Paul, Drugs & Equipments in Anaesthetic Practice, Elsevier Publications.

Semester		**Third (3rd)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 304-21	Core Practical/Laboratory	General Anesthesia Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: General Anesthesia Techniques

Task 2: Preparation of Operation Theatre for General Anesthesia

Task 3: Pre-Anesthesia Preparation of Patient.

Task 4: Pre-oxygenation Technique.

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Task 5: Methods of giving Premedication & General Anesthesia Drugs.

Task 6: Stages of Anesthesia

Task 7: Preparation of Induction Agents

Task 8: Preparation of Muscle relaxants

Task 9: Preparation of Reversal

Task 10: Filling of Inhalational agents

Lab Outcome:

The student will be able to:

CO1: Study About TRIAD of General Anaesthesia & Stages of GA.
CO2: Knowledge about various techniques used in General Anaesthesia.
CO3: Learn about various Drugs used in Anaesthesia & their dosages.
CO4: Study about Pre-Anaesthetic Preparation & Premedication in General Anaesthesia.
CO5: Knowledge about gases used in GA & their filling.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Suggested Books: -

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1. G. Smith & A.R. Aitkenhead's, Textbook of Anaesthesia, Elsevier
2. Ajay Yadav, Short Text book of Anaesthesia, JP Brothers .
3. Anshul Jain, Essentials of Anesthesia & Critical Care, Jaypee .
4. Arun Kumar Paul, Drugs & Equipments in Anaesthetic Practice, Elsevier Publications.

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Semester		Third (3rd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 302-21	Core Theory	General Pharmacology	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Study about General Principles of Pharmacology & Routes of Drug Administration.
CO2: Study about Cardiovascular Drugs & their uses and Classification.
CO3: Study about Anaesthetic Agents, their classification uses and side-effects.
CO4: Study about Emergency Drugs, Analgesics & Anti-Allergic drugs.
CO5: Study about CNS Stimulants & Depressants, Corticosteroids & Diuretics.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

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Detailed Syllabus:

Unit 1: - [12 Hours] (CO1,CO2)

General Principles- Pharmacological classification of Drugs, Route of drug administration, and Precautions

Drug toxicity, prevention & treatment of poisoning adverse drug reaction

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

-Antihypertensive Drugs -Alpha Beta Adrenergic antagonists-Vasodilators -Calcium channel blockers -Antiarrhythmic drugs, Cardiac glycosides

Unit 2: - [12 Hours] (CO3,CO4)

Drugs used in Haemostasis - anticoagulants Thrombolytic and antithrombolytics.

-Drugs used in the treatment of shock.

Classification of general anaesthetics -Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents.

-Intravenous general anaesthetic agents. -Inhalational gases Emergency drugs.

-Local anaesthetics - classification mechanism of action, duration of action and methods to prolong the duration of action. Preparation, dose and routes of administration.

Unit 3: - [11 Hours] (CO5)

Definition and classification, Routes of administration, dose, frequency of administration, Side effects and management of non opioid and opioid analgesics. Antihistamines and antiemetics Classification, Mechanism of action, adverse effects, Preparations, dose and routes and administration.

Alcohol Sedatives, hypnotics and narcotics, CNS stimulants

Neuromuscular blocking agents and muscle relaxants

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Unit 4: - [10 Hours] (CO5)

Corticosteroids- Classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration. Diuretics Classification of Diuretics Action of diuretics Adverse effects Preparations, dose and routes of administration Chemotherapeutic drugs. Definition. Classification and mechanism of action of antimicrobial agents

Suggested Books: -

1. KD Tripathi , Text book of pharmacology, Jaypee Brothers
2. Tara Shanbhag, Smita Shenoy, . Text book of pharmacology, Elsevier

Semester		Third (3rd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 305-21	Core Practical/Laboratory	General Pharmacology Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Study of absorption and excretion of drugs in man

Task 2: Study of absorption and excretion of drugs in man

Task 3: Critical appraisal of drug advertisements

Task 4: Evaluation of analgesics by chemical method

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Task 5: Evaluation of side-effects of a drug

.

Task 6: Effects of CNS stimulants & Depressants

Task 7: Effects of Diuretics & mechanism of action

Task 8: Management of complications of various drugs

Lab Outcome:

The student will be able to:

CO1: Study about General Principles of Pharmacology & Routes of Drug Administration.
CO2: Study about Cardiovascular Drugs & their uses and Classification.
CO3: Study about Anaesthetic Agents, their classification uses and side-effects.
CO4: Study about Emergency Drugs, Analgesics & Anti-Allergic drugs.
CO5: Study about CNS Stimulants & Depressants, Corticosteroids & Diuretics.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Suggested Books: -

1. KD Tripathi , Text book of pharmacology, Jaypee Brothers
2. Tara Shanbhag, Smita Shenoy, . Text book of pharmacology, Elsevier

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Semester		Third (3rd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 303-21	Core Theory	Surgical Instrumentation	3	1	0	40	60	100	4

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Know about the fabrication & making of surgical instruments.
CO2: Study about the classification of surgical instruments.
CO3: Study about general, orthopedic, cardiac & neurosurgery instruments.
CO4: Study about endoscopic & laproscopic surgery instruments.
CO5: Knowledge about care & cleaning of surgical instruments.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Detailed Syllabus:

Unit 1: - [12 Hours] (CO1)

Fabrication of instruments, Types of surgical needles, Size of blades, Basic classification of instruments, Drains and its types. Incision making instruments, Hemostatic instruments.

Retractors- Hand-held & self-retaining, Dissecting Forceps, Scissors , Tissue holding forceps, Needle holders & miscellaneous instruments.

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Unit 2: - [12 Hours] (CO2)

General instruments, Biliary tract surgery instruments,Orthopedic and Plastic instruments,Bone cement, Artificial prosthetic implants.
Urology instruments ,Gynaecological examination instruments,Thyroid Surgical instruments, Bowel Surgical instruments, Powered surgical instruments. Electrocautery & Laser.

Unit 3: - [11 Hours] (CO3)

Organ procurement and transplantation surgery instruments,Types of transplants: Tissue transplantation, Organ transplantation
Instruments used in cardiac surgeries, Pacemakers and its types, ECMO machine.
Neurological instruments, Gamma knife radiosurgery

Unit 4: - [10 Hours] (CO4,CO5)

Endoscopes and its types, Robotic machine and its parts, Techniques used.
Thoracic surgery instruments. Laparoscopic tower and instruments.

Anorectal Surgeries, Care and Cleaning of Instruments

Suggested Books: -

1. Ajay Yadav and Arora , Synopsis of medical instruments , Jaypee
2. G.N Sharma & A.L Aggarwal, O.T Techniques and management, Medico refresher.
3. Alexis Thomson, Alexander Miles, Manual of Surgery, Morrison and Gibb.

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Semester		Third (3rd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 306-21	Core Practical/Laboratory	Surgical Instrumentation Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Fabrication of Surgical instruments

Task 2: Classification of surgical instruments

Task 3: General surgery instruments

Task 4: Surgical needles & suturing

Task 5: Instrument holding technique

Task 6: Drain types & uses

Task 7: Orthopedic surgery instruments

Task 8: Endoscopes & laparoscopes

Lab Outcome:

CO1: Know about the fabrication & making of surgical instruments.
CO2: Study about the classification of surgical instruments.
CO3: Study about general, orthopedic, cardiac & neurosurgery instruments.
CO4: Study about endoscopic & laparoscopic surgery instruments.
CO5: Knowledge about care & cleaning of surgical instruments.

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Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Suggested Books: -

1. Ajay Yadav and Arora , Synopsis of medical instruments , Jaypee
2. G.N Sharma & A.L Aggarwal, O.T Techniques and management, Medico refresher.
3. Alexis Thomson, Alexander Miles, Manual of Surgery, Morrison and Gibb.

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Semester		Third (3rd)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 307-21	Skill Enhancement Course-I	Introduction to Quality & Patient Safety	2	1	0	40	60	100	3

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Categorize quality improvement approaches, NABH, NABL, JCI guidelines which purely focus on the quality measures and proper handling of equipments.

CO2: Become acquainted with basic life support skills which can save many lives in Emergency cases

CO3: Assess proper management of biomedical waste, reducing risk of infection due to waste handling by personnel and preventing cross infection which can occur due to improper handling.

CO4: Learn about Radioactive waste, metals/chemicals/drug waste, BMW management and methods of disinfection, use of Personal protective equipment (PPE).

CO5: ExecuteFirstaid, choking, rescue breathing methods, ventilation including use of bag valve master (BVMs)

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

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Detailed Syllabus:

Unit 1: - [12 Hours] (CO1,CO2)

Quality assurance and Management

Introduction, Quality improvement approaches, standards and norms, quality improvement tools, introduction to NABH guidelines.

Basic of Emergency care and Life support skills

Basic life support (BLS) following cardiac arrest, recognition of sudden cardiac arrest and activation of emergency response system, early cardiopulmonary resuscitation (CPR) and rapid defibrillation with an automated external defibrillator (AED)

Unit 2: - [12 Hours] (CO2,CO3,CO4)

Basic emergency care

First aid, choking, rescue breathing methods, ventilation including use of bag valve master (BVMs)

Biomedical Waste Management

Definition, waste minimization, BMW-segregation, collection, transportation, treatment and disposal (Including color coding), Liquid BMW, Radioactive waste, metals/chemicals/drug waste, BMW management and methods of disinfection, use of Personal protective equipment (PPE)

Unit 3: - [11 Hours] (CO4)

Infection Prevention and Control

Sterilization, Disinfection, Effective hand hygiene, use of PPE, Prevention and control of common healthcare associated infections, Guidelines(NABH) and JCI for hospital infection control.

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Unit 4: - [10 Hours] (CO5)

Disaster preparedness and management

Fundamentals of emergency management

Suggested Books: -

Srinivasan, A. V. (Ed.). (2008). *Managing a modern hospital*. SAGE Publications India.

Estridge, B. H., & Reynolds, A. P. (2011).*Basic clinical laboratory techniques*.Cengage Learning.

Anderson, D. M., Anderson, L. E., &Glanze, W. D. (2002).*Mosby's medical dictionary* (Vol. 26, No. 43, p. 1866). St. Louis: Mosby.

Macpherson, G. (2002). *Black's medical dictionary*. A&C Black.

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SEMESTER-IV

Semester		Fourth (4th)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 401-21	Core Theory	Obstetrics & Gynaecology	3	1	0	40	60	100	4

Objective: The aim and objective of this course is to know about introduction of basic anatomy & physiology of Human body.

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Know About the Various Anatomical & Physiological Changes in Obstetrics & Gynaecology
CO2: Understand Various Anaesthesia Techniques used in Gynaecology & Obstetrics
CO3: Study about Various Surgeries Done in Gynaecology & Pediatrics
CO4: To Understand Various Equipments & Instruments Used in Gynaecology & Anaesthesia
CO5: Know about various Conditions in mother and fetus related to pregnancy

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	1	1	2	3
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	2	4	3	3	2	3

Detailed Syllabus:

Unit 1: - (CO1,CO2) **[12 Hours]**

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Anatomy & Physiology of female Reproductive organs, Gynecological examination.

OBSTETRICS

Amenorrhea, Physiology of Pregnancy, Normal delivery, forceps delivery, Twin pregnancy. Fetal Presentations. Ectopic pregnancy,
Complications related to pregnant women - Supine hypotension syndrome of pregnancy, Mendelson syndrome of pregnancy, Eclampsia/Pre-eclampsia, PPH.

Unit 2: - [12 Hours] (CO1,CO2)

Birth control methods & Procedures, Medical termination of pregnancy. Instruments & Techniques of MTP

GYNECOLOGY: Clinical methods in gynaecological examination Common diseases of vulva, vagina, Disorders of menstruation,Various operative positions.

Disorders of female reproductive system - endometriosis, myoma formation, tubal blockade, cyst formation, abnormal menstruation, STD's

Unit 3: - [11 Hours] (CO5)

Normal Labor: Normal labor and delivery, Intrapartum fetal monitoring, Induction of labor, Obstetric Analgesia and Anesthesia,

Abnormal Labor: Abnormal uterine action in labor, Abnormal labor patterns, prolonged labor, obstructed labor, Dystocia. Complications of the third stage of labor, Injuries to birth canal.

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Unit 4: - (CO3,CO4) [10 Hours]

Diagnostic procedures in gynae and obstructers - Culdoscopy, Hysteroscopy, Endometrial tissue biopsy,
Surgical procedures - Incisions given in gynae procedure, episiotomy, D&C, D&E, MTP, MRP, Caesarean section, tubal ligation, abdominal and vaginal hysterectomy, myomectomy, oophorectomy. Lap. Assisted vaginal hysterectomy, Tubectomy. Instruments used in gynae and obstetrics.

Suggested Books: -

1. Anne Waugh and Kathleen JW Wilson; Churchill LivingStone; London, Anatomy and Physiology, Ross and Wilson.
2. Holland & brews, Manual of obstetrics, Miscellaneous Publishers.
3. Dc Dutta's, Textbook of obstetrics Gynaecology, Jaypee Brothers Medical Publishers
4. Cs Dawn, Textbook of Gynaecology contraception & demography, Dawns Books

Semester		**Fourth (4th)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 404-21	Core Practical/Laboratory	Obstetrics & Gynaecology Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Identification of parts of Female Reproductive system.
Task 2: Gynecological Examination.
Task 3: Normal Delivery.
Task 4: LSCS.
Task 5: Manual Removal of Placenta

Task 6: Medical Termination of Pregnancy
Task 7: D & C
Task 8: Episiotomy
Task 9: Hysterectomy

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Task 10: Birth Control Methods

Lab Outcome:

CO1: Know about different anatomical structures of Human Body
CO2: Understanding about various Organs which are responsible for controlling our body functions
CO3: Examine about the Location of various organs of our body and their associated structures
CO4: Understanding the different functions that are going in a human body and all physiological actions.
CO5: Identification of various Organs of body & Their location.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	3	1	1	2	3
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	3	2	2	1	2
CO5	4	2	4	3	3	2	3

Suggested Books: -

1. Anne Waugh and Kathleen JW Wilson; Churchill LivingStone; London, Anatomy and Physiology, Ross and Wilson.
2. Holland & brews, Manual of obstetrics, Miscellaneous Publishers.
3. Dc Dutta's, Textbook of obstetrics Gynaecology, Jaypee Brothers Medical Publishers
4. Cs Dawn, Textbook of Gynaecology contraception & demography, Dawns Books

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Semester		Fourth (4th)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 402-21	Core Theory	Surgical Procedures	3	1	0	40	60	100	4

Objective: The aim and objective of this course is to know about various types of surgical procedures & their methods.

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Know About some Minor Surgical Procedures.
CO2: Understanding the Various Breast procedures.
CO3: Know about General surgery procedures.
CO4: Know about various gynae & obstetric procedures.
CO5: Know about various genitourinary & orthopedic procedures.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

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Detailed Syllabus:

Unit 1: - [12 Hours] (CO1,CO2)

Integumentary and Minimally Invasive Surgery:
Excision (or Destruction) of Skin Lesions, Muscle Biopsy, Excision of Subcutaneous Lipoma, Incision and Drainage of an Abscess, Percutaneous Insertion of Catheters,

Breast Surgery: Breast Biopsy, Mastectomy, Excision of Ganglion, Thyroidectomy, Parathyroidectomy.

Unit 2: - [12 Hours] (CO3)

Abdominal Extraintestinal Surgery: Abdominal Laparotomy, Abdominal Laparoscopy, Abdominal Herniorrhaphy, Cholecystectomy; Open & Laparoscopic, Pancreaticoduodenectomy (Whipple Procedure), Hepatic Resection, Splenectomy, Laparoscopic Splenectomy.

Gastrointestinal Surgery: Colonoscopy, Sigmoidoscopy, Esophagectomy, Closure of a Perforated Peptic Ulcer, Gastrectomy, Bariatric Surgery, Jejunostomy

Unit 3: - [11 Hours] (CO4)

Appendectomy- Open & Laparoscopic, Colostomy, Haemorrhoidectomy, Anal Fissurectomy, Anal Fistulotomy.
Gynaecologic and Obstetric Surgery: Dilation of the Cervix and Curettage of the Uterus (D&C), Vaginal Hysterectomy, Uterine Myomectomy, Total Abdominal Hysterectomy, Tubal Sterilization, Surgery for Ectopic Pregnancy, Caesarean Section

Unit 4: - [10 Hours] (CO5)

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Genitourinary Surgery: Hypospadias Repair, Epispadias Repair, Urethroplasty, Circumcision, Hydrocelectomy, Orchiectomy, Cystoscopy, Transurethral Resection of the Prostate (TURP), Prostatectomy, Nephrectomy,
Orthopaedic Surgery: Open Reduction and Internal Fixation, Arthroscopy, Total Hip Arthroplasty, Total Knee Prosthetic Replacement, Total Ankle Arthroplasty with Prosthetic Joint Replacement.

Suggested Books: -

1. Ajay Yadav and Arora, Synopsis of medical instruments, Jaypee.
2. Raymond Maurice Kirk, Basic Surgical Techniques, ELSEVIOR.
3. Alexis Thomson, Alexander Miles , Manual of Surgery, Morrison and Gibb
4. Ajay kumar Agarwal and neelabhaarwal, Surgical instruments, Jaypee.

Semester		**Fourth (4th)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 405-21	Core Practical/Laboratory	Surgical Procedures Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: .Minor Surgical Procedures.
Task 2: Breast Surgeries
Task 3: Abdominal Procedures.
Task 4: Gastrointestinal Procedures
Task 5: Gynaecological procedures
Task 6: Orthopedic Surgeries
Task 7: Genitourinary procedures.
Task 8: Universal Precautions for all procedures

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Lab Outcome:

CO1: Know About some Minor Surgical Procedures.
CO2: Understanding the Various Breast procedures.
CO3: Know about General surgery procedures.
CO4: Know about various gynae & obstetric procedures.
CO5: Know about various genitourinary & orthopedic procedures.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Suggested Books: -

1. Ajay Yadav and Arora, Synopsis of medical instruments, Jaypee.
2. Raymond Maurice Kirk, Basic Surgical Techniques, ELSEVIOR.
3. Alexis Thomson, Alexander Miles , Manual of Surgery, Morrison and Gibb
4. Ajay kumar Agarwal and neelabhaarwal, Surgical instruments, Jaypee.

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Semester		Fourth (4th)						
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 403-21	Core Theory	Regional Anesthesia Techniques	3	1	0	40	60	100	4

Objective: The aim and objective of this course is to know about introduction of Biochemistry, Metabolism & Pathology.

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Study about Introduction & Classification Regional Anaesthesia.
CO2: Study about various agents used in Regional Anaesthesia, their effects & toxicity.
CO3: Knowledge about Peripheral Nerve Blocks & their Contraindications.
CO4: Learn about Central Neuro-axial Blocks & Applies Anatomy.
CO5: Advantages & Disadvantages of Regional Anaesthesia over General Anaesthesia.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

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Detailed Syllabus:

Unit 1: - [12 Hours] (CO1, CO5)

Regional Anaesthesia-

Introduction and classification- Local Block, Peripheral Nerve Block,

Central Neuraxial Block- Drugs used in Regional Anaesthesia.

Needles used in Regional Anaesthesia.

Use of Local Block in combination with General Anesthesia & its advantages.

Unit 2: - [12 Hours] (CO2)

Considerations during Regional Anesthesia, Systemic effect of Local Anesthetics Toxicity of Local Anesthetics. Individual Agents used, Methods of Local Anaesthesia, Causes of Failure of Local Anaesthesia

Topical Anesthesia- Xylocaine Jelly & EMLA creams

Unit 3: - [11 Hours] (CO4)

Central Neuraxial Blocks: Applied Anatomy, Advantages of CNB over General Anaesthesia, Systemic effects, Spinal Anaesthesia/Block, Intrathecal Block, Saddle Block. Epidural Anaesthesia (Peridural Block)

Combined Spinal Epidural Block, Caudal Block, Level of Block Required for common Surgeries.

Unit 4: - [10 Hours] (CO3)

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Peripheral Nerve Block- Technique, Blocks in Upper Limb, Blocks in Lower Limb,
Blocks in Head & Neck, Blocks in Thorax & Abdomen area.
Contraindications of Peripheral Nerve Block.

Suggested Books: -

1. G. Smith & A.R. Aitkenhead's, Textbook of Anaesthesia, ELSEVIER.
2. Ajay Yadav, Short Textbook of Anaesthesia, JP Brothers.
3. Arun Kumar Paul, Drugs & Equipments in Anaesthetic Practice, Elsevier
4. S Ahanatha Pillai , A Manual of Anesthesia for Operation Theatre, JP Brothers.

Semester		**Fourth (4th)**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 406-21	Core Practical/Laboratory	Regional Anesthesia Techniques Laboratory	0	0	4	60	40	100	2

List of Experiment

Task 1: Local Block
Task 2: Nerve Block
Task 3: Spinal Anesthesia
Task 4: Saddle Block
Task 5: Caudal Block
Task 6:.Epidural Block
Task 7: Combined Spinal Epidural

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Task 8: Complications of Regional Anesthesia

Lab Outcome:

CO1: Study about Introduction & Classification Regional Anaesthesia.
CO2: Study about various agents used in Regional Anaesthesia, their effects & toxicity.
CO3: Knowledge about Peripheral Nerve Blocks & their Contraindications.
CO4: Learn about Central Neuro-axial Blocks & Applies Anatomy.
CO5: Advantages & Disadvantages of Regional Anaesthesia over General Anaesthesia.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	2	3	4	3	3	3
CO2	2	2	2	3	2	3	2
CO3	4	4	4	4	4	2	4
CO4	3	3	2	3	2	2	3
CO5	4	4	4	4	4	2	4

Suggested Books: -

1. G. Smith & A.R. Aitkenhead's, Textbook of Anaesthesia, ELSEVIER.
2. Ajay Yadav, Short Textbook of Anaesthesia, JP Brothers.
3. Arun Kumar Paul, Drugs & Equipments in Anaesthetic Practice, Elsevier
4. S Ahanatha Pillai , A Manual of Anesthesia for Operation Theatre, JP Brothers

Semester	**Fourth (4th)**

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Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
CIS 407-21	Skill Enhancement Course-II	Basic in Computers and Information Science	2	1	0	40	60	100	3

Objective: To teach the fundamental concepts of **Basic in Computer and Information science**.

Course Outcomes: - *At the end of the Course, the student will be able to*

CO1: Illustrate Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.

CO2:CategorizeStorage Devices: Sequential and direct access devices, magn etic tape, magnetic disk, optical disk, mass storage devices.

CO3: Get detailed information about Introduction of Operating System: introduction, operating system concepts, types of operating system.

CO4:Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer

CO5: Prioritize Application of Computers in clinical/ healthcare system.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	2	1	2	1	1	2
CO2	1	2	2	1	2	2	2
CO3	2	1	1	2	2	2	1
CO4	1	3	2	1	2	2	2
CO5	2	1	1	2	1	2	2

Detailed Syllabus:

Unit 1: - [12 Hours] (CO1)

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Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.

Input output devices: Input devices(keyboard, point and draw devices, data scanning
devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).

Processor and memory: The Central Processing Unit (CPU), main memory.

Unit 2: - [11 Hours] (CO2)

Storage Devices: Sequential and direct access devices, magnetic tape, mag netic disk, optical disk, mass storage devices.

Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).

Unit 3: - [12 Hours] (CO1)

Introduction to MS-
Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.

Introduction to powerpoint: introduction, creating and manipulating present ation, views, formatting and enhancing text, slide with graphs.

Unit 4: - [14 Hours] (CO3,CO4,CO5)

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Introduction of Operating System: introduction, operating system concepts, types of operating system.

Computer networks: introduction, types of network (LAN, MAN, WAN, Internet,Intranet), network topological (star, ring, bus, mesh, tree, hybrid), components of network.

Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer
Protocol, telnet, the World Wide Web (WWW)), WWW browsers, use of the internet.

Application of Computers in clinical settings

Suggested Books: -

Banzhaf, W., Nordin, P., Keller, R. E., &Francone, F. D. (1998).*Genetic programming: an introduction: on the automatic evolution of computer programs and its applications*. Morgan Kaufmann Publishers Inc.
Schneider, G. M., &Gersting, J. (2018).*Invitation to computer science*.Cengage Learning.
Goel, A. (2010). *Computer fundamentals*.Pearson Education India.
Dandamudi, S. P. (2003). *Fundamentals of computer organization and design* (Vol. 7). New York: Springer..

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Semester		Fourth (4th)							
Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
CIS 408-21	Skill Enhancement Course- Laboratory	Basic in Computers and Information Science Practical	0	0	2	60	40	100	1

List of Experiment

Task1:Introduction to powerpoint: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

Task 2: Introduction of Operating System: introduction, operating system concepts, types of operating system.

Task 3: Computer networks: introduction, types of network (LAN, MAN, WAN,
Internet,Intranet), network topological (star, ring, bus, mesh, tree, hybrid), components of network.

Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer
Protocol, telnet, the World Wide Web (WWW)), WWW browsers, use of the

Task 4: Application of Computers in clinical settings

Lab Outcome:

CO1: Gain knowledge of , creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

CO2: Discuss Operating System, and types of operating system.

CO3: Be familiar with computer networks, types of network (LAN, MAN, WAN, Internet, Intranet

CO4: Impact of Internet and its Applications, basic services (E-mail, File Transfer

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Protocol, telnet, the World Wide Web (WWW)), WWW browsers.

CO5: Find Applications of Computers in clinical settings.

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	2	1	2	1	1	2
CO2	1	2	2	1	2	2	2
CO3	2	1	1	2	2	2	1
CO4	1	3	2	1	2	2	2
CO5	2	1	1	2	1	2	2

Suggested Books: -

Banzhaf, W., Nordin, P., Keller, R. E., &Francone, F. D. (1998).*Genetic programming: an introduction: on the automatic evolution of computer programs and its applications*. Morgan Kaufmann Publishers Inc.

Schneider, G. M., &Gersting, J. (2018).*Invitation to computer science*.Cengage Learning.

Goel, A. (2010). *Computer fundamentals*.Pearson Education India.

Dandamudi, S. P. (2003). *Fundamentals of computer organization and design* (Vol. 7). New York: Springer..

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Study Scheme & Syllabus of

B.Sc. Medical Technology

(Anaesthesia & Operation Theatre Technology)

(Semester V)

Batch 2021 Onwards

By

Board of Studies

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY
KAPURTHALA

Fifth Semester

Course Type	Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
Core Theory	BAOTT 501-21	Basic Intensive Care	3	1	0	40	60	100	4
Core Theory	BAOTT 502-21	Anaesthesia for Specialty Surgeries I	3	1	0	40	60	100	4
Core Theory	BAOTT 503-21	CSSD Procedures	3	1	0	40	60	100	4
Core Practical/Laboratory	BAOTT 504-21	Basic Intensive Care Laboratory	0	0	4	60	40	100	2
Core Practical/Laboratory	BAOTT 505-21	Anesthesia for Specialty Surgeries-I Laboratory	0	0	4	60	40	100	2
Core Practical/Laboratory	BAOTT 506-21	CSSD Procedures Laboratory	0	0	4	60	40	100	2
Skill Enhancement Course-I	BAOTT 507-21	Basic Biostatistics	2	0	0	40	60	100	2
ACCE	BAOTT 508-21	Minor Project	0	0	1	25	--	25	1
		TOTAL	**11**	**03**	**13**	**365**	**360**	**725**	**21**

*A course can either have four hrs. lecture or three hrs. lecture with one hrs. Tutorial as per requirement

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC Unit and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

Semester		Fifth						
Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 501-21	Core Theory	Basic Intensive Care	3	1		40	60	100	4

Course Outcomes:

CO1: Knowledge about ICU in detail.

CO2: Knowledge about protocols and role of ICU staff.

CO3: Equipment's used in ICU.

CO4 Knowledge about ventilators and its functions.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO 6	PSO 7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Unit 1 **12 hours**

a. Introduction of ICU
b. Types of ICU. Difference between closed and open ICUs. Different types of ICU's e.g. medical, surgical, neuro, stroke and their advantages and disadvantages.
c. Design of I.C.U
d. ICU recommendations by WHO

Unit 2 **10 hours**

e. ICU protocols for various types of procedures.
f. Role and responsibilities of ICU technologists
g. Categorization of ICU with respect to disease of patient.

Unit 3 **11 hours**

Equipment's used in ICU

h. Defibrillator
i. Portable X-Ray (C-arm), use of C-arm and radiation safety.
j. Ultrasound
k. Infusion Pumps
l. Nebulizers

Unit 4 **12hours**

m. Multi-Model Monitor
n. Special ICU Beds
o. ABG Machine
p. ECG Machine
q. Ventilator
r. DVT Pump

Suggested Books: -

1. Namita Padvi, Amit Padvi, Drugs in anesthesia and critical care, CBSPDPaul L. Marino, The ICU book, Wolters Kluwer
2. Rajesh Chawla, Subhash Todi, ICU protocols, Springer

Semester		**Fifth**						
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT 504-21	Core Practical/ Lab	Basic Intensive Care Lab	0	0	4	60	40	100	2

List Of Experiments:

Students will receive practical experience of seeing patients in ICUs and their management under supervision ofICU staff.

a. Monitoring in ICU
b. Principles and mechanism of the defibrillator
c. ECG (electrocardiography)
d. Sterilization and disinfectant of ventilators, beds, lights, and other apparatus
e. Cardiopulmonary resuscitation (CPR)
f. Intubation
g. Tracheotomy
h. CVP (central venous pressure)
i. Urine Catheterization, Insertion of Ryle's tube

Semester		**Fifth**						
Course Code	**CoursType**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT 502-21	**Core Theory**	**Anaesthesia forSpecialty surgeries I**	**3**	**1**		**40**	**60**	**100**	**4**

Course Outcomes: - At the end of the Course, the student will be able to

CO1: Knowledge about anaesthesia used in laparoscopic and OBG.

CO2: Knowledge about anaesthesia used in burn and paediatrics.

CO3: Knowledge about anaesthesia used outside OT and at high altitudes.

CO4: Knowledge about anaesthesia used in day care and for trauma.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Unit 1: **12 hours**

Obstetric anesthesia: Differences between use of type of anesthesia in pregnant and a non-pregnant patient, Risks for anesthesia, Precautions to be taken, Check list, Regional vs general anaesthesia, Induction / maintenance and recovery. Effect of anesthetic technique/ drugs on uteroplacental circulation, Resuscitation of the new born, APGAR score, Basic knowledge about transfer of anesthetic drugs to fetal circulation, Reversal and extubation, Emergencies - manual removal of placenta - A.P.H. - P.P.H. - ruptures uterus - ectopic pregnancy.

Anesthesia for laparoscopic surgeries- use of types of different gases for creating pneumoperitoneum, Pathophysiological effects of laparoscopy, Complications of anesthesia in laparoscopy, Anesthetic management, Contraindications for laparoscopy.

Unit 2: **10 hours**

Paediatric anesthesia- Physiological/Anatomical Changes in Pediatric Population, Theatre setting, Check list, Premedication – modes, Induction, Intubation - Securing the ETT, Reversal & extubation – Problems, Transferring / ICU management, Pain management. Management of Neonatal Surgical Emergencies

Anesthesia for management of burn patients.

Unit 3: **12 hours**

ENT Anesthesia - Anesthesia for adenotonsillectomy - Anaesthesia for mastoidectomy - Bronchoscopy and esophagoscopy, Anesthesia for Bronchoscopy, Anesthesia for Peritonsillar Abscess and Ludwig Angina, Anesthesia for Obstructive Sleep Apnea Surgery, Anesthesia for Temporomandibular Joint (TMJ) Surgeries,

Anesthesia outside the O.T., Situations, Cath Lab, Radiology, E.C.T. Short comings.

Anesthesia at Remote Locations •

Anesthesia at Low Barometric Pressure (High Altitude), Anesthesia at High Pressure (in Hyperbaric Chamber)

Unit 4: 11 hours

Day-care anesthesia •Selection of Surgery/Procedures and Patients, Special features, Set up, Advantages, Disadvantages, Complications, Future, Total Intravenous Anesthesia, Monitored Anesthesia Care, Postoperative Period for trauma & shock

Resuscitation, Preoperative investigation I assessment, Circulatory management, management of anesthesia, Rapid sequence induction, other problems.

Semester		**Fifth**						
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT 505-21	**Core Practical/Lab**	**Anaesthesia for Specialty Surgeries I- Lab**	**0**	**0**	**4**	**60**	**40**	**100**	**2**

List Of Experiments

1. Demonstration of different types of anesthesia in relation to patients:

   a. With pregnancy.
   b. Undergoing Laparoscopy,
   c. Suffering from Angina
   d. Undergoing Bronchoscopy
   e. Undergoing Tracheostomy
   f. Undergoing Rapid sequence intubation

2. Theatre setting during pediatric surgery.

3. APGAR score & GCS

Semester		**Fifth**						
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT 503-21	**Core Theory**	**CSSD* Procedures**	**3**	**1**	**0**	**40**	**60**	**100**	**4**

***Central Sterile Supply Department**

Course Outcomes: - At the end of the Course, the student will have

CO1: Knowledge about collection of used items in hospitals & classification of equipment for cleaning purposes.

CO2: Knowledge about wrapping and packing assembling.

CO3: Knowledge about principles of sterilization & methods of sterilization.

CO4: Knowledge about Techniques of sterilization of various heat reliable articles.

Course Outcomes and Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO 6	PSO 7
CO1	4	4	3	4	2	2	3
CO2	2	3	4	4	2	2	2
CO3	4	4	4	4	4	2	4
CO4	3	4	3	2	4	3	3
CO5	4	4	4	4	4	2	4

Unit 1: **12 hours**

Collection of used items from used area, reception protective clothing and disinfection safe guard, Use of disinfectants, sorting and classification of equipment (sharps, blunts, delicate instruments or heat liable instruments) for cleaning purposes. **Cleaning process** - use of detergents, mechanical cleaning procedure/ decontamination procedures, cleaning jars, trays, basins and similar hardware utensils. Cleaning of catheters, tubing, glass ware etc.

Unit 2: **8 hours**

Materials used for wrapping and packing/assembling of load. Types of packs prepared. Method of wrapping and making use of indicators to show that a pack of container has been through a sterilization process, shelf-life and the distribution of sterile load.

Unit 3: **14 hours**

Principles and methods of sterilization including newer methods like EO gas, H202 and plasma sterilization.

Methods of sterilization

a. Dry heat sterilization.
b. Moist heat sterilization.
c. Filtration
d. Sterilization by radiation (Gamma rays, ultraviolet rays) and sterilization controls.
e. Different methods of disinfection.

Unit 4: **10 hours**

Techniques of sterilization of rubber and other heat sensitive articles. (LMA, FOB, ETT, Laryngoscopes, Anesthesia machines and circuits.) Technique of sterilization of carbonized articles.

Methods of disinfection.

a) Boiling.
b) Chemical disinfection.
c) Mechanical cleaning

Hazards of sterilization and its prevention.

Precautions to be taken during sterilization and recent advances in the methods of sterilization

Suggested Books:

1. Kumar S. Textbook of microbiology. JP Medical Ltd; 2012 Sep 30.
2. Draugalis JR, Coons SJ, Plaza CM. Best practices for survey research reports: a synopsis for authors andreviewers. American journal of pharmaceutical education. 2008 Sep 1;72(1).
3. Medical Laboratory science theory and Practice by J Ochei & A Kolatkar. Mc Graw Hill

Semester		Fifth						
Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 506-21	Core Practical / Lab	CSSD Procedures Lab	0	0	4	60	40	100	2

List Of Experiments:

a) Working of different types of Autoclaves.
b) Working of Hot air oven.
c) Procedure of EO
d) Procedure of instruments packing.
e) Procedure of Fumigation of Operation theater.
f) Use of different types of Disinfectants.
g) Procedure of scrubbing
h) Procedure of washing.
i) Sterilization of the anesthetic instruments.
j) Procedure of sterilization in chamber

Semester		**Fifth**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 507-21	**Ability Enhancement Compulsory Course (ACCE)**	**Basic Biostatistics**	2	0	0	40	60	100	2

Course Outcomes: - At the end of the Course, the student will be able to

Rationale: The students will be made aware of the need of biostatistics and understanding of data and samplingmethods

CO 1: Study about Biostatics & understanding of data in Biostatics: -

a. Need of biostatistics
b. What are biostatistics: beyond definition
c. Understanding of data in biostatistics
d. How & where to get relevant data

CO 2: Study the relation between data and variables & types of Variables: -

a. Relation between data &variables
b. Type of variables: defining dataset
c. Collection of relevant data: sampling methods

CO 3: Study type, Sample size and Population

a. Construction of study: population, sample, normality and its beyond (not design of study, perhaps),
   Summarizing data on the pretext of underlined study

b. Statistical Data Analysis

Unit 1: 12 hours

Elementary Statistics: The mean, median, mode, standard deviation, variance, covariance of data. Representation of data- discrete data, continuous data, histogram, polygons, frequency curves. Mean, Median, Quartiles, Percentile, Skewness, Standard deviation, Variance, Box and whisker diagrams (box plots), Scatter diagrams, Introduction to statistical sampling from a population, Random Sampling.

Unit 2: 10 hours

Probability: Basic concepts, sample space and events, use of counting method in probability, addition law, Bayes theorem. Probability: Experimental Probability, Probability when outcomes are equally likely, Subjective Probabilities, Probability laws Probability rules for Combined events, Conditional Probability and Independent Events, Probability trees.

Unit 3: 12 hours

Introduction to Correlation & Regression: Scatter diagram, Linear correlation, linear regression lines. Random Variables and Probability Discrete random variables, their Probability Mass function, Probability Density Function Mean and variance. Binomial and Poisson Distributions Continuous Random variables, their Probability Mass function, Probability Density Function Mean and variance, Normal DistributionCumulative distribution function

Unit 4: 8 hours

Hypothesis Testing: Concept of Null and Alternate Hypothesis, Chi-square test (Goodness of fit and association of attributes). Fischer test, Student t-test, One way ANOVA

Suggested Books:

1. Elhance D.N. (1984). Fundamentals of Statistics. Kitab Mahal, Allahabad.
2. Mendenhall W. and Sincich T. (1995). Statistics for engineering and sciences (IVth edition). Prentice Hall. Andsciences (IVth edition). Prentice Hall.
3. B.A./B.Sc Part-I (12+3 System of Education) 225 Gupta S.P. (2000). Statistical methods. Sultan Chand andCompany, New Delhi.
4. Kapoor V.K. and Gupta S.C. (2000) Fundamentals of Mathematical Statistics. Sultan Chand and Company, New Delhi 5. J. Crawshaw and J Chamber (2002) Advanced level Statistics, 4th Edition, Melson Thornes.
5. Brian S., Ripley D. and Venables W. N. (2002). Modern Applied Statistics. Springer Verlag.
6. J. Crawshaw and J Chamber (2002), Advanced Level Statistics, 4 th Edition, Melson Thornes.
7. Kapoor V.K. and Gupta S.C. (2000) Fundamentals of Mathematical Statistics. Sultan Chand and Company, NewDelhi
8. Gupta S.P. (2000). Statistical Methods. Sultan Chand and Company, New Delhi.
9. Mendenhall W. and Sincich T. (1995). Statistics for Engineering and Sciences (IV th edition). Prentice Hall. 6 Elhance D.N. (1984). Fundamentals of Statistics. Kitab Mahal, Allahabad

Semester		**Fifth**							
Course Code	Course Type	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT 508-21	**Ability Enhancement Compulsory Course (ACCE)**	**Minor Project**	**0**	**0**	**1**	**25**	**--**	**25**	**1**

For evaluation of Professional Training, a clinical training certificate will be awarded by the hospital where the candidate has taken training. After taking 1 month training from hospital the candidate shall report back to parent institute where he/she will submit his/her certificate and will attend theinstitute for rest of the semester period.

Study Scheme & Syllabus of

B.Sc. Medical Technology

(Anaesthesia& Operation Theatre Technology)

(Semester VI)

Batch 2021 Onwards

By

Board of Studies

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

Sixth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 601-21	Core Theory	ICU Management	3	1	0	40	60	100	4
BAOTT 602-21	Core Theory	Anaesthesia for Specialty Surgeries II	3	1	0	40	60	100	4
BAOTT 603-21	Core Theory	Anaesthesia for coexisting diseases	3	1	0	40	60	100	4
BAOTT 604-21	Core Practical/ Laboratory	ICU Management	0	0	4	60	40	100	2
BAOTT 605-21	Core Practical/ Laboratory	Anaesthesia for Specialty Surgeries-II Laboratory	0	0	4	60	40	100	2
BAOTT 606-21	Core Practical/ Laboratory	Anaesthesia for Coexisting Diseases	0	0	4	60	40	100	2
BAOTT 607-21	Skill Enhancement Course-I	Anaphylactic Reactions and Autoimmunity Outlines	2	1	0	40	60	100	3
		TOTAL	**11**	**04**	**12**	**340**	**320**	**700**	**21**

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

Semester		**Sixth**						
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT 601-21	**Core Theory**	**ICU Management**	**3**	**1**		**40**	**60**	**100**	**4**

Course Outcomes:

CO1: Study about ICU in detail.

CO2: Knowledge about different types of monitoring in ICU.

CO3: Knowledge about respiratory diseases encountered in ICUs.

CO4 Study about ventilators and its functions.

Module1 **12 hours**

Students will also learn about different procedures and monitoring done in ICUs.

a. Central Venous Pressure
b. Non-Invasive Blood Pressure& Invasive Blood Pressure
c. Intracranial Pressure and Intraocular pressure
d. Electrocardiography
e. Electromyography and Electroencephalography

Module2 **10 hours**

a. Bi-Spectral Index Monitoring
b. Capnography
c. Temperature Monitoring
d. Pulmonary Capillary Wedge Pressure
e. Auscultation Of Bowel Sounds

Module3 **11 hours**

Students will also learn about different respiratory diseases encountered in ICUs. This will include the signs and symptoms, the investigations and their interpretation. They will also be taught as to how to handle respiratory emergencies.

a. Asthma
b. Chronic Obstructive Pulmonary Disorder
c. Acute Respiratory Distress syndrome

Module4 **12 hours**

d. Pneumonia
e. Respiratory Failure
f. Atelectasis

Semester		**Sixth**							
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT 602-21	**Core Practical/ Lab**	**ICU Management -Lab**	**0**	**0**	**4**	**60**	**40**	**100**	**2**

List of Experiments:

Students are expected to practically see what procedures are done on patients in the ICU.

Procedures in ICU

a. Central venous catheterization,
b. Haemodialysis,
c. Invasive Arterial Blood Pressure Monitoring,
d. Portable X-Ray,
e. Urinary Catheterization,
f. Intubation,
g. Oxygen Therapy
h. Feeding,
i. Care Of Unconscious Patient,
j. Nutritional Therapy,
k. Transport Of Critically Ill Patient (Inter and Intra Hospital Transport)
l. Ventilators: Principles of working of different ventilators:

Suggested Books:-

1. NamitaPadvi,AmitPadvi,Drugsinanaesthesiaandcriticalcare,CBSPDPaulL.Marino,TheICUbook,Wolters Kluwer
2. Rajesh Chawla, Subhash Todi,ICU protocols,Springer
3. Oh's Intensive Care Manual by Andrew D. Bersten and Jonathan Handy

Semester		**Sixth**						
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT603-21	**Core Theory**	**Anaesthesia for Specialty Surgeries II**	**3**	**1**		**40**	**60**	**100**	**4**

Course Outcomes:- At the end of the Course, the student will be able to

CO1: Study about Anaesthesia used in Thoracic.

CO2: Knowledge about Anaesthesia used in pain management, geriatric and bariatric surgeries.

CO3: Knowledge about Anaesthesia used in cardiac OT.

CO4:Study about Anaesthesia used in neuro procedures.

Module1: 12 hours

a. **Thoracic anaesthesia** • Pulmonary function tests o bed side o Vitallograph • Preoperative preparation • Premedication • Check list • Induction. Intubation • Double lumen tubes • monitoring Pain management • Extubation • ICU management.

Module2: 10 hours

b. **Anaesthesia in pain management**. Assessment of Pain, Acute Pain Management, Acute Pain Management, Commonly Used Pain Blocks.

c. **Geriatric anaesthesia** • Physiological changes • Diseases of aging • Nervous system • Geriatric pharmacodynamics / pharmacokinetics • Postoperative nervous system dysfunction.

d. **Anaesthesia for obese patients** (Bariatric Anaesthesia) • Preoperative Assessment • Intraoperative • Postoperative

Module3: **12 hours**

e. **Cardiac anaesthesia**: NYHA classification • Arrhythmias • Angina • Dyspnoea • Special investigations, echo cardiography o 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 • Transferring the patient to ICU. • Care to be taken • I.C.U management. • Chest tube management.

Module4: **11hours**

f. **Neuro anaesthesia** • Cerebral Physiology and Pharmacology, • General Considerations in Neurosurgical Patients Glassgow coma scale • Premedication • Special investigation - CT, Angiography and MRI • Checklist • Induction of a patient • Reinforced Endotracheal tubes • Postioning in neuro surgery • Air embolism, • Anaesthesia for Conditions with Raised Intracranial Tension• Anaesthesia for Awake Craniotomies• Reversal of the patient • Transferring to I.C.U. / Ward.

Semester		**Sixth**						
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT604-21	**Core Practical/Lab**	**Anaesthesia for Specialty Surgeries I-Lab**	**0**	**0**	**4**	**60**	**40**	**100**	**2**

List of Experiments

Students are expected to observe and do the assessments that are done on patients in the ICU and OR.

a. NYHA classification
b. ASA classification
c. Physiological changes in old age
d. Assessment of Pain
e. Pulmonary function tests
f. Spirometry
g. Vitallograph
h. Glassgow Coma Scale
i. Cardiac cycle.
j. Cardiac contractility and stroke volume.

k. Cardiac output and its measurement

Semester		**Sixth**						
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT605-21	**Core Theory**	**Anaesthesia for coexisting diseases**	**3**	**1**		**40**	**60**	**100**	**4**

Course Outcomes:- At the end of the Course, the student will be able to

CO1: Study About collection of used items & classification of equipment for cleaning purposes.

CO2: Knowledge about wrapping and packing assembling.

CO3: Knowledge about principle sterilization methods.

CO4: Study about Techniques of sterilization.

Module1: 12 hours

a. Anaesthesia for Cardiovascular Diseases

Ischemic Heart Disease • Valvular Diseases • Congenital Heart Diseases• Heart Failure Cardiomyopathies• Pericardia l Diseases (Constrictive Pericarditis/ Cardiac Tamponade)

b. Anaesthesia for Hepatic Diseases

Preoperative Evaluation • Intraoperative • Anaesthesia for Patients with Biliary Obstruction

Module2: 8 hours

a. Anaesthesia for Endocrinal Disorders

Diabetes Mellitus • Thyroid Dysfunctions • Hypothyroidism • Adrenal Dysfunctions Pituitary Dysfunction

b. Anaesthesia for Disorders of Blood

Anaemia • Sickle Cell Disease • Thalassemia • Polycythaemia • Disorders of Haemostasis G6PD Deficiency • Porphyria

Module3: 14 hours

a. Anaesthesia for Respiratory Diseases

General Considerations in Management of Patient with Pulmonary Disease • Asthma • Chronic Obstructive Pulmonary Disease (Chronic Bronchitis and Emphysema) • Restrictive Lung Diseases • Tuberculosis • Respiratory Tract Infection • Operative Criteria for Thoracotomy/ Pneumonectomy

b. Anaesthesia for Central Nervous System Diseases

Parkinson's disease • Alzheimer's disease • Epilepsy • Stroke • Headache • Multiple Sclerosis • Syringomyelia • Amyotrophic Lateral Sclerosis • Autonomic Dysfunction • Spinal Cord Transection • Psychiatric Disorders

Module4: 10 hours

a. Anaesthesia for Renal Diseases and Electrolyte Imbalances

Anesthetic Management of Patients with Renal Dysfunction • Anaesthesia for Transurethral

Resection of Prostate • Anaesthesia for Patients with Electrolyte Imbalances

b. Anaesthesia for Neuromuscular Diseases

Myasthenia Gravis • Myasthenic Syndrome • Familial Periodic Paralysis • Muscular

Dystrophies

Semester		**Sixth**						
Course Code	**Course Type**	**Course Title**	**Load Allocation**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	**T***	**P**	**Internal**	**External**		
BAOTT606-21	**Core Practical /Lab**	**Anaesthesia for coexisting diseases Lab**	**0**	**0**	**4**	**60**	**40**	**100**	**2**

List of Experiments:

Students are expected to observe, learn and do the assessments that are done on patients in the ICU and OR.

- Setting of peripheral line & catheterization tray
- Setting of emergency airway equipment trolley
- Setting of emergency drug trolley
- Setting of ventilators
- Setting of Infusion pumps
- Setting of defibrillators
- Setting and preparation for arterial blood pressure monitoring line
- Setting and preparation of tracheostomy set
- Setting of CVP monitoring set

- BLS and ACLS in ICU
- Parenteral nutrition in ICU

Suggested Books:

1. **"**Basics of Anaesthesia" by Ronald D. Miller and Manuel Pardo.

2. "Morgan & Mikhail's Clinical Anesthesiology" by John F. Butterworth IV and David C. Mackey

3. "Stoelting's Anaesthesia and Co-Existing Disease" by Roberta L. Hines and Katherine E. Marschall

4. Textbook of Anaesthesia by Aitkenhead AR, Smith G, and Rowbotham DJ**:**

5. Anaesthesia and Intensive Care A-Z: An Encyclopaedia of Principles and Practice by Steven M. Yentis, Nicholas P. Hirsch, and James K. Ip

Semester		**Sixth**							
Course Code	**Course Type**	**Course Title**	**Load Allocations**			**Marks Distribution**		**Total Marks**	**Credits**
			L*	T*	P	Internal	External		
BAOTT607-21	**Ability Enhancement Compulsory Course (ACCE)**	**Anaphylactic Reactions and Autoimmunity Outlines**	**2**	**1**	**0**	**40**	**60**	**100**	**3**

Course Outcomes:- At the end of the Course ,the student will be able to

CO1: learn about anaphylactic reaction, etiology,

CO2: learn about immunity and its types

CO3: gain knowledge about autoimmunity

Module1: **12 hours**

a. Definition, etiology

b. Type Of Anaphylactic Reactions

c. Signs & Symptoms

Module2: **10 hours**

d. Drugs Used for anaphylactic reaction

e. Management

f. Immunity and its types. Classification of immunoglobulins

Module3: **12 hours**

Autoimmunity outlines

g. Definition
h. Mechanism
i. Causes
j. Signs and symptoms

Module4: **8 hours**

k. Diseases of autoimmunity
l. Management

Suggested Books:

1. Anaphylaxis: A Comprehensive Review by Stanley J. Szefler, Mariana C. Castells, and James L. Baldwin
2. Anaphylaxis in the Hospital Setting by Michelle Hernandez and Richard L. Wasserman
3. Drug Allergy: Clinical Aspects, Diagnosis, Mechanisms, Structure-Activity Relationships by P.H. Demoly, W.J. Pichler, and M. Pirmohamed