Ordinance No. 22 (2)

Bachelor of Science
(B.Sc.)

(Discipline- Operation Theatre Technology)
(Honours in Anaesthesiology)

Faculty of Medicine

Department of Paramedical Sciences,
Subharti Medical College,
Swami Vivekanand Subharti University, Meerut

Ordinance No- 22(2)

Ordinance relating to Bachelor of Science in Operation Theatre Technology (Honours in Anaesthesiology) (B.Sc. OTT HA) courses

Chapter – 1
(General)

1. This ordinance may be called the Ordinance Relating to "Bachelor of Science in Operation Theatre Technology Honours in Anaesthesiology (B.Sc. OTT HA) Course"
2. It shall come into force with immediate effect.
3. This ordinance shall apply to all programs leading to Bachelor degree in Operation Theatre Technology Honours in Anaesthesiology.

Chapter – 2
(Eligibility for Admission)

4. For admission to B.Sc. O. T. Technology Honours in Anaesthesiology course an applicant should be Intermediate (10+2) or its equivalent from a recognized Board with minimum 45% marks in Physics, Chemistry, Biology& English.
5. For Lateral Entry admission, Intermediate (12^{th}) + Diploma in Operation Theatre Technology (2 years) / High School (10^{th}) + Diploma in Operation Theatre Technician/technology (3 years) passed students from university / board recognized by central/state government can directly admitted to 2^{nd} year of B.Sc. O. T. Technology Honours in Anaesthesiology course.

Chapter – 3
(Teaching Course)

6. The course will be of four-year duration consisting of three years and six-month academic years. After successful completion of three years and six-month course, there will be a 6-month mandatory rotary Internship.
7. The academic calendar shall be as follows

Session	-	1^{st} August to 30^{th} May
Examination	-	1^{st} June to 15^{th} June

8. Teaching subjects and examination evaluation scheme selection. Change of branch will be permitted within 2 months of admission. No change of branch will be allowed after the stipulated time.

COURSE STRUCTURE

Semester	Course	Code	Credit (L+T+P) *
	B.Sc. in Operation Theatre Technology Honours in Anaesthesiology		
I	Human Anatomy and Physiology	BOTT-101	3+1+2
I	General Pathology and Microbiology	BOTT-102	3+1+2
I	Medical Biochemistry	BOTT-103	3+1+2
I	Introduction to Operation Theatre Technology	BOTT-104	3+1+2
I	Computational Skills and Biostatistics	BOTT-105	3+1+2
I	General English and Communication Skills	BOTT-106	3+1+0
II	Applied Anatomy and Physiology	BOTT-201	3+1+2
II	Clinical Pharmacology	BOTT-202	3+1+2
II	Clinical Pathology and Applied Microbiology	BOTT-203	3+1+2
II	Medical Ethics and Operation theatre instruments	BOTT-204	3+1+2
II	Central Sterile Supply Department Technique and Nursing Procedure	BOTT-205	3+1+2
III	Medical Relevant to Operation theatre	BOTT-301	3+1+2
III	Basics of Surgery	BOTT-302	3+1+2
III	Clinical in Operation Theatre Technology	BOTT-303	3+1+2
III	Applied Operation Theatre Technology	BOTT-304	3+1+2
III	Recent Advances in Operation Theatre Technology	BOTT- 305	3+1+2
IV	Regional Anaesthetic Techniques	BOTT-A-401	3+1+2
IV	Post Anaesthesia Care	BOTT-A-402	3+1+2
IV	Anaesthesia Specialty Surgery	BOTT-A-403	3+1+2

*L- Lecture, T-Tutorial, P- Practical

9. **Distribution of Marks Branch Wise, Teaching subjects and examination evaluation scheme**

9. a) For B.Sc. in Operation Theatre Technology Honours in Anesthesiology

FIRST YEAR

S.No	Subject Code	Subject Name	Hours Perweek				Examination Scheme				
			L	T	P	C	Theory Marks		Practical Marks		Grand Total
							UE	CCE	UE	CCE	
1	BOTT-101	Human Anatomy and Physiology	3	1	-	4	70	30	-	-	100
2	BOTT-102	General Pathology and Microbiology	3	1	-	4	70	30	-	-	100
3	BOTT-103	Medical Biochemistry	3	1	-	4	70	30	-	-	100
4	BOTT-104	Introduction to Operation Theatre Technology	3	1	-	4	70	30	-	-	100
5	BOTT-105	Computational Skills and Biostatistics	3	1	-	4	70	30	-	-	100
6	BOTT-106	General English and Communication Skills	3	1	-	4	70	30	-	-	100
7	BOTT-101P	Human Anatomy and Physiology Practical	-	-	2	2	-	-	40	10	50
8	BOTT-102P	General Pathology and Microbiology Practical	-	-	2	2	-	-	40	10	50
9	BOTT-103P	Medical Biochemistry Practical	-	-	2	2	-	-	40	10	50
10	BOTT-104P	Introduction to Operation Theatre Technology Practical	-	-	2	2	-	-	40	10	50
11	BOTT-105P	Computational Skills and Biostatistics Practical	-	-	2	2	-	-	40	10	50
Total Credit			**18**	**6**	**10**	**34**	**420**	**180**	**200**	**50**	**850**

*L- Lecture, T-Tutorial, P- Practical, C -Credit, CCE- Continuous Comprehensive Evaluation,
UE- University External

9. b) For B.Sc. in Operation theatre technology Honours in Anesthesiology

SECOND YEAR

S.No	Subject Code	Subject Name	Hours Perweek				Examination Scheme				
			L	T	P	C	Theory Marks		Practical Marks		Grand Total
							UE	CCE	UE	CCE	
1	BOTT-201	Applied Anatomy and Physiology	3	1	-	4	70	30	-	-	100
2	BOTT-202	Clinical Pharmacology	3	1	-	4	70	30	-	-	100
3	BOTT-203	Clinical Pathology and Applied Microbiology	3	1	-	4	70	30	-	-	100
4	BOTT-204	Medical Ethics and Operation Theatre Instruments	3	1	-	4	70	30	-	-	100
5	BOTT-205	Central Sterile Supply Department Technique and Nursing Procedure	3	1	-	4	70	30	-	-	100
6	BOTT-201P	Applied Anatomy and Physiology Practical	-	-	2	2	-	-	40	10	50
7	BOTT-202P	Clinical Pharmacology Practical	-	-	2	2	-	-	40	10	50
8	BOTT-203P	Clinical Pathology and Applied Microbiology Practical	-	-	2	2	-	-	40	10	50
9	BOTT-204P	Medical Ethics and Operation Theatre Instruments Practical	-	-	2	2	-	-	40	10	50
10	BOTT-205P	Central Sterile Supply Department Technique and Nursing Procedure Practical	-	-	2	2	-	-	40	10	50
Total Credit			**15**	**5**	**10**	**30**	**350**	**150**	**200**	**50**	**750**

*L- Lecture, T-Tutorial, P- Practical, C -Credit, CCE- Continuous Comprehensive Evaluation, UE- University External

9.c) For B.Sc. in Operation theatre technology Honours in Anesthesiology

THIRD YEAR

S. No	Subject Code	Subject Name	Hours Perweek				Examination Scheme				
			L	T	P	C	Theory Marks		Practical Marks		Grand Total
							UE	CCE	UE	CCE	
1	BOTT-301	Medical Relevant to Operation Theatre	3	1	-	4	70	30	-	-	100
2	BOTT-302	Basics of Surgery	3	1	-	4	70	30	-	-	100
3	BOTT-303	Clinical in Operation Theatre Technology	3	1	-	4	70	30	-	-	100
4	BOTT-304	Applied Operation Theatre Technology	3	1	-	4	70	30	-	-	100
5	BOTT-305	Recent Advances in Operation Theatre Technology	3	1	-	4	70	30	-	-	100
6	BOTT-301P	Medical Relevant to Operation Theatre Practical	-	-	2	2	-	-	40	10	50
7	BOTT-302P	Basics of Surgery Practical	-	-	2	2	-	-	40	10	50
8	BOTT-303P	Clinical in Operation Theatre Technology Practical	-	-	2	2	-	-	40	10	50
9	BOTT-304P	Applied Operation Theatre Technology Practical	-	-	2	2	-	-	40	10	50
10	BOTT-305P	Recent Advances in Operation Theatre Technology Practical	-	-	2	2	-	-	40	10	50
Total Credit			**15**	**5**	**10**	**30**	**350**	**150**	**200**	**50**	**750**

*L- Lecture, T-Tutorial, P- Practical, C -Credit, CCE- Continuous Comprehensive Evaluation, UE- University External

9. d) For B.Sc. in Operation theatre technology Honour in Anesthesiology

FOURTH YEAR

S.No	Subject Code	Subject Name	Hours Perweek				Examination Scheme				
			L	T	P	C	Theory Marks		Practical Marks		Grand Total
							UE	CCE	UE	CCE	
1	BOTT-A-401	Regional Anaesthetic Techniques	3	1	-	4	70	30	-	-	100
2	BOTT-A-402	Post Anaesthesia Care	3	1	-	4	70	30	-	-	100
3	BOTT-A-403	Anaesthesia Specialty Surgery	3	1	-	4	70	30	-	-	100
4	BOTT-A-401P	Regional Anaesthetic Techniques Practical	-	-	2	2	-	-	40	10	50
5	BOTT-A-402P	Post Anaesthesia Care Practical	-	-	2	2	-	-	40	10	50
6	BOTT-A-403P	Anaesthesia Specialty Surgery Practical	-	-	2	2	-	-	40	10	50
Total Credit			**9**	**3**	**6**	**18**	**210**	**90**	**120**	**30**	**450**

SUMMARY OF CREDIT SYSTEM
For B.Sc. in Operation Theatre Technology Honours in Anaesthesiology

S. No.	Year	NO. OF CREDIT
1	I	34
2	II	30
3	III	30
4	IV	18
Lab Posting /MOOC Courses/ Internship		-
GRAND TOTAL		**112**

Chapter – 4
(Attendance)

10. The students are expected to attend all the classes and should not have less than 75% attendance in theory as well as in practical classes, wherever held, to become eligible to appear for the university examination. Short fall in attendance can, however be condoned in deserving cases to the extent of 10% by the Principal. If the short fall is more than 10% but not more than 15%, the Principal may recommend deserving cases to the Vice Chancellor for condonation. The order of the Vice Chancellor in this regard shall be final.

Chapter – 5
(Examination)

11. The Examination are to be designed with a view to ascertain whether the candidate has acquired adequate knowledge and skills along with clear concepts of the fundamentals, which are necessary for him to carry out his professional day to day work competently. Evaluation will be carried out on an objective basis.

11.1 **University Examination:**

Only those candidates will be allowed to appear in University Examinations who fulfill the following criteria:

11.1.1. Attendance: 75% of attendance in a subject for appearing in the examination is compulsory.

11.1.2 Internal assessment: Candidate must have obtained a minimum of 35% marks allotted for internal assessment

11.2 (a) Theory examinations of the first, second and third year would be held according to the prescribed syllabus in each year for theory examination.

(b) For practical examination for 1st year: The syllabus of 1st year.
For 2nd year practical exam: Combined syllabus of 1st and 2nd year.
For 3rd year practical exam: Combined syllabus of all 3 years.

11.3 Record Book: At the time of practical examination each candidate shall submit to the Examiner the practical manual duly certified by the head of the Department as a bonafide record of work done by the candidate.

11.4 **Internal Assessment**:

Internal assessment for Theory will be based on class test and terminal examinations.

Internal assessment for Practical work shall be based on day to day work assessment (practical manual) and marks obtained in Practical class test & terminal examinations.

a. A maximum of **10 marks** in each subject shall be awarded for attending classes (theory / practical/OT Posting) as per the following norms:

85% or more attendance	-	10 Marks
80% or more but less than 85% attendance	-	9 Marks
75% or more but less than 80% attendance	-	8 Marks
70% or more but less than 75% attendance	-	7 Marks
65% or more but less than 70% attendance	-	5 Marks
60% or more but less than 65% attendance	-	3 Marks

51% or more but less than 60% attendance	-	2 Marks
50% attendance	-	1 Mark
Less than 50% attendance	-	0 Mark

11.5 The entire course has to be completed within a maximum of five years from the date of original admission in the course.

Chapter–6
Paper setting, Evaluation and Results

12. The work of setting the End semester examination papers, conduct of the End semester and Annual examinations, Evaluation and declaration of results shall be as per the laid down Examination policies / latest University Notifications.

Chapter – 7
Power to Modify

13. In the event of any emergent situation, if any deviation is considered necessary, the Vice Chancellor is authorized to modify the Ordinance. Subject to subsequent ratification by the Executive Council.

Chapter-8
Compulsory rotatory Internship

14.1 **General: -**Internship is a phase of training wherein a graduate is expected to conduct actual practice of Operation Theatre Technology and acquire skills under supervision so that he/she may become capable of functioning independently. It will be of six months duration.

14.2 **Specific Objectives: -**

14.2.1At the end of internship training the graduate shall be able to:

14.2.1.1 Instrument for all anaesthetic techniques.

14.2.1.2 Use discretely the CSSD technique.

14.2.1.3 Prepare all type of operation room before surgery.

14.3 **INTERNSHIP TIME DISTRIBUTION (Main Objective)**

Total Period and Internship: 6 Months

S. No.	OT units	Time Period
1	CSSD and Autoclave Room	1 Month
2	Surgery O.T.	1 Month
3	Orthopedics O.T.	1 Month
4	ENT and Eye O.T.	1 Month
5	Gynecology and Emergency O.T.	1 Month

6	PAC and Pre Op. O.T.	1 Month

15.4 **OTHER DETAILS**

15.4.1 All parts of internship shall be done as far as possible in the Hospitals.

15.4.2 Every candidate will be required after passing the final B.Sc. (Operation Theatre Technology Honors in Anesthesiology) Examination to undergo compulsory rotatory internship to the satisfaction of the college Authorities and University concerned for a period of 6 months so as to be eligible for the award of the degree of Bachelor of Science in Operation Theatre Technology (Honors in Anesthesiology) and registration

15.4.3 The University shall issue a provisional B.Sc. Pass Certificate on passing the final examination.

15.4.4 The Intern shall be entrusted with Operation Theatre responsibilities under direct supervision of O.T. Incharge/ Technician. They shall not be working independently.

15.5 ASSESSMENT OF INTERNSHIP

15.5.1 The Interns maintain the record of work/ logbook, which is to be verified and certified by the O.T. In charge/ Technician under whom he/she works. A part from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation, tests in knowledge, skills and attitude during and the end of training. Based on the record of work and date of evaluation, the H.O.D. shall issue Certificate of Satisfactory Completion of training following which the University shall award the B.Sc. O. T. Technology (Honors in Anesthesiology) Degree to declare the candidate eligible for the same.

15.5.2 Satisfactory completion shall be determined on the basis of the following:

15.5.2.1 Proficiency of knowledge required for each O.T. Techniques.

15.5.2.2 The competency in skills expected to manage each O.T. Technique.

15.5.2.2.1 Competency for performance

15.5.2.2.2 As assistance in procedures

15.5.2.2.3 Procedures of O.T. Techniques having observed.

15.5.2.3 Responsibility, punctuality, work up of O.T. Techniques, involvement in procedures, follow up of report.

15.5.2.4 Capacity to work in a team (behavior with colleagues, O.T. Technician, nursing staff and relationship with Medical and Paramedical.)

15.5.2.5 Initiating participation in discussions, research aptitude.

Program outcome

After successful completion of the degree in B. Sc. O.T. Technology Honours in Anaesthesiology, the students should be able to-

PO1-They are capable of taking care of basic patient monitoring activities and also shifting of the patient carefully. They are able to arrange all the facilities in the operation theatre.

PO2-OT Technician can communicate with the patient about their surgery or operation. They are capable to take history of the patients and also communicate with the attendants of the patient by their skills.

PO3- They look after all the work and management of the operation theatre. They can perform the general function of an OT technician under the instructions of the Doctor/Surgeon leading the surgery, assisting the Doctor/Surgeon during the operation. They look after the drugs the required for surgery, anesthetic gases, drapes and all the linen and their sterilization.

PO4-They can maintain the honesty, compassion, level-headedness, decorum, selflessness, integrity and respect for others. Acceptance of accountability and commitment to self-improvement. They have ability to work as a member of a team and can development of leadership skills.

PO5- They can work in private and government hospitals, nursing homes/ health care settings. They also can apply in ICUs, CCUs and Emergency departments are common work places of an OT technician. They work as reliable members of health care teams under the guidance and supervision of nursing anesthetic and surgical staff during surgery.

PO6- Effect a transition of information and experiences learned in the BOTT program to employment situations and performance on the written examinations conducted by the Swami Vivekanand Subharti University.

PO7- Recognize and participate in activities which will provide current knowledge and upgrading of skills in laboratory medicine.

B.Sc. Operation Theatre Technology Honours in Anaesthesiology
(B.Sc. OTT HA) Syllabus
FIRST YEAR

PAPER-I: HUMAN ANATOMY AND PHYSIOLOGY BOTT-101

Theory	Subject Code: BOTT-101
Total Marks for Evaluation: 100	No. of Credit Hours: 120, Credits: 4

Course objective

Establish skills to identify the functions of each system of the human body, Analyze and describe the structures and functions of human anatomy and physiology from a regional perspective for the following regions: head and neck, thoracic, abdominopelvic, and upper and lower extremities.

Course Outcomes (COs)

CO 1-Understanding different terminology and recognizing organs, organ system and different sample collection site and function & structure of cells, tissues and major human organs system/parts.

CO 2- Identifying and discussing the major structures of human body and explaining the interrelation between different organ systems to maintain biological equilibrium.

CO 3- Demonstrating various organ systems and employ knowledge of human anatomy to solve questions regarding functions & diseases.

CO 4- Differentiating the various organ system and its related disorders and determining various experimental techniques related to physiology.

CO 5- Developing a holistic approach to human health and medical research.

COURSE CONTENTS:

Unit	Contents	Credit Hours
1	**Part-A (Anatomy)** **Gross Anatomy, Radiological and Surface Anatomy of Human body:** Anatomy of human body as a whole, structure of cell and tissues of body: Epithelial tissue, connective tissue, muscle tissue and nervous tissue **Classification of bones** : Axial skeleton, Appendicular skeleton, Bones - structure and functions , formation of bone, growth of skeleton, centres of ossification , fracture and dislocation, diseases of the bones , Radiological and Surface Anatomy. **Joints**: Classification of joints with examples , anatomy of various joints of head and neck, trunk and limbs **Cardiovascular system:** Anatomy of pericardium and heart, blood vessels, types of blood circulation	30
2	**Muscular system:** Types of muscles, Position and actions of chief muscles of the body **Respiratory system:** Nasal passages and para -nasal sinuses, pharynx and larynx, trachea, bronchi, lungs and pleura **Gastrointestinal system**: Parts of GIT ,oral cavity ,salivary glands, oesophagus, stomach, small and large intestine, liver, gall bladder ,pancreas . **Urinary system:** kidney, Ureters, urinary bladder and urethra **Reproductive system:** Parts of male and female reproductive system, location, functions, mammary gland **Endocrine system:** Location, structure and functions of Pituitary, Thyroid, Parathyroid, Suprarenal and Pancreas **Nervous system and sense organs:** Structure and function of Neuron, subdivisions of nervous system: central and autonomic nervous system- Parts, structure and functions, ventricles of the Brain, CSF circulation, spinal cord. Cranial nerve, Brachial	30

	plexus. **Sense Organs:** Structure and function of the eye, ear, tongue, nose, skin**.** Surface landmarks and topography of organs on the surface of body for radiographic positioning	
3	**Part-B (Physiology)** **Blood:** Its composition and function – nerve tissue- muscular tissue and types. Abnormalities in tissue-ulceration-sepsis-asepsis and antisepsis- the nature of neoplasm- common tumors-malignant tumors- dissemination of malignancy primary and secondary spread.	10
4	**Respiratory system**: Nasal passages and Para nasal sinuses-pharynx and larynx- Trachea, Bronchus and lungs. The pleura-nature and functions of respiration- common terms relating to disease and conditions of this system. Lymphatic system- lymph and tissue fluid- main glands and drainage areas in the lymphatic system- Lymphoid tissue and the tonsils. **Cardiovascular system:** General arrange, heart, arteries, veins and capillaries, heart structure and function, cardiac cycle, heart sounds, heart rate, blood pressure, mechanism of circulation, definition of hypertension and shock **Reticulo-endothelial system**: Liver and spleen- bone narrow, Life cycle of red and white corpuscles of the blood, **Alimentary systems**: Function of mouth, tongue and teeth, salivary glands- pharynx and esophagus- Stomach – small intestine (jejunum)- large intestine (colon)- Liver and Biliary tract- pancreas- functions of the alimentary system – digestion and absorption of food- metabolism- common terms used in connection with abnormalities of this system. **Urinary tract**: kidney, Ureters and bladder- urethra – urinary Excretion. **Reproductive system**: Male genitalia- Female genitalia, Mammary glands- Menstruation, pregnancy and lactation – common terms related to abnormalities of this system.	30
5	**Ductless glands (Endocrine system**): Anatomical location of pituitary, thyroid, parathyroid, adrenal, thymus, pancreas and gonads – there function, common terms related to this system. **Nervous system**: Main subdivisions, lobes and ventricles of the brain- spinal cord- meninges and cerebro- spinal fluid- common terms used in abnormalities of this system. **Organs of senses**: Structure and function of the eye – Structure and function of the ear.	20

HUMAN ANATOMY AND PHYSIOLOGY PRACTICAL

Practical	Subject Code: BOTT-101P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S No.	List of experiments	Credit Hours
1.	Histology of types of epithelium, serous, mucous and mixed salivary gland Demonstration of the glands, Histology of pituitary, thyroid, parathyroid, suprarenal glands	60
2.	Histology of the 3 types of cartilage, Demo of all bones showing parts, radiographs of normal bones and joints, Histology of compact bone (TS and LS) Demonstration of heart and vessels in the body, Histology of large artery, medium sized artery and vein, large vein, Microscopic appearance of large artery, medium sized artery and vein, large vein, pericardium,	
3.	Demonstration of parts of respiratory system, Normal radiographs of chest, Histology of lung and trachea Demonstration of parts of urinary system, Histology of kidney, ureter, urinary bladder, Demonstration of section of male and female pelvis with organs in situ, Histology of testis, vasa deference, epididymis, prostate, uterus, fallopian tubes, ovary	
4.	Demonstration of all part of brain, Histology of cerebrum, cerebellum and spinal cord, peripheral nerve and optic nerve. Histology of thin and thick skin Demonstration and histology of eyeball, Histology of cornea and retina	
5.	Haemoglobinometry, Determination of Blood Groups, White Blood Cell Count and Red Blood Count Leishman's staining and Differential WBC count, Determination of packed cell Volume	
6.	Erythrocyte sedimentation rate [ESR] and Calculation of blood indices Determination of Clotting Time, Bleeding Time	
7.	Blood pressure Recording and Determination of vital capacity. Auscultation for Heart Sounds and Artificial Respiration	

Reference Books:

1. B. D. Chaurasia, Text book for Anatomy
2. A.K. Jain, Text book for Physiology
3. Guyton, Arthur, Text Book of Physiology, Prism Publishers
4. Chatterjee, C C, Human Physiology, Medical Allied Agency
5. A.K Jain, Human Physiology
6. Anatomy & Physiology, Ross & Wilson

PAPER-II: GENERALPATHOLOGY AND MICROBIOLOGY BOTT-102

Theory	Subject Code: BOTT-102
Total Marks for Evaluation: 100	No. of Credit Hours: 120, Credits: 4

Course objective

Students get to know in depth about General Pathology and Microbiology. In this subject student learn about basics of blood and microorganism.

Course Outcomes (COs)

CO1- To understand the procedure of patient's sample collection techniques on live patients.

CO2- To analyze constituents of Blood, Urine, Body fluids and identify the various microorganism by culturing or different technique in microbiology.

CO3- Understand the disorders of blood like anemia.

Unit	Content	Credit Hours
1	**General Pathology and Haematology:** Basic steps of Acute and chronic inflammation, Types of wound, process of healing, Basics of Necrosis & apoptosis, Basics of Shock, Basics Disorders of blood coagulation system, Basics Disorders of Immune system of body, Anaemia and its classification, Leukemia and its types, Blood collection techniques, Various Anticoagulants used in Haematology, Various instruments and glassware used in Haematology, Normal constituents of Blood, their structure and function, Laboratory safety guidelines, Hb, PCV, ESR, Urine Analysis.	24
2	**Morphology and growth of microorganism and Sterilization and Disinfection:** Morphology. Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria. Growth and nutrition. Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.	24

3	**Immunology:** Immunity Vaccines, Types of Vaccine and immunization schedule Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HbsAg. Systematic Bacteriology. Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria. Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Esch coli, Klebsiella, Proteus, vibrio cholerae, Pseudomonas & Spirochetes.	28
4	**Parasitology, Mycology and Virology:** Morphology, life cycle, laboratory diagnosis of following parasites E. histolytica, Plasmodium, Tape worms, Intestinal nematodes, Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi, General properties of viruses, diseases caused lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.	24
5	**Hospital control & Biomedical waste:** Hospital infection Causative agents, transmission methods, investigation, prevention and control Hospital infection. Principles and practice Biomedical waste management.	20

GENERALPATHOLOGY AND MICROBIOLOGY PRACTICAL

Practical	Subject Code: BOTT-102P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No.	List of experiments	Credit Hours
1	Instrumentations.	60
2	Blood Collection.	
3	Anticoagulants.	
4	Hb estimation by Sahli's method.	
5	Hb estimation by Cyanmethemoglobin method.	
6	Bleeding Time	
7	Clotting Time	
8	ESR.	
9	PCV.	

10	Preparations of blood smear.	
11	Staining of smear	
12	Cells identification.	
13	WBC count	
14	RBC count	
15	Platelet count	
16	Preparation of smear	
17	Gram stain	
18	L-Bert stain	
19	Negative staining	
20	Preparation of culture media	
21	Preparation of culture plate and sticking	

Reference Books:

1. C. P. Bhaveja, Text book for Microbiology
2. Ananthnarayan Paniker, Text book for Microbiology
3. Harshmohan, Text book for Pathology
4. Tejender singh, Text book for Pathology
5. Praful B. Godkar Textbook of medical Laboratory Technology, Book Bundle

PAPER-III: MEDICAL BIOCHEMISTRY BOTT-103

Theory	Subject Code: BOTT-103
Total Marks for Evaluation: 100	No. of Credit Hours: 120, Credits: 4

Course objective

Students get to know in depth about Medical Biochemistry. In this subject student learn about chemistry of carbohydrates, lipids, enzymes, function and metabolism.

Course Outcomes (COs)

CO1- To comprehend cell structure and the function of each organelle in a cell.

CO2- To understand the basic terms of biochemistry.

CO3- Learning of basic structure, function and metabolism of biological molecules.

CO4- To discuss about biochemistry experiments, methodologies, and studies in connection to biomolecules and structures.

CO5- Learning the fundamentals of endocrine and exocrine glands and the hormones they produce.

Unit	Contents	Credit Hours
1	**Structure and Function OF Cell:** Structure and function of cell**,** Prokaryote and Eukaryote cell organization**,** Fluid Mosaic Model of cell membrane**,** Transport Mechanism**,** Acid Base Balance-maintenance**,** PH Buffers**,** Henderson – Hasselbach equation and its applications.	20
2	**Composition and Metabolism of Carbohydrate:** Types, structure , composition and function**,** Monosaccharides**,** Disaccharides, Oligosaccharides**,** Polysaccharides**,** Metabolism**,** Glycolysis**,** Gluconeogenesis**,** Tricarboxylic acid (TCA) cycle**,** Pentose phosphate pathways (HMP)**,** Regulation of blood glucose level**,** Glucose investigations and their interpretations	20
3	**Composition and Metabolism of Lipids:** Types, Structure, Composition and function of fatty acids**,** Nomenclature, Roles and Prostaglandins**,** Triacylglycerols, phospholipids, Cholesterol**. Metabolism of fatty acid**: Breakdown**,** Synthesis **Biosynthesis & its regulation:** Bile salts & bilirubin**,** Vitamin D Lipoproteins and their functions, Transport of lipids, VLDLs, LDLs, HDLs, Atherosclerosis, Investigations and their interpretations	30
4	**Composition and Function of Amino Acids and Proteins:** Types, structure, composition and function of amino acid**,** Structural organization of proteins (basic understanding only)**,** Classification and functions of proteins, Denaturation and Coagulation**,** Metabolism of Nitrogen**,** Fixation and Assimilation**,** Urea cycle **Enzymes and Hormones:** Enzymes and Co-enzymes**,** Classification and function**,** Factors effecting enzyme action, Coenzyme and Cofactor **Glands:** Exocrine and Endocrine, Hormones, Investigations and their interpretations	30
5	**Radioactivity:** Radioactivity**,** Radioisotopes**,** GM Counter**,** Colorimeter and Spectrophotometer**,** Chromatography**,** Electrophoresis**,** RIA**,** ELISA	20

MEDICAL BIOCHEMISTRY PRACTICAL

Practical	Subject Code: BOTT-103P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S No.	List of Experiments	Credit Hours
1.	Analysis of Normal Urine	60
2.	Liver Function tests	
3.	Lipid Profile	
4.	Renal Function test	

5.	Blood gas and Electrolytes	
6.	Demonstration of Glucometer with strips	

Reference Books:

1. Das, Debajyothi, Biochemistry, Academic Publishers, Calcutta.
2. Chatterjee, A Text book of Medical Biochemistry
3. Satyanarayan, U., Medical Biochemistry
4. Textbook of Medical Laboratory Technlogy: Praful B. Godkar, Darshan P. Godkar: Third Edition: ISBN: 9789381496190, 93811496196: 2014.
5. Dacie and Lewis Practical Haematology; Barbara J. Bin, Imelda Bates, Michael A. Laffan; Twelfth Edition; ISBN- 9780702069307, 9780702069307; Elsevier Health Sciences;
6. Practical Haematology; Sir John Vivian Dacie, Shirley Mitchell Lewis; 8th Edition; Churchill Livinstone, 1995; 1 august 2008; ISBN- 0443049319, 97804430493116.

PAPER-IV: INTRODUCTION TO OPERATION THEATRE TECHNOLOGY BOTT-104

Theory	Subject Code: BOTT-104
Total Marks for Evaluation: 100	No. of Credit Hours: 120, Credits: 4

Course objective

In this subject student learns about different kinds of operation theatre techniques and procedures. Students also able to identify surgical tools used in different surgical procedure.

Course Outcomes (COs)

CO1- To acquire knowledge of the responsibilities of the operating room, surgical tools, and equipment. They could work with the surgeons to coordinate.

CO2- Maintain the lab's equipment and take care of its upkeep.

CO3-Knowledge of general tool care and testing, including hemostatic forceps, needles, holders, knives, and scissor.

CO5- A brief overview of the many types of anesthesia and its methods.

Unit	Content	Credit Hours
1	**Central Sterile Supply Department (C.S.S.D) and logistics**: Cleaning and dusting - methods of cleaning, composition of dust. General care and testing of instruments- hemostatic forceps, needle, holders, Knife, blade, scissor, use/ abuse, care during surgery.	24

2	**Disinfection and sterilization:** Definition, Methods cleaning agents' detergents, Mechanical washing, ultrasonic cleaner, lubrication inspection and pitfalls Various methods of chemical treatment- formalin, glutaraldehyde, thermal.	20
3	**Sterilization of instrument and equipment:** Hot Air oven- dry heat, Autoclaving, Steam Sterilization, UV treatment, Instrument's Etching, Care of micro surgical and titanium instruments, Sterilization of equipment - Arthroscopy, Gastro scope, imago Lamp, apparatus, suction apparatus, anaesthetic equipment, Endotracheal tubes.	24
4	**Operation Theatre (OT) Sterilization:** Laminar Air flow Trouble shooting, Colored spots and corrosion**,** Staining**,** Dust deposit**,** Recent amendment in EPA with reference to waste disposal.	24
5	**Anaesthesia care and OT-techniques:** Anaesthesia Service, History, pre-operative, Intra operative & post operative care, General Anaesthesia Techniques, Local Anaesthesia Techniques, Blood Transfusion, Monitoring in the Operation Theatre**,** Positioning of Patient, Instrument planning for various surgical procedure and Auxillary instrumentation, O.T. Techniques. O.T. environment, control of infection scrubbing, theatre cloths including lead apron and goggles, Duties of Nurses - Ethics, behaviour during surgery, etc.	28

INTRODUCTION TO OPERATION THEATRE TECHNOLOGY PRACTICAL

Practical	Subject Code: BOTT-104P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	Various Techniques of Injection –Advantages and Disadvantages	60
2	Crystalloids and colloids	
3	Medical Gas delivery Devices, DISS,PISS, Oxygen concentrator	
4	Techniques of insertion of peripheral IV line	
5	Blood products, Pretransfusion checks, transfusion reactions	

Reference Books:

1. Prescott, Harley and Klein's Microbiology, by Willey JM, Sherwood LM and Woolverton CJ, McGraw 2. Hill Higher Education 8th Ed, 2011
2. Microbiology: An Introduction by Tortora GJ, Funke BR and Case CL., Person Education, 9th Edition, 2008.
3. Microbiology by PelczarJr MJ, Chan ECS and Krieg NR. Tata McGraw Hill, 5th Ed, 2011 (Reprint).
4. Microbiology: Principles and Explorations, Black JG Prentice Hall 7th edition,2008.
5. General Microbiology, Stanier RY, Ingraham JL, Wheelis ML and Painter PR. McMillan Publishing, 5th Edition 2005.
6. Understanding Bacteria, Srivastava S and Srivastava PS,Kluwer Academic Publishers, 2003.
7. Microbiological Applications Laboratory Manual in General Microbiology, Benson, The McGraw Hill Companies, 8th Edition

PAPER-V: COMPUTATIONAL SKILLS AND BIOSTATISTICS BOTT-105

Theory	Subject Code: BOTT-105
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

Students get to know in depth about Computer and biostatistics. In this subject student learn about basic computer fundamentals, use of network terminology and calculate the central tendency and use different test of significance.

Course Outcomes (COs)

CO1- Learn about the principles of computers, data representation, network jargon, multimedia, and problem-solving using Excel, Word, Power point, Email, and Office, among other things.

CO2- The programmed going to describe allows students to specialize in areas including biostatistics, statistical theory and analysis, probability, and interdisciplinary application fields.

CO3- Identify and contrast the main families of computer programming languages.

CO4- Locate and use programming materials online.

CO5- Control basic programmed input and output

Unit	Contents	Credit Hours
1	**Part A: COMPUTATIONAL SKILLS** **Computer Fundamentals:** Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers. **Basic Computer Organization -** Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices. User Interface with the Operating System, System Tools **Data Representation:** Binary representation of integers and real numbers, 1's Complement, 2's Complement, Addition and subtraction of binary numbers, BCD, ASCII, Unicode	30
2	**Networks terminology:** Types of networks, router, switch, server-client architecture **Multimedia:** Introduction, Characteristics, Elements, Applications	20
3	**Problem Solving:** Notion of algorithms, stepwise methodology of developing an algorithm, developing macros in spreadsheet. M.S. Office: word, excel, power point, Internet, e-mail, search engine, **General Awareness :** IT Act, System Security (virus/firewall etc.),	25

	I-Tax, Reservations, Banking.	
4	**Part B: Biostatistics** **Measure of central tendency**: Mean, median and mode and their relationship. **Measure of dispersion:** quantitative deviations, mean deviation, standard deviation, coefficient of variations. Concept of Standard errors.	25
5	**Tests of significance**: Hypothesis testing (null and alternative hypothesis) **Tests of significance (non-parametric**): T- test and Chi-square test for independence; P-value of the statistic; Confidence limits	20

COMPUTATIONAL SKILLS AND BIOSTATISTICS PRACTICAL

Practical	Subject Code: BOTT-105P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S.No.	List of Experiments	Credit Hours
1	Collection and tabulation of data	60
2	Graphical representation of data	
3	Correlation and regression analysis	
4	Student's 't' test	
5	Chi-square test	
6	ANOVA	
7	Use of MS EXCEL	
8	Use of in-built statistical functions for computations Mean, S.D., Correlation, regression coefficients	
9	Use of bar diagram, histogram, scatter plots, etc.	
10	Graphical tools in EXCEL for presentation of data	

Reference Books:

1. Fundamentals of Biostatistics Bernard Rosner 5th Edition, Duxbury Thomson Learning, 8th, Ed, (2015)
2. Introductory Biostatistics, Chap T. Lee, Wiley, 1st Ed., (2003)
3. Comdex computer course kit, Vikas Gupta, Dreamtex press ND.
4. Introduction to computer, Pooja Jai n and Neelam Kumari, Vikas publishing house Pvt ltd.
5. Biostatistics for medical students and research workers 9th Ed., Bratati Banerjee, Jaypee Brthors Medical Publishers.

PAPER-VI: GENERAL ENGLISH AND COMMUNICATION SKILLS BOTT-106

Theory	Subject Code: BOTT-106
Total Marks for Evaluation: 100	No. of Credit hours: 60, Credits: 4

Course objective

Enabling the students to cultivate and develop reading, writing habit to enhance their vocabulary. The basic objective of this course is to develop communication skills necessary for effective management and raising betterment of organization.

Course Outcomes (COs)

CO1- To comprehend with medical professionals that are fluent in English.

CO2- To engage in confident conversation with the public.

CO3- To accurately recall the jargon and acronyms used in international medicine.

CO4- Students can read and evaluate case studies and medical histories.

CO5- Students are able to write more skillfully.

Unit	Content	Credit Hours
1	**Essentials of grammar:** Part of speech, noun, pronoun, adjective, verb, preposition, articles, Sentences (kind) transformation of sentences, tense (present, past, future)**,** Active and passive, Direct and indirect, Vocabulary, synonyms, antonyms, idioms and phrase, one word substitution.	22
2	**Technical writing skills:** Definition, requisites of good paragraph writing, scientific writing skills and forming abstracts, Reading comprehension skills, passage for communication (oral), Effective listening, importance of listening and hearing, Letter writing: official letters, business letters, personal letters.	28
3	**Interview tips:** what student is supposed to do before the interview, during the interview and after the interview and on, Importance of non-verbal communication, debates, role-plays, corporate behavior, office etiquettes, Importance of body language, Group discussion (G.D.), G.D. tips	25

4	**Report writing skills:** Types of reports, layout of formal report, scientific writing skills, problems while writing a scientific report/document. Plagiarism, element of scientific paper, abstract writing, Internet as a medium of interaction. Effective e-mail strategy using the right tone and conciseness, Presentation skills: Formal presentation skills, Preparing and presenting using Over Head Projector, Power Point presentation, Defending Interrogation; Scientific poster preparation and presentation; Participating in group discussions.	25
5	**Presentation skills:** Importance of Presentation Skills, Capturing Data, Voice and Picture Integration, Guidelines to make Presentation Interesting, Body Language, Voice Modulation, Audience Awareness, Presentation Plan, Visual Aids, Forms of Layout, Style of Presentation.	20

Reference Books:

1. Wren and Martin H- "High school grammar and composition" S. Chand and co
2. Robbins's "organization behavior"
3. Sharma R C and Krishan Mohan – Business correspondence and report writing. New Delhi Tata mcgram hill
4. Banerji, Meera and krisan Mohan- Developing communication skills, Macmillan publishers India
5. Raman ,Meenakshi and Shasme Sangeeta- "Technical communication – principles and practices " Oxford University Press
6. Mohan Krishna and N.P. Singh, Speaking English effectively, 2nd edition, Macmillan, 2009.
7. Allen R., How to Write Better English, Penguin Writers' Guides, 2005.
8. Ros Jay and Antony Jay, Effective Presentation: How to Create and Deliver a Winning Presentation, Financial Times Prentice Hall; 2nd Edition, 1999.
9. Robert A. Day, How to Write & Publish a Scientific Paper, 5th Edition, Oryx Press; 5th Edition, 1998.

SECOND YEAR

PAPER-I: APPLIED ANATOMY AND PHYSIOLOGY (BOTT- 201)

Theory	Subject Code: BOTT- 201
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

Students gain fundamental knowledge and insight of details of human body. They also to understand the detailed physiology of various systems of human body.

Course Outcomes (COs)

CO1- Develop the ability to recognize and describe the body structures and their function.

CO2- Knowledge about anatomy of body with the function of each organ.

CO3- The practical aspects of organs, bones, tissues, nerves, etc. are available for study by students.

CO4- Description of various disease related to the anatomy of body.

CO5- Applied anatomy of the pelvic, head and neck, thorax, abdomen, upper and lower limbs is described.

Unit	Content	Credit Hours
1	**Body Limbs, Head and Neck :** Bones, joints, muscles, vessels, lymphatic drainage and nerves**,** Hand, forearm, arm, shoulder, pectoral girdle, breast, axillary and scapular region**,** The anatomy of extensile exposures of the bones and joints of the upper limb**,** The anatomy related to surgical management of breast carcinoma**,** The anatomy of brachial plexus injuries and its clinical signs **,** The anatomy of the rotator cuff injuries, The anatomy of entrapment neuropathies**,** Foot, lower leg, thigh, gluteal region**,** The anatomy of surgical approaches to the hip joint, knee joint and ankle joint**,** The anatomy of vascular anastomosis of the lower limb for trauma and atherosclerosis**,** The anatomy of the lower limb as it relates to external fixation, The anatomy of the knee injuries**,** Scalp, skull, cerebrum, cerebellum, mid brain, brain stem, Face, eyes, ears, nose, Mouth, pharynx, larynx, Neck, Bones, joints, muscles, vessels, nerves and cranial nerves, Anatomy related to skull fractures and complications, Anatomy of cerebral circulation, Anatomy of facial palsies, Anatomy of ocular palsies, Anatomy of facial fractures and complications, Anatomy of the larynx as it related to deglutition, respiration, and intubations, Anatomy of thyroidectomy and complications, Anatomy of the movement of the neck, Anatomy as it relates to cervical spine injuries, Anatomy of lymphatic drainage of head and neck malignancies.	28
2	**Thorax, Abdomen, Pelvis and Spine:** Chest wall, Ribs, diaphragm, Airways and lungs, Heart and great vessels, Mediastinum, Anatomy of thoracic surgical	24

	approaches, Anatomy of congenital malformations, The circulatory anatomy of the heart and lungs related to bypass surgery, Abdominal wall and peritoneum, Liver, spleen, intestines, pancreas, kidneys and ureters, Aorta and vessels, Anatomy of inguinal ligament and hernia repair, Anatomy of common surgical procedures: cholecystectomy, gastrectomy, Appendicectomy, colectomy, bowel resection, nephrectomy, Anatomy of congenital malformations, Abdominal vascular anatomy, Bones, joints, muscle nerves, vessels, Urinary and reproductive organs, Congenital malformations, Anatomy of urolithiasis and surgical treatment, Vertebral column, Spinal cord and nerves, Anatomy of traumatic paraplegia.	
3	**Tissue Structures and Embryology:** Skin, mucous membrane, subcutaneous tissue, deep fascia, Muscles, tendons, ligaments, joints, cartilage, Peripheral nerves, vessels and lymphatic, Anatomy of common pedicle and free flaps, Anatomy of surgical skin incisions, Basic Embryology of limbs and spine Notochord, mesoderm, endoderm, limb formation, Comparative Anatomy of the Child - Epiphyseal plates, proportions, growth, Osteology of the child.	20
4	**Cardiovascular and Respiratory system:** Heart-Physiological Anatomy, Nerve supply, Properties of cardiac muscle, Cardiac Cycle-Events –systole, diastole, Cardiac Output, Definition and factors affecting it, Heart sounds-normal heart sounds, its causes, areas of auscultations, Blood Pressure-Definition, normal value, Physiological variations, its measurement, ECG- normal waves, Shock Definition, Types, Physiological Anatomy, Functions of the respiratory system, Types of respiration, respiratory membrane, Lung volumes and capacities, vital capacity and factors affecting it, Transport of Oxygen-Forms of transportation, Oxy-hemoglobin dissociation curve and factors affecting it, Transport of Carbon-Dioxide- Forms of transportation, Hypoxia-Definition, types, effects of hypoxia, Cyanosis, Definition and types, Artificial Respiration- CPR.	24
5	**Central Nervous System and Nerve Muscle Physiology:** Structure of neuron, functions of nervous system, Classification and properties of nerve fibers, Synapse- structure and types, Receptors-Definition, classification, properties, Reflex Arc, Ascending and Descending tracts- names and functions, Functions of Hypothalamus, Functions of Cerebellum and Basal Ganglia, Functions of Cerebral Cortex, Autonomic Nervous System- Actions of sympathetic and parasympathetic system and their comparison, Special Senses-Eye-structure, functions of different parts, Visual acuity, Refractive errors Ear-structure, functions, General mechanism of hearing**.**	24

APPLIED ANATOMY AND PHYSIOLOGY PRACTICAL

Practical	Subject Code: BOTT-201P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	Demonstration of all bones of the human body.	
2	Demonstration of all organs of the human body.	

3	Estimation of Hemoglobin Concentration	60
4	Determination of Bleeding Time and Clotting Time	
5	Determination of Blood Groups	
6	Recording of normal Blood Pressure	
7	Clinical Examination of Arterial Pulse	
8	Determination of Vital Capacity	

Reference Books

1. Chummy S Sinnatamby. Last's Anatomy: Regional and Applied. 11th Edition. Churchill Livingstone Elselvier.
2. Susan Standring. Gray's anatomy: the anatomical basis of clinical practice. 39th Edition. Churchill Livingstone Elselvier.
3. Frank H Netter. Netter's Concise Atlas of Orthopaedic Anatomy. Sounders.
4. Richard S Snell. Clinical Anatomy
5. R. Vinoda, Text book for Applied Physiology
6. Ross and Wilson, Anatomy and Physiology, Chruchill Livingstone.
7. Companion Pocketbook for quick review
8. B.D. Chaurasia's Human Anatomy -Vol. (1,2,3)
9. Anatomy for B.Sc. Nursing – Dr Renu Chauhan

PAPER II: CLINICAL PHARMACOGY BOTT-202

Theory	Subject Code: BOTT-202
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

In this subject student learn about different aspects of pharmacological procedure of different drugs and categories of drugs with their action.

Course Outcomes (COs)

CO1- The learner should be able to comprehend how drugs are frequently used by the end of the course.

CO2: Using a lecture and demonstration, integrate the idea of rational drug therapy into clinical pharmacology.

CO3: To learn about cardiovascular medications, anesthetics, analgesics, antihistamines, and antiemetics, as well as their definitions and classifications.

CO4: Pharmacology description of organ protection during CPB.

CO5- To learn briefly about the definition, categorization, and workings of antimicrobial agents and infection chemotherapy.

Unit	Content	Credit Hours
1	**Basics of Pharmacology:** General concepts about pharmacodynamic and Pharmacokinetics, Principles involved in drug activity.	20
2	**Autonomic nerves system:** Anatomy & functional organization, List of drugs acting on ANS including dose, route of administration, indications, contra indications and adverse effects.	20
3	**Drugs and its types:** Enumerate the mode of action, side effects and therapeutic uses of the drugs, Antihypertensive, Beta Adrenergic antagonists, Alpha Adrenergic antagonist, Peripheral Vasodilators, Calcium channel blockers, Antiarrhythmic drugs, Cardiac glycosides, Sympathetic and non-sympathetic inotropic agents, Coronary vasodilators, Antianginal and anti-failure agents, Lipid lowering & anti atherosclerotic drugs, Drugs used in Hemostasis - anticoagulants Thrombolytics and anti-thrombolytics, Cardioplegic drugs- History, Principles and types of cardioplegia, Primary solutions - History, principles & types, Drugs used in the treatment of shock, Definition of general and local anaesthetics, Classification of general anaesthetics, Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents, Intravenous general anaesthetic agents, Local anaesthetics classification mechanism of action, duration of action and methods to prolong the duration of action, Preparation, dose and routes of administration, Analgesics definition and classification, Routes of administration, dose, frequency of administration, side effects and management of nonopioid and opioid analgesics, Antihistamines and Antiemetics classification, Mechanism of action, adverse effects, Preparations, dose, routes and administration, CNS stimulants and depressants, Alcohol, Sedatives, hypnotics and narcotics, CNS stimulants, Neuromuscular blocking agents and muscle relaxants, Pharmacological protection Inhalation gases, Protection of organs during CPB , Inhalational gases and emergency drugs, Corticosteroids classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration, Diuretics and renal physiology, Side of action of diuretics and its adverse effects, preparations, dose and routes of administration, IV fluids- various preparations and their usage, Electrolyte supplements, Immunosuppressive agents. New drugs included in perfusion technology, Drugs used in metabolic and electrolyte imbalance.	30
4	**Pharmacotherapy of respiratory disorders:** Introduction - Modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone, Pharmacotherapy of bronchial asthma, Pharmacotherapy of cough, Mucokinetic and mucolytic agents, Use of bland aerosols in respiratory care.	25
5	**Chemotherapy of infections:** Definition**,** Classification and mechanism of action of antimicrobial agents**,** Combination of antimicrobial agents**,** Chemoprophylaxis, Classification, spectrum of activity, dose, routes of administration and adverse effects of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, anti-tubercular drugs.	25

CLINICAL PHARMACOGY PRACTICAL

Practical	Subject Code BOTT-202P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	Preparation and prescription of drugs of relevance.	60
2	Preparation and dispensing of powders, emulsions ointments, mixtures, liniments, suppositories and syrups	
3	Experimental pharmacology directed to show the effects of commonly used drugs of relevance and interpretation of few charts.	
4	Exercises on drug interactions	

Reference Books

1. R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18Edition, single Volume, M/S Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay.
2. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post Box, 7193, G-16, EMCA House, 23/23, Bansari Road, Daryaganj, New Delhi.
3. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.
4. Basic Life Support (BLS) - American Heart Association guidelines
5. Lee's Synopsis of Anesthesia-13th edition

PAPER-III: CLINICAL PATHOLOGY AND APPLIED MICROBIOLOGY BOTT-203

Theory	Subject Code: BOTT-203
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

This subject deals with the different procedures used in pathology. This subject covers the various microorganism, their identification and the sterilization process.

Course Outcomes (COs)

CO1- Study about tissue processing for the diseased tissue.

CO2- Students can learn about blood banking and the various techniques used in blood banks for blood transfusions.

CO3- Students are able to comprehend how to collect samples and proceed with them using various methods, such as smear preparation in applied microbiology.

CO4- The necessity of sterilization, infection control procedures for intensive care units, preparation of materials for autoclaving, and other topics will be covered in the course on health care-related infections and antibiotic resistance.

Unit	Content	Credit Hours
1	**Histopathology and Cytopathology:** Instrumentation**,** Receiving of samples, Tissue processing, Fixation**,** Grossing of histopathological specimen, Embedding/Blocking, Section cutting, Decalcification**,** Haematoxylin and Eosin stain**,** Special staining in histopathology, Museum technique**,** Papanicolaou (PAP) smear &Staining, Giemsa Staining**,** Fine Needle Aspiration Cytology (FNAC).	20
2	**Blood Banking:** Introduction, Blood bank introduction, Blood bank set up and functioning, Screening in blood bank, Coomb`s test, Rh antibody titre, Common and rare blood group, Genetics of blood group, Cross matching, Components preparation, its storage and transportation, Blood storage and transportation, Blood components, Transfusion reaction & its complication, Blood transfusion reaction.	22
3	**Infection acquired during Operation Theatre:** Health care associated infections and Antimicrobial resistance**,** Infections that patients acquire during the course of receiving treatment for other conditions within a healthcare setting like Methicillin Resistant Staphylococcus aureus infections**,** Infections caused by Clostridium, Vancomycin resistant enterococci etc. Catheter related blood stream infections, Ventilator associated pneumonia, Catheter related urinary tract infections, Surveillance of emerging resistance and changing flora, The impact and cost attributed to Hospital Associated infection.	24
4	**Hospital acquired disease:** Disease communicable to Healthcare workers in hospital set up and its preventive measure: Occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicella zoster, respiratory syncytial virus etc.), Blood borne transmission (HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc.), Oro fecal route (Salmonella, Hepatitis A etc),direct contact (Herpes Simplex Virus etc). Preventive measures to combat the spread of these infections by monitoring and control, Microbiological surveillance and sampling: Required to determine the frequency of potential bacterial pathogens including Streptococcus pneumoniae, Haemophilus influenzae, andMoraxella catarrhalis and also to assess the antimicrobial resistance. Sampling: rinse technique, direct surface agar plating technique.	30
5	**Sterilization and its importance:** Disinfection of instruments used in patient care: Classification, different methods, advantages and disadvantages of the various methods, Disinfection of the patient care unit, Infection control measures for ICU's, Rooms: Gaseous sterilization, One Atmosphere Uniform Glow Discharge Plasma (OAUGDP), Equipments: classification of the instruments and appropriate methods of sterilization, Central supply sterile department: the four areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas, Preparation of materials for autoclaving: Packing of different types of materials, loading time and unloading.	24

CLINICAL PATHOLOGY AND APPLIED PRACTICAL

Practical	Subject Code: BOTT-203P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	Instrumentations.	60
2	Cells identification.	
3	WBC count.	
4	RBC count.	
5	Platelet count.	
6	Blood Group.	
7	Cross match and Coomb's test	
8	Knife Sharpening.	
9	Tissue Processing.	
10	Embedding.	
11	Section Cutting.	
12	H&E stain.	
13	Study of normal and cancer cells.	
14	Principles of autoclaving & quality control of Sterilization.	
15	Collection of specimen from outpatient units, inpatient units, minor operation theater and majoroperation theater for sterility testing.	
16	The various methods employed for sterility testing.	
17	Interpretation of results of sterility testing.	
18	Disinfection of wards, OT and Laboratory.	

Reference Books

1. P. B. Godkar, Text book for MLT
2. Harsh Mohan, Text book for Pathology
2. Textbook of Microbiology by Ananthnarayan and paniker
3 Textbook of hospital infection control by Purvamathur
4. Textbook of Microbiology by Baveja
5. Hospital infection control by Mayhall

PAPER IV: MEDICAL ETHICS AND OPRATION THEATRE INSTRUMENTS BOTT-204

Theory	Subject Code: BOTT-204
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

This subject covers ethical knowledge and concern the way of interaction to patient and their attendants. Students also able to understand the details of various instruments used in operation theatre.

Course Outcomes (COs)

CO1- Study the general ethical considerations that apply to scientific research, and use a variety of research techniques.

CO2- Special attention should be paid to medical ethics, including issues of permission, confidentiality, and mental health.

CO3- Basic understanding of instruments used in operation theatre.

Unit	Content	Credit Hours
1	**General & special Considerations of Medical Ethics:** Medical Ethics – Introduction, Three Cor Contents in Medical Ethics – Best, Interest, Autonomy Uprights, Doctors, Patient & Profession, Special Considerations of Medical Ethics, Consent, Confidentiality, Genetics, Reproductive Medicine, Mental Health, End of life and Organ Transplantation, Research & Clinical Trials.	24
2	**AIRWAYS:** Types, Sizes, insertion technique, Insertion of SGADs (LMA, I - Gel etc.) Oropharyngeal / Nasopharyngeal airways, sizes, colour coding, insertion techniques, airway adjunct, stylites, supra glottic airway devices, bougies, light wand.	20
3	**Laryngoscopes, Laryngoscopy and Endo tracheal Tubes:** Parts Procedure and maintenance, types, sizes, blades, Fiber optic laryngoscope, video laryngoscope, parts, types, sizes, specialized ETTs.	18
4	**Incubation and Techniques:** Technique of endotracheal intubation- Checking tube position, complications, cuff inflation and pressure, Sellick maneuver, BURP Technique ,Double lumen tubes (DLT), bronchial blockers, Difficult Intubation Trolley, Tray Types of Oxygen masks, oxygen therapy ,Anesthesia circuits – uses, advantages, disadvantages, checking of various circuits, maintenance , Anesthesia machines and work stations, ventilators: parts, functioning, checking, maintenance, servicing alarms and safety devices.	28
5	**Equipments and uses:** Tracheostomy- tubes, types, sizes, decannulation procedure, Spinal and Epidural Needles, epidural catheters: Sizes, types, colour coding, Epidural catheters. Preparation for the procedure, content of the set, indications, complications, Suction Catheters- types, sizes, colour coding, uses Syringe pumps and infusion pumps, PCA Pumps- functioning, handling maintenance, alarms and safety features Monitoring Devices- SPo2, Pulse oxymetery, ETCo2, NIBP, IBP- Preparation of OT, checking of anesthesia machine, monitors and drugs, IV fluids- appropriate doses with labelling for general and regional anesthesia services for various surgical procedure, Post-operative Nausea & Vomiting, Sore throat, Laryngeal granuloma, Neurological complications. Awareness Vascular complications. Trauma to teeth, Headache, Backache, Ocular complications - Auditory complications Asepsis in OT: Importance of OT Asepsis, Aseptic techniques, OT sterilization procedures, how to handle HIV, HCV, HBsAg positive cases in OT, PPE	30

MEDICAL ETHICS AND OPERATION THEATRE INSTRUMENTS PRACTICAL

Practical	Subject Code: BOTT-204P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	Preparations of drugs and trolley for Anaesthesia	60
2	Dilutions of different drugs, proper labelling	
3	Differences between subarachnoid and epidural anaesthesia	
4	Calculation of doses of various important drugs used during perioperative period	
5	Calculation of dose from various % strengths Gram, mg, mcg; relationship and conversions	
6	Insertion and care of airways	
7	Assessment of sizes of ETT	
8	Difficult airway trolley and checking for anesthesia machine and circuits Procedure for IV cannulation	
9	Insertion of Foley's catheter, NG tube Calculation of ml of drug required from a given % of drug Method of holding resuscitation mask, triple airway maneuvers	
10	General surgical instruments and used	
11	Diathermy machine	
12	Defibrillator	
13	Methods of cleaning instrument	

Reference Books

1. Medical Ethics & Law, The Cor Curriculum
2. Author -Tony Hope Atla
3. Reference book No. 16715 Center Library
4. K.R.Sundaram, S.N.Dwivedi and VSreenivas (2010), Medical Statistics, Principles and Methods, BI Publications Pvt Ltd, New Delhi
5. NSN Rao and NS Murthy (2008), Applied Statistics in Health Sciences, Second Edition, Jaypee Brothers Medical Publishers (P) Ltd.
6. J.V.Dixit and L.B.Suryavanshi (1996), Principles and practice of Biostatistics, First Edition, M/S BanarsidasBhanot Publishers.
7. Getu Degu and Fasil Tessema (2005), Biostatistics, Ethiopia Public Health Training Initiative.
8. Essentials of Community Medicine for Allied Health Sciences, JSS University Publications, 20.
9. Park K. Park's Textbook of Preventive and Social Medicine. 23rd ed. Jabalpur: BanarsidasBhanot Publishers, 2015. p.135-141.
10. Suryakantha. Textbook of Community medicine with recent advances.3rd edition.
11. Bhalwar R. Textbook of Public Health and Community Medicine. 2nd Edition. Pune, Department of Community Medicine AFMC, 2012.
12. LeonGordis. Epidemiology Fourth Edition - Elsevier Saunders Publication.

PAPER- V: CENTRAL STERILE SUPPLY DEPARTMENT (CSSD) TECHNIQUE AND NURSING PROCEDURE BOTT- 205

Theory	Subject Code: BOTT-205
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

This subject deals with procedures performed in the Central sterile supply department and various techniques used in the nursing procedures.

Course Outcomes (COs)

CO1- Learn about hand washing, material preparation and cleaning, sterilization, sterilizer loading, personal protective equipment, fundamentals of disinfection, and sterilization process failures.

CO2- Understanding waste management.

CO3- To information acquired through the use of critical thinking, discernment, and skill, such as monitoring temperature, pulse, blood pressure, and breathing; administering different types of injections, oxygen therapy, and nebulization; and caring for patients who are unconscious.

CO4- To discuss the use of a holistic approach to care that takes into account the patients' biological, psychological, social, and spiritual requirements.

Unit	Content	Credit Hours
1	**Basics of Sterilization in operation theatre Introduction:** Physical areas and personnel of the sterilization plant**,** Personal protective equipment**,** Hand washing**,** Cleaning of materials**,** Preparing and packaging materials, Basic guidelines for disinfection and sterilization, Disinfection, Sterilization, Loading and transportation of sterilizer, Correctly loading the sterilizer**,** Handling, transporting and storing materials**,** Methods for controlling the sterilization process**,** Failures in the sterilization process**,** Validating the sterilization process.	28
2	**Quality indicators and Waste management:** Quality indicators for the sterilization plant, Re-use of a single use medical device, Environmental cleaning and disinfection of the sterilization plant, Occupational hazards, Waste management, Terms related to sterilization.	24
3	**Physical Examination in OT:** Temperature monitoring & Fever, Pulse monitoring, BP monitoring, Respiration monitoring.	20
4	**Injections and their routes:** Types of Injection routes, IM Injection, IV Injection, SC Injection, Oxygen Therapy.	24
5	**Care of patient**: Nebulization, IV Infusion (Also with infusion pump.), Care of Unconscious patient.	24

CENTRAL STERILE SUPPLY DEPARTMENT (CSSD) TECHNIQUE AND NURSING PROCEDURE PRACTICAL

Practical	Subject Code: BOTT-205P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	Organization of CSSD	60
2	Cleaning, disinfection, decontamination, sterilization techniques	
3	Antiseptics and Disinfectants	
4	Functioning of Autoclave, stages of autoclaving	
5	Critical, semi critical, noncritical devices & methods of Disinfection / sterilization Cleaning & sterilization of OT	

Reference Books

1. Principles and Practice of Nursing - Sr Nancy
2. Introduction to Critical Care Nursing - Mary Lou Sole
3. First Aid - Redcross Society Guidelines
4. Basic Life Support (BLS) - American Heart Association guidelines
5.Principles and Practice of Nursing Sr. Nancy- N.R. Publishing House

THIRD YEAR

PAPER-I: MEDICINE RELEVANT TO OPERATION THEATRE BOTT-301

Theory	Subject Code: BOTT-301
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

In this subject student learns about different medicine used during the procedures in operation theatre, Students also learn about various types of disease with their medication.

Course Outcomes (COs)

CO1- To comprehend the fundamental principles, elements, and applications of medicines.

CO2-Knowledge of standard clinical terminology, history-taking, and general patient assessment.

CO3- Definition, pathophysiology, clinical characteristics, examination, and management of hypertension and hypotension.

CO4- The fundamentals of blood disorders, diabetes mellitus, urinary tract, pulmonary, and GIT diseases—their pathogenesis, clinical characteristics, and treatment.

Unit	Content	Credit Hours
1	**General examination of the patient:** History taking**,** Filling case –sheet**,** Common clinical words.	20
2	**Blood disorders:** Hypertension: - Definition, causes, pathology, clinical features, investigation and management, Hypotension: - Definition, causes, pathology, clinical features, investigation and management, Anaemia**,** Basics of coagulation Bleeding disorders &Hemophilia.	24
3	**Disease of Thoracic, abdomen and pelvis region:** Pneumonia**,** Tuberculosis**,** Bronchial asthma**,** COPD**,** Bronchiectasis**,** Collapse of lung**,** Pneumonitis**,** Pleural effusion**,** Pneumothorax**,** Emphysema thoraces**,** Cancer lung. **,** Reflux Esophagitis **,**Peptic ulcers**,** Gastritis**,** Intestinal Obstruction**,** Hepatitis**,** Cirrhosis of liver**,** Cholecystitis**,** Appendicitis**,** Hernia**,** Piles**,** Fissure**,** Fistula Pancreatitis**,** Pancreatic Cancer **,** Urolithiasis**,** Benign prostatic, hyperplasia**,** Hydrocoele**,** Cancer prostate**,** Urethral stricture**,** Hypo & epi-spadias.	28
4	**Diseases of Nervous and endocrine system:** Stroke, Meningo-encephalitis, Glasgow coma scale, Epilepsy, Head Injury., Diabetes mellitus, Hypo & Hyper thyroidism, Hypo & Hyper, Natremia, Hypo & Hyper kalaemia, Hypo& Hyper Calcaemia.	24
5	**Infectious diseases:** Tuberculosis, Typhoid**,** Malaria**,** Dengue fever**,** Leprosy**,** AIDS**,** Amoebiasis.	24

MEDICINE RELEVANT TO OPERATION THEATRE PRACTICAL

Practical	Subject Code: BOTT-301P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S No.	List of Experiments	Credit Hours
1	Measurement of blood pressure, sitting, standing and after exercise	60
2	Investigation of anemia by different methods	
3	ZN staining	
4	Investigation of Typhoid, Malaria parasite	
5	Serological investigation (HIV, HCV and HBsAg)	

Reference Books:

1. Davidson's Principles and Practice of Medicine - Elsevier Publications
2. Harrison's Principle of Internal Medicine
3. SRB's Manual of Surgery Sriram Bhat M- Jaypee Brother Publishers
4. Textbook for Operation Room Technician Pramilla Bhalla- Ahuja
5. Essential of Medical Pharmacology KD Tripathi- Jaypee Brother Medical Publishers

PAPER-II: **BASICS OF SURGERY BOTT-302**

Theory	Subject Code: BOTT-302
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

In this subject student's study about different surgeries and their complications. Students also able to understand which instrument and equipment is used in different surgeries.

Course Outcomes (COs)

CO1- Learn about the fundamentals of surgery, including head injuries cerebral bleeding,

CO2 - Research the causes, symptoms, and PIVD/Potts spine.

CO3- Learn the fundamentals of fracture treatment.

CO4- To describe pediatric surgery, prolapsed uterus, fibroid uterus, and cancer uterus.

CO5- Basic understanding of ENT-CSOM, ASOM, DNS, Laryngeal tumor, and nasal polyp, as well as cataract and glaucoma.

Unit	Content	Credit Hours
1	**Craniotomy surgery:** Head injury & Intracranial bleed. PIVD, Potts spine.	20
2	**Gynecological complications and its management:** Disease of G & O: - Caesarian section, fibroid uterus, Cancer uterus, prolapse uterus, PID.	24
3	**Fracture and its management:** Basics about fracture, Management of fractures.	24
4	**Eye and ENT surgeries:** Cataract**,** Glaucoma, CSOM**,** ASOM**,** Laryngeal tumor**,** Nasal polyp**,** DNS, Oral cavity tumors.	24
5	**Paediatric surgery:** Diaphragrantic Hernia, Meningo Myelocoele& Spina bifida**,** Cystic hygroma**,** Basic of Congenital Heart d's**,** Hirschsprung d's, Ano-rectal malformation.	28

BASICS OF SURGERY PRACTICAL

Practical	Subject Code: BOTT-302P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	General surgical instruments and used	60
2	Diathermy machine	
3	Defibrillator	
4	Sterilization methods	
5	Maintenance of equipment's.	
6	Methods of cleaning instrument	

Reference Books:

1. Paul Marino -The ICU Book -4th edition
2. Berry, Edna Carnelia& Marie Louis Kohn-Introduction to OR techniques -4th ed.
3. Brigden, Raymond. J-OT Technical-5th edition
4. Dixon, Elleen-Theater Techniques-5th edition
5. Nurse Anaesthesia by Nagelhout and Plans-5th edition (2014)Elsevier
6. Clinical Anaesthesia by Pramila Bajaj-3rd edition
7. Lee's Synopsis of Anesthesia-13th edition

PAPER-III: CLINICAL IN OPERATION THEATRE TECHNOLOGY BOTT-303

Theory	Subject Code: BOTT-303
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

Here students learn about structure specialized surgeries and various types of sterile technologies.

Course Outcomes (COs)

CO1- Surgical scrubs, gowning, gloving, surgical instruments, and chemical and radiation sterilization are some examples of aspects and sterile technologies.

CO2- Learn about specialized surgical equipment, such as laser, microsurgery, and electrocautery.

CO3- Learn about patient positioning, draping, and preparation for general surgery, breast procedures, abdominal procedures, splenic procedures, and pancreatic procedures.

Unit	Content	Credit Hours
1	**Physical Facility:** Layout of Operation theatres**,** Transition**,** Peripheral Support areas, Operating room, Special procedure rooms, Potential sources of injury to the caregiver & patient.	24
2	**Principles of aspects & sterile technologies:** Sterile, surgical scrub, gowning & gloving**,** Decontamination & disinfections**,** Sterilization Assembly & packing**,** Thermal sterilization**,** Chemical sterilization**,** Radiation sterilization.	24
3	**Types of instruments in surgery:** Surgical instrumentation**,** Fabrication**,** Powered, surgical instruments**,** Handling instruments.	20
4	**Specialized surgical equipment:** Electro catheter**,** Laser**,** Microsurgery**,** Ultrasonography.	24
5	**Positioning prepping and draping the patient:** General surgery**,** Breast procedures, Abdominal surgery, Liver Procedures, Splenic procedures, Pancreatic Procedures, Esophageal.	28

CLINICAL IN OPERATION THEATRE TECHNOLOGY PRACTICAL

Practical	Subject Code: BOTT- 303P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	Layout of Operation theatre, OT lights, laminar airflow	60
2	Maintenance of Temperature, humidity and sterility	
3	Classification of surgical instruments	
4	Preparation of surgical trolley	
5	Handling and maintenance of Endoscope, laparoscope, microsurgical instruments	
6	Positioning , Part preparation, draping	

7	Various types of suture material, needles and uses.	

Reference Books:

1. Nurse Anaesthesia by Nagelhout and Plans-5th edition (2014) Elsevier
2. Drugs by Pramila Bajaj Clinical Anaesthesia
3. Lee's Synopsis of Anesthesia-13th editions
4. Short Textbook of Anaesthesia Dr Ajay Yadav- Jaypee Brother Publisher
5. Essential of Anaesthesia and Critical Care Anshul Jain- Jaypee Brother Publisher

PAPER-IV: APPLIED OPERATION THEATRE TECHNOLOGY BOTT- 304

Theory	Subject Code: BOTT-304
Total Marks for Evaluation: 100	No. of Credit hours:120, Credits: 4

Course objective

Subject deals with the operative procedure. Students learn about anaesthesia and their types.

This subject is also designed to make the students pre and post operative care of the patient.

Course Outcomes (COs)

CO1- Enhancing knowledge through a clinical posting on preoperative preparation and a lecture demonstration.

CO2- Understanding of diagnostic techniques such pathology testing, radiology testing, MRI, ultrasonography, and endoscopy.

CO3- Students should be able to choose anesthetic kinds, when to use them, as well as their indications, risks, and monitoring.

Unit	Content	Credit Hours
1	**Preoperative preparation of the patient:** Diagnostic procedures**,** Pathological examination**,** Radiological examination**,** MRI**,** Nuclear medicine studies**,** Ultrasonography**,** Endoscopy.	24
2	**Introduction and types of anesthesia:** Historical background**,** Types of Anaesthesia**,** Choice of Anaesthesia**,** General Anaesthesia.	24
3	**General and local anesthesia:** Indication of general anaesthesia**,** Endotracheal, intubation**,** Maintenance**,** Monitoring**,** Emergency**,** Balanced Anaesthesia**,** Core of Anaesthetized patient, Local & regional anaesthesia.	24

4	**Spinal and intravenous anaesthesia:** Spinal and epidural anaesthesia**,** Intravenous anaesthesia agents**,** Inhalational anaesthetic agents**,** Anaesthetic Adjuvant drugs.	24
5	**Complication:** Complication of general anaesthesia**,** Complication of local/regional anaesthesia**,** Blood transfusion, Anaesthesia Machine & central gas supply, Difficult intubation,	24

APPLIED OPERATION THEATRE TECHNOLOGY PRACTICAL

Practical	Subject Code: BOTT-304P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	PAC, drugs used in premedication, NPO protocol, ASA grading	60
2	Role of technician in Pre operative room	
3	IV and inhalation anaesthetic agents	
4	Balanced anaesthesia, Triad of Anaesthesia	
5	Preoperative checklist of Anaesthesia and drugs	
6	Anaesthesia ventilator: Settings, alarm system	

Reference Books:

1. Nurse Anaesthesia by Nagelhout and Plans-5th edition (2014) Elsevier
2. Drugs by Pramila Bajaj Clinical Anaesthesia
3. Lee's Synopsis of Anesthesia-13th edition
4. Short Textbook of Anaesthesia Dr Ajay Yadav- Jaypee Brother Publisher
5. Essential of Anaesthesia and Critical Care Anshul Jain- Jaypee Brother Publisher

PAPER-V: RECENT ADVANCES IN OPERATION THEATRE TECHNOLOGY BOTT-305

Theory	Subject Code: BOTT-305
Total Marks for Evaluation: 100	No. of Credit hours: 120, Credits: 4

Course objective

This subject is designed for providing the deep knowledge of various aspects of operation procedures. This subject deals with the topics related to advancement in the operation theatres.

Course Outcomes (COs)

CO1- Enhancing knowledge through lecture and demonstration in a clinical setting regarding anesthesia techniques, patient positioning, nursing requirements, equipment requirements, and operation room techniques for specialty surgery.

CO2- Understanding of cardiac, vascular, thyroid, and other surgical procedures as well as organ donation and transplantation.

Unit	Content	Credit Hours
1	**Preparation of OT:** Preparation**,** Nursing requirement**,** Equipment's including instruments, Sutures.	24
2	**Patient preparation:** Anaesthesia technique**,** Patient positioning & recovery.	24
3	**Gynecological and Urological surgery:** Gynecological /obstetric surgery**,** Urologic surgery.	24
4	**Cardiac and Thoracic surgery:** Thoracic surgery, Cardiac surgery**,** Vascular surgery.	24
5	**Special surgery:** Organ procurement and transplantation**,** Thyroid surgery Orthopedic surgery, Neurosurgery, Ophthalmic surgery, Plastic and reconstructive surgery, Otorhinolaryngological and head and neck surgery.	24

RECENT ADVANCES IN OPERATION THEATRE TECHNOLOGY PRACTICAL

Practical	Subject Code: BOTT-305-P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No	List of Experiments	Credit Hours
1	Shock, hypoxia, cardiac arrest – S/S, and Management	

2	Preparation, positioning for Gyne /obst surgeries	60
3	Different neurological surgeries – positioning and preparation	
4	Different orthopedic, urology, ENT, Ophthalmic surgeries	
5	Plastic and reconstructive, thoracic, cardiac surgeries Functioning of image intensifier machine, OT table, OT lights, cautery	

Reference Books:

1. Nurse Anaesthesia by Nagelhout and Plans-5th edition (2014) Elsevier
2. Drugs by Pramila Bajaj Clinical Anaesthesia
3. Lee's Synopsis of Anesthesia-13th edition
4. Short Textbook of Anaesthesia Dr Ajay Yadav- Jaypee Brother Publisher
5. Essential of Anaesthesia and Critical Care Anshul Jain- Jaypee Brother Publisher

FOURTH YEAR

PAPER-I: REGIONAL ANAESTHETIC TECHNIQUES BOTT-A- 401

Theory	Subject Code: BOTT-A-401
Total Marks for Evaluation: 100	No. of Credit Hours: 120, Credits: 4

Course Objectives

This subject is designed for providing the deep knowledge of anaesthesia. This subject deals with the topics of various anaesthetic techniques.

Course Outcomes (COs)

CO1- To learn about the concept of Regional Anesthetic techniques. Various methods of regional Anesthetic, peripheral blood nerve location, understood about ultrasound, procedure indication, lack of patient consent, skin infection at the site of insertion, neurologic examination.

CO2- They are able to work spinal anesthesia or spinal block, subarachnoid block, intradural block and intrathecal block. And also management of pain by epidural anesthesia.

CO3- They are able to know about upper and lower limb nerve blockage like supraclavicular blockage, Interscalene, Axillary, wrist, femoral nerve, sciatic nerve blockage.

CO4- They able to inject drugs for blockage and some types of vaccines and anesthetic drugs for resolve pain and other surgical procedure in the OT.

Unit	Content	Credit Hours
1	**General outlook about regional techniques:** Introduction, Techniques for nerve location-peripheral nerve stimulator, Ultrasound guided, Indication, Contraindication, Complications-local anaesthesia systemic toxicity& block specific complications.	26
2	**Spinal and epidural:** Spinal, Epidural.	20
3	**Upper limb blocks &Nerve block:** Supraclavicular, Interscalene, Axillary, Wrist block.	24
4	**Lower limb blocks:** Femoral nerve block, Sciatic nerve block, Popliteal block, ankle block.	24
5	**Drugs used in regional block:** Local anaesthetics-xylocaine, bupivacaine, ropivacaine-all preparations, Adjuvants used in regional anaesthesia-clonidine, Dexmedetomidine, Dexamethasone, Soda bicarbonate, Fentanyl.	26

REGIONAL ANAESTHETIC TECHNIQUES PRACTICAL

Practical	Subject Code: BOTT-A-401P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S No.	List of Experiments	Credit Hours
1	Position for spinal/epidural, usage of peripheral nerve stimulator and ultrasound, procedure of all the above-mentioned blocks, items included in LP set, asepsis.	60
2	Types of spinal needles.	
3	Touhy epidural needle.	
4	Items included in LP set.	
5	Epidural catheter set-contents.	
6	Peripheral nerve stimulator.	
7	Stimuplex needles.	
8	Drugs used in regional anaesthesia, adjuvants.	
9	Atropine, ephedrine, me phentermine,	
10	Lipid emulsion	

Reference books

1. Nurse Anaesthesia by Nagelhout and Plans-5th edition (2014) Elsevier
2.Drugs by Pramila Bajaj Clinical Anaesthesia
3.Lee's Synopsis of Anesthesia-13th edition
4. Berry, Edna Carnelia and Marie Louis Kohn - Introduction to OR Techniques 4th edition
5.Brigden, Raymond. I- OT technical-5th edition
6.Dixon, Elleen - Theater Techniques-5th edition

PAPER-II: POST ANESTHESIA CARE BOTT-A-402

Theory	Subject Code: BOTT-A-402
Total Marks for Evaluation: 100	No. of Credit Hours: 120, Credits: 4

Course Objectives

In this subject student learns about care of patient after applying the anaesthesia, used during the procedures in operation theatre.

Course Outcomes (COs)

CO1- To learn about the concept of Post Anesthesia Care. they able to setup to OT, monitoring the machines and calculate the ratio between staff and patients.

CO2- They able to patient admission and discharge criteria, measurement of recovery after anesthesia to a patient, patient activity, blood pressure and respiration. Management of common complication and also post operative complication, management of nausea fever and vomiting of patients in the OT.

Unit	Content	Credit Hours
1	**Setting up of PACU:** Definition of PACU, set up, Staff & patient ratio, Monitoring in PACU.	22
2	**Admission and discharge criteria:** Aldred score, Discharge criteria, Fast tracking	22
3	**Common complications and its management in PACU:** Post Operative Complication, Nausea and Vomiting, Sore throat -hoarseness of voice, Loss of voice, Airway obstruction, Desaturation, Bronchospasm, Laryngospasm, Unresponsiveness, Neurological complications**,** Coma, Seizures, CVA (stroke), Cerebral hypoxia, Pulmonary edema, Hemorrhage from the surgical site, Vascular complications, DVT, Embolism (thrombus, air, fat, amniotic), Trauma to teeth, Headache, Backache, Ocular complications -loss of vision, Hypotension, Hypertension, Bradycardia, Tachycardia, Arrhythmia, Myocardial infarction, Hypoglycemia, Hyperglycemia, Electrolyte imbalance-hyponatremia, Hypokalemia, Hyperkalemia.	28

4	**Post operative pain relief:** Management of postoperative pain- narcotic, NSAID (IM/IV) Local anaesthetics through catheters, Transdermal patches.	24
5	**Causes of mortality in PACU:** Mortality -myocardial infarction, Arrhythmias, Hypoxia, Electrolyte imbalance, Massive hemorrhage, Embolism.	24

POST ANESTHESIA CARE PRACTICAL

Practical	Subject Code: BOTT-A-402P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No.	List of Experiments	Credit Hours
1	Checking Capillary Blood Glucose, insertion of IV cannulas, working of syringe and infusion pumps, charging defibrillators, working of laryngoscopes, oropharyngeal airways	60
2	Oxygen Mask, nebulization, Ambu bag, Ondansetron, IV cannulas	
3	Diclofenac, Ketorolac, Fentanyl, Infusion pumps, Nasal prongs, Epidural catheter, Defibrillator, Laryngoscope	
4	Endotracheal tubes, Nasopharyngeal airways, Oropharyngeal airways, Glucometer, Suction catheters	
5	Glucometer, Suction catheters	

Recommended Books

1. Paul Marino -The ICU Book _4th edition
2. Carneria & Marie Louis Kohn-Introduction to OR techniques _4th
3. Brigden, Raymond.J-OT technical
4. Berry, Edna Carnelia and Marie Louis Kohn - Introduction to OR Techniques 4th edition
5. Drugs by Pramila Bajaj Clinical Anaesthesia

PAPER-III: ANAESTHESIA SPECIALITY SURGERY BOTT-A-403

Theory	Subject Code: BOTT-A-403
Total Marks for Evaluation: 100	No. of Credit Hours: 120, Credits: 4

Course Objectives

Subject covers knowledge about anaesthesia used in surgery. Students also able to understand the detailed of anaesthesia used in specialized surgery.

Course Outcomes (COs)

CO1- Knowledge about PACU and able to set up the PACU.

CO2- They able to handle the post operative complications.

CO3- To learn the different classification of anesthesia and their side effects.

Unit	Content	Credit hours
1	**Premedication:** Setting up and monitoring system, Monitbring - invasive and non-invasive, Getting ready for the case, Induction of cardiac patient, precautions to be taken, Cardiopulmonary bypass -indication and its function, I.C.U management, Chest tube management.	20
2	**Anaesthesia, its types and management**: Special investigation - CT, Angiography and MRI, Checklist, Induction of a patient, Reinforced Endotracheal tubes, Positioning in neuro surgery, Intracranial pressure -normal values, factors increasing icp and methods to reduce Intracranial pressure in the operation theatre, Air embolism, Reversal of the patient, Transferring to I.C.U. /Ward, Pediatric Anaesthesia, Cardiac Anaesthesia, ENT Surgeries, Cardiac Anaesthesia, Arrhythmias and its types, Antianhythmic drugs, Angina and its types, Dyspnea & its causes, Anaesthesia for Trauma & Hypovolemic Shock, Resuscitation - airway, Breathing Preoperative investigations& assessment, Circulatory management, Causes of unconsciousness, Rapid sequence induction, Tension pneumothorax-pathophysiology and management, Thoracic Anaesthesia, Pulmonary function tests bed side, Induction. {intubation Lung isolation- Indications, Techniques, Complications, Double lumen tubes, Monitoring during single lung ventilation, Pain management, Ektubation. Geriatric Anaesthesia, ENT Anaesthesia, Anaesthesia for adenotonsillectomy-challenges, positioning, throat packing and pack, Anaesthesia for mastoidectomy and FESS-methods to minimize bleeding, Anaesthesia for Bronchoscopy and esophagoscopy.	28
3	**Complications during orthopedic procedures and anaesthetic challenges:** Fat embolism, Massive hemorrhage, Tourniquet complications, Radiation hazard, RAE tubes, Obstetric Anaesthesia Pediatric Anaesthesia, Differences between a pregnant and a non-pregnant lady, Risks for anaesthesia difficult airway, Supine hypotension syndrome, Regional vs general anaesthesia, Induction / maintenance and recovery, Resuscitation of the new born, Apgar score, Reversal and Extubation, Emergencies - manual removal of placenta, Antepartum hemorrhage and Postpartum hemorrhage Rupture uterus, Ectopic pregnancy, Amniotic fluid embolism.	26
4	**Cath lab investigation and Urology:** Anaesthesia outside operation room, Day care surgeries, Laparoscopic and geriatric Anaesthesia, Endoscopic procedures in urology, Types of irrigation fluids glycine, and normal saline, Complications of transurethral resection of the prostate, Lithotomy position and its complications, Problems of anaesthetising patients in Endoscopy, Radiology -CT,MRI, Day care Anaesthesia, Special features, Advantages and Disadvantages.	24
5	**Surgeries:** Plastic and Reconstructive Surgery and Vascular Surgery, Complications during revascularization and its management, Recognition of compartment syndrome, Laparoscopic Surgeries and its complications, Effects of increased intragastric pressure.	22

ANAESTHESIA SPECIALITY SURGERY PRACTICAL

Practical	Subject Code: BOTT-A-403P
Total Marks for Evaluation: 50	No. of Credit Hours: 60, Credits: 2

S. No.	List of Experiments	Credit Hours
1	Setting up for cvp/ibp monitoring, Checking of double lumen tubes, Defibrillator-	

	charging and method of defibrillation, Care of ICD tube, Bed side lung function tests, Method of insertion of ICD.	60
2	Lithotomy position, Insertion of ryles tube.	
3	Preparation for anaesthesia in MRI.	
4	Tourniquet application, Position for tonsillectomy, Setting up of arterial/ CVP monitoring, Discussion on endotracheal tubes, Preparation for difficult intubation.	
5	Amiodarone, Adrenaline, Ketamine, Defibrillator, Mannitol, Methergine, Oxytocin.	
6	Magill's forceps, Flex metallic tubes, Pediatric face mask, Pediatric airway, Pediatric supraglottic airway.	

Reference Books

1. Paul Marino -The ICU Book -4th edition
2. Berry, Edna Camelia & Marie Louis Kohn-lntroduction to OR techniques -4th ed.
3. Brigden, Raymond. J-OT Technical- 5th edition
4. Dixon, Elleen-Theater Techniques-5th edition
5. Nurse Anaesthesia by Nagelhout and Plans-Sth edition (2014) Elsevier
6. Clinical Anaesthesia by Pramila