Maharaja Ranjit Singh Punjab Technical University
Bathinda-151001

FACULTY OF PHARMACY

SYLLABUS

FOR

B.SC. MEDICAL TECHNOLOGY (ANESTHESIA AND OPERATION THEATRE TECHNOLOGY)

(4 YEARS PROGRAMME)

2023 BATCH ONWARDS

SCHEME

1st Semester		Contact Hrs.			Marks			Credits
Subject Code	**Subject**	**L**	**T**	**P**	**Int.**	**Ext**	**Total**	
BAOTS1-101	Anatomy and Physiology-I	3	1	0	40	60	100	4
BAOTS1-102	Microbiology -I	3	1	0	40	60	100	4
BAOTS1-103	Pathology-1	3	1	0	40	60	100	4
BAOTS1-104	Computer Science	2	0	0	20	30	50	2
BAOTS1-105	Anatomy and Physiology -Lab	0	0	4	60	40	100	2
BAOTS1-106	Microbiology -I Lab	0	0	4	60	40	100	2
BAOTS1-107	Pathology I -Lab	0	0	4	60	40	100	2
Total		**11**	**03**	**12**	**320**	**330**	**650**	**20**

2nd Semester		Contact Hrs.			Marks			Credits
Subject Code	**Subject**	**L**	**T**	**P**	**Int.**	**Ext**	**Total**	
BAOTS1-201	Anatomy and Physiology-II	3	1	0	40	60	100	4
BAOTS1-202	Microbiology -II	3	1	0	40	60	100	4
BAOTS1-203	Pathology -II	3	1	0	40	60	100	4
BAOTS1-204	Basics and Advanced Life support	2	0	0	20	30	50	2
BAOTS1-205	Anatomy and Physiology -II Lab	0	0	4	60	40	100	2
BAOTS1-206	Pathology II - Lab	0	0	4	60	40	100	2
BAOTS1-207	Microbiology -II Lab	0	0	4	60	40	100	2
Total		**11**	**03**	**12**	**320**	**330**	**650**	**20**

3rd Semester		Contact Hrs.			Marks			Credits
Subject Code	**Subject**	**L**	**T**	**P**	**Int.**	**Ext**	**Total**	
BAOTS1-301	Anatomy & Physiology related to Anesthesia Technology	3	1	0	40	60	100	4
BAOTS1-302	Applied Pharmacology and Microbiology	3	1	0	40	60	100	4
BAOTS1-303	Medical Ethics and Bio safety	3	1	0	40	60	100	4
BAOTS1-304	Psychology	3	1	0	40	60	100	4
BAOTS1-305	Anatomy & Physiology related to Anesthesia Technology Practical	0	0	4	60	40	100	2
BAOTS1-306	Applied Pharmacology and MicrobiologyPractical	0	0	4	60	40	100	2
Total		**12**	**4**	**8**	**280**	**320**	**600**	**20**

4th Semester		Contact Hrs.			Marks			Credits
Subject Code	**Subject**	**L**	**T**	**P**	**Int.**	**Ext**	**Total**	
BAOTS1-401	Principles Of Anesthesia - I	3	1	0	40	60	100	4
BAOTS1-402	Principles Of Anesthesia - II	3	1	0	40	60	100	4
BAOTS1-403	Biochemistry-1	3	1	0	40	60	100	4
BAOTS1-404	Medical Sociology	2	0	0	20	30	50	2
BAOTS1-405	Principles Of Anesthesia - I Practical	0	0	4	60	40	100	2
BAOTS1-406	Principles Of Anesthesia -II Practical	0	0	4	60	40	100	2
BAOTS1-407	Biochemistry-1 Lab	0	0	4	60	40	100	2
Total		**11**	**03**	**12**	**320**	**330**	**650**	**20**

5th Semester		Contact Hrs.			Marks			Credits
Subject Code	**Subject**	**L**	**T**	**P**	**Int.**	**Ext**	**Total**	
BAOTS1-501	Pharmacology	3	1	0	40	60	100	4
BAOTS1-502	Anesthesia Techniques Including Complications	3	1	0	40	60	100	4
BAOTS1-503	Biochemistry-II	3	1	0	40	60	100	4
BAOTS1-504	Environmental science and community medicine	2	0	0	20	30	50	2
BAOTS1-505	Pharmacology Lab	0	0	4	60	40	100	2
BAOTS1-506	Anesthesia Techniques Including Complications-Practical	0	0	4	60	40	100	2
BAOTS1-507	Biochemistry-II Lab	0	0	4	60	40	100	2
Total		**11**	**03**	**12**	**320**	**330**	**650**	**20**

6th Semester		Contact Hrs.			Marks			Credits
Subject Code	**Subject**	**L**	**T**	**P**	**Int.**	**Ext**	**Total**	
BAOTS1-601	Anesthesia for specialties (including criticalcare assistance and ventilation) paper – I	3	1	0	40	60	100	4
BAOTS1-602	Anesthesia for specialties (including criticalcare assistance and ventilation) paper – II	3	1	0	40	60	100	4
BAOTS1-603	Principles Of Sterilization Techniques	3	1	0	40	60	100	4
BAOTS1-604	Healthcare and basic Principles	2	0	0	20	30	50	2
BAOTS1-605	Anesthesia for specialties (including critical care assistance and ventilation) paper – I Practical	0	0	4	60	40	100	2
BAOTS1-606	Anesthesia for specialties (including criticalcare assistance and ventilation) paper – II-Practical	0	0	4	60	40	100	2
BAOTS1-607	Principles Of Sterilization Techniques-Practical	0	0	4	60	40	100	2
Total		**11**	**3**	**12**	**320**	**330**	**650**	**20**

7th Semester		Contact Hrs.			Marks			Credits
Subject Code	**Subject**	**L**	**T**	**P**	**Int.**	**Ext**	**Total**	
BAOTS1-701	Project/ Dissertation	0	0	40	50	150	200	20
BAOTS1-702	Biostatistics and Research Methodology	2	0	0	20	30	50	2
Total		**2**	**0**	**40**	**70**	**180**	**250**	**22**

The candidates will supervise by the concern faculty & and the project report will be submitted following competitions. The Viva-Voce examination shall be conducted by external expert

8th Semester		Contact Hrs.			Marks			Credits
Subject Code	**Subject**	**L**	**T**	**P**	**Int.**	**Ext**	**Total**	
BAOTS1-801	Internship	0	0	40	80	120	200	20
Total		**0**	**0**	**40**	**80**	**120**	**200**	**20**

The candidate can carry out Dissertation/Major Project working-house/internally or outside/externally and shall submit a report which will be evaluated by external expert at the end of academic year.

Overall Marks / Credits

Semester	Marks	Credits
1st	650	20
2nd	650	20
3rd	600	20
4th	650	20
5th	650	20
6th	650	20
7th	250	22
8th	200	20
Total	**4300**	**162**

FIRST SEMESTER

ANATOMY AND PHYSIOLOGY-I

Subject Code: BAOTS1-101 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Course Objective

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections anddissected cadavers and preserved specimens.

Course Outcome

At the end of the course the student should be able to:

- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be "human".

UNIT I (12 Hrs)

Organization of the Human Body

Introduction to the human body
Definition and subdivisions of anatomy
Anatomical position and terminology
Regions and Systems of the body
Cavities of the body and their contents
Levels of organization of the body

Cell and Functions

Definition of a cell, shapes and sizes of cells
Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

UNIT II (12 Hrs)

Tissues and Functions

Tissues of the body
Definition and types of basic tissues
Characteristics, functions and locations of different types of tissues

General Physiology- Concept of Homeostasis**,** Cell structure and functions**,** Transport across membranes

Nerve and muscle- Nerve structure, classification of nerve fibres, Muscles- classification, structure, Neuro-Muscular junction (NMJ). Muscle contraction-mechanism, types.

Blood and body fluids- Body fluid volumes, compartments and composition**,** Blood composition and functions**,** Plasma proteins**,** Erythrocytes -Morphology and functions**,** Leucocytes-Morphology and functions**,** Platelets-Morphology and functions**,** Blood groups.

UNIT III (12 Hrs)

Systems of Support and Movement

Skeletal system- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types ofbones. Parts of bones. Functions of bones. Name location and general features of the bones of the body. Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

Muscular system- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles likesternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastronemius and diaphragm.

UNIT IV (12 Hrs)

Control Systems of the Body- Nervous system**,** Sub-divisions of the nervous system
Spinal cord – Location, extent, spinal segments, external features and internal structure.
Brain – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
Cranial nerves - Name, number, location and general distribution.
Spinal nerves - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
Autonomic Nervous system –definition and functions, Sense organs, Location and features of the nose, tongue, eye, ear and skin

UNIT V (12 Hrs)

Excretory system

Structure of Nephron and its blood supply, JuxtaglomerularApparatus (JGA).
Formation of urine-Filtration, Reabsorption and secretion. Counter -Current mechanism Micturition.
Endocrine system- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.
Digestive system- Salivary glands -Nerve supply, functions of saliva**.** Gastric juice-composition &functions of gastric juice. Pancreatic juice-composition, functions and regulation of pancreaticjuice. Bile- composition, functions of bile and bile salts. Succus entericus and small intestinal movements. Deglutition, vomiting, functions of large intestine

Reference Books

1. Rizzo DC. Fundamentals of Anatomy and Physiology (Book Only). Cengage Learning; 2009 Oct 1.
2. Waugh A, Grant A. Ross & Wilson Anatomy and physiology in health and illness E-book. Elsevier Health Sciences; 2014 Jun 25.
3. Remington LA, Goodwin D. Clinical Anatomy and Physiology of the Visual System: Clinical Anatomy and Physiology of the Visual System E-Book. Elsevier Health Sciences; 2021 Jun 25.

MICROBIOLOGY-I

Subject Code: BAOTS1-102 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Course Objective:

- Concepts of sterilization and disinfection procedures and their applications.
- Basic principles of immunology.
- Knowledge about fundamental aspect of bacteria and study the common disease caused by them.

Course Outcome: At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

UNIT-I (12 Hrs)

Introduction, history of microbiology, its branches, scope and its importance. Introduction to Prokaryotes and Eukaryotes Study of ultra-structure and morphological classification of bacteria, nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve, isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count). Study of different types of phase constrast microscopy, dark field microscopy and electron microscopy

UNIT-II (12 Hrs)

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection, Culture media, Culture methods and Identification ofbacteria.

UNIT-III (12 Hrs)

Immunology-Basic concept about Infection (Source, Portal of entry and Spread),Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.
Identification of bacteria using staining techniques (simple, Gram's & Acid fast staining) and biochemical tests (IMViC). Study of principle, procedure, merits, demerits and applications of physical, chemical gaseous, radiation and mechanical method of sterilization. Evaluation of the efficiency of sterilization methods. Equipments employed in large scale sterilization. Sterility indicators

UNIT-IV (12 Hrs)

Study of morphology, classification, reproduction/replication and cultivation of Fungi and Viruses. Classification and mode of action of disinfectants Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions Evaluation of bactericidal & Bacteriostatic. Sterility testing of products (solids, liquids, ophthalmic and other sterile products) according to IP, BP and USP.
Systemic bacteriology- Disease caused and lab diagnosis of medically importantbacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes).

UNIT-V (12 Hrs)

Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification. Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids. Assessment of a new antibiotic.

Reference Books

1. Marsh PD, Lewis MA, Williams D, Martin MV. Oral microbiology E-book. Elsevier health sciences; 2009 Apr 30.
2. Talaro KP, Talaro A, Delisle G, Tomalty L. Foundations in microbiology. Wm. C. Brown; 1996 Jan.
3. Parker N, Schneegurt M, Thi Tu AH, Foster BM, Lister P. Microbiology (OpenStax). OpenStax; 2016. Crueger W, Crueger A, Brock TD, Brock TD. Biotechnology: a textbook of industrial microbiology

PATHOLOGY-I

Subject Code: BAOTS1-103 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Course Objective:

- To understand the fundamental mechanisms underlying diseases.
- To develop skills to recognize and diagnose diseases based on clinical and laboratory findings.
- To examine tissue and organ abnormalities through histological analysis.
- To recognize the vital role of pathology in healthcare and research.

Course Outcome:

- Develop the skills needed to diagnose and differentiate diseases.
- Gain the ability to analyze and interpret microscopic and macroscopic pathology findings.
- Comprehend the cellular and molecular processes underlying diseases.
- Apply pathology concepts to inform clinical decision-making and patient care.

UNIT I (12 Hrs)

Introduction to cell- Normal Cell Structure Function Cell injury and Adaptation: Types of cell injury, Adaptation, Necrosis, Apoptosis, Pathological calcification

UNIT II (12 Hrs)

Inflammation and Repair

Acute Inflammation
Chronic Inflammation
Wound Healing and Repair

Infectious Disease

TB
Leprosy

UNIT III (12 Hrs)

Hemodynamic Disorder

Edema
Thrombosis and Embolism
Shock

UNIT IV (12 Hrs)

Neoplasia

Classification
Nomenclature
Characteristics of Benign & Malignant neoplasm
Pathogenesis of cancer
Spread of Cancer

UNIT V (12 Hrs)

Genetic Disorders

Down syndrome

Klinfelter Syndrome

Turner Syndrome

Radiation

Biological Effect of Radiation

Reference Books

1. Kumar V, Abbas A, Aster JC, editors. Robbins basic pathology e-book. Elsevier Health Sciences; 2017 Mar 8.
2. Underwood JC, Cross SS. General and Systematic Pathology E-Book. Elsevier Health Sciences; 2009 May 11.
3. King T. Elsevier's integrated pathology E-book. Elsevier Health Sciences; 2006 Dec 4.
4. Thompson LD, Bishop JA. Head and neck pathology E-book: a volume in the series: foundations in diagnostic pathology. Elsevier Health Sciences; 2017 Dec 8.

COMPUTER SCIENCE

Subject Code: BAOTS1-104 **L T P C** **Duration: 30 Hrs.**
2 0 0 2

Course Objective:

- Acquire the ability to apply computer science principles to solve pharmaceutical and healthcare-related problems.
- Analyze and interpret pharmaceutical data using computer-based methods, enhancing research and decision-making in the field.
- Gain proficiency in designing and implementing computer systems tailored to pharmaceutical and healthcare settings, improving efficiency and patient care.
- Foster collaboration between pharmacy and computer science disciplines to harness technology for optimizing pharmaceutical practices and research.

Course Outcome:

- Learn to apply computer science principles to solve pharmaceutical and healthcare-related problems.
- Learn to analyze and interpret pharmaceutical data using computer-based methods, enhancing research and decision-making in the field.
- Learn to design and implement computer systems tailored to pharmaceutical and healthcare settings, improving efficiency and patient care.

UNIT I (6 Hrs)

History of computers

Definition of computers
Input devices,
Output devices,
Storage devices,
Types of memory,
And units of measurement,
Range of computers,
Generations of computers,
Characteristics of computers

UNIT II (6 Hrs)

System

Hardware,
Software,
System definition,
Fundamentals of Networking,
Internet,
Performing searches and working with search engines,
Types of software and its applications

UNIT III (6 Hrs)

Office application suite

Word processor,
Spreadsheet,
Presentations,
Other utility tools,
Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, workingwith the shell and other standard utilities.

UNIT IV (6 Hrs)

Language

Comparison chart of conventional language,
Programming languages,
Generations of programming languages,
Compilers and interpreters,
Universal programming constructs based on SDLC,
Variable, constant, identifiers, functions, procedures, if while, do – while,
For and other Structures.

UNIT V (6 Hrs)

Programming in C language

Data types, identifiers, functions and its types, arrays, union, structures and pointers
Introduction to object oriented programming with C++: classes, objects, inheritance
Polymorphism and encapsulation. Introduction to databases, and query languages,
Introduction to Bioinformatics

Reference Books:

1. Huth M, Ryan M. Logic in Computer Science: Modelling and reasoning about systems. Cambridge university press; 2004 Aug 26.
2. Gallier JH. Logic for computer science: foundations of automatic theorem proving. Courier Dover Publications; 2015 Jun 18.
3. Kay J, Barg M, Fekete A, Greening T, Hollands O, Kingston JH, Crawford K. Problem-based learning for foundation computer science courses. Computer Science Education. 2000 Aug 1;10 (2):109-28.

ANATOMY AND PHYSIOLOGY-I LAB

Subject Code: BAOTS1-105 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

Course Objective:

- Gain practical experience in conducting physiological experiments to reinforce theoretical knowledge of body functions.
- Acquires hands-on proficiency in identifying and dissecting anatomical structures, enhancing and understanding of human anatomy.
- Observing anatomical structures and physiological processes while accurately documenting findings.

Course Outcome:

- Knowledge about conducting physiological experiments of body.
- Identifying and dissecting anatomical structures, enhancing and understanding of human anatomy.
- Enhance skills in observing anatomical structures and physiological processes while accurately documenting findings.

CONTENT

1. **Histology** – Epithelium
2. **Axial & Appendicular Skeleton** with Names & Number Of Bones
3. **Muscles**
    1. Trapezius
    2. Lattisimusdorsi
    3. Biceps
    4. Triceps
    5. Deltoid
4. **Nervous System**
    1. Cerebrum
    2. Cerebellum
    3. Brain Stem
    4. Spinal Cord
5. **Special Senses**
    1. Tongue
    2. Ear
    3. Skin
    4. Eye

Reference Books

1. Rizzo DC. Fundamentals of Anatomy and Physiology (Book Only). Cengage Learning; 2009 Oct 1.
2. Waugh A, Grant A. Ross & Wilson Anatomy and physiology in health and illness E-book. Elsevier Health Sciences; 2014 Jun 25.
3. Remington LA, Goodwin D. Clinical Anatomy and Physiology of the Visual System: Clinical Anatomy and Physiology of the Visual System E-Book. Elsevier Health Sciences; 2021 Jun 25.

MICROBIOLOGY-I LAB

Subject Code: BAOTS1-106 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

Course Objective:

- Enable student to acquire essential microbiological laboratory skills and techniques.
- Facilitate the examination and identification of various microorganisms to understand their characteristics and roles.
- Teach students how to perform diagnostic tests emphasizing their clinical and research applications.
- Instill a strong commitment to laboratory safety and ethical conduct while working with microorganisms.

Course Outcome:

- Develop proficiency in aseptic techniques, culturing, and handling microorganisms, fundamental for microbiological research and applications.
- Learn to identify and classify various microorganisms using microscopy, staining and biochemical tests, expanding knowledge of microbial diversity.
- Acquire skills in conducting diagnostic tests, such as antibiotic sensitivity assays, critical for clinical and research settings. Promote a culture for safety by adhering to proper laboratory protocols and enhance the responsible handling of potentially hazardous micro-organisms.

PRACTICALS

I. Gram staining

II. Spotters

Disposable syringe
Sterile cotton swab
Bacteriological loop
Sterile tube
McIntosh fildes Jar
Autoclave

III. Nutrient Agar plate

Mac Conkey agar plate
Mac conkey with LF
Mac conkey with NLF
Blood agar plate
L J Media
RCM
BHI broth
Antibiotics susceptibility
Gram positive Cocci in cluster
Gram negative bacilli
AFB
VDRL Slide
Microtiter plate

Reference Books

1. Marsh PD, Lewis MA, Williams D, Martin MV. Oral microbiology E-book. Elsevier health sciences; 2009 Apr 30.
2. Talaro KP, Talaro A, Delisle G, Tomalty L. Foundations in microbiology. Wm. C. Brown; 1996 Jan.
3. Parker N, Schneegurt M, Thi Tu AH, Foster BM, Lister P. Microbiology (OpenStax). OpenStax; 2016. Crueger W, Crueger A, Brock TD, Brock TD. Biotechnology: a textbook of industrial microbiology

PATHOLOGY-I LAB

Subject Code: BAOTS1-107 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

Course Objective:

- Enable students to acquire hands on skills in identifying and analyzing pathological specimens and tissues.
- Teach students to conduct laboratory tests and examination for the diagnosis and evaluation of disease.
- Improve student's ability to use microscopes for the examination of cellular and tissue level pathological changes.
- Promote a culture of safety and ethical conduct while handling pathological specimens and data in laboratory.

Course Outcome:

- Gain hands-on expertise in the examination and interpretation of pathological specimens and tissues.
- Demonstrate the ability to perform laboratory tests and investigation for disease diagnosis and monitoring.
- Improve proficiency in microscopy to identify and understand cellular and tissue level pathological changes.
- Foster a commitment to safety and ethical standards while handling and analyzing pathological specimens in the laboratory.

PRACTICALS

1. **DIFFERENTIAL COUNT**
   Spotter
2. **GROSS (SPOTTER)**
   Fatty liver
   Lipoma
   Dry gangrene foot
   Wet gangrene bowel
   CVC Spleen
   Hydatid cyst
   TB – Lung
3. **INSTRUMENTS**
   Westergrens ESR tube
   Sahlihemocytometer
   Neaubaur's chamber
   Bone Marrow Needle

Reference Books

1. Kumar V, Abbas A, Aster JC, editors. Robbins basic pathology e-book. Elsevier Health Sciences; 2017 Mar 8.
2. Underwood JC, Cross SS. General and Systematic Pathology E-Book. Elsevier Health Sciences; 2009 May 11.
3. King T. Elsevier's integrated pathology E-book. Elsevier Health Sciences; 2006 Dec 4.
4. Thompson LD, Bishop JA. Head and neck pathology E-book: a volume in the series: foundations in diagnostic pathology. Elsevier Health Sciences; 2017 Dec 8.

SECOND SEMESTER

ANATOMY AND PHYSIOLOGY-II

Subject Code: BAOTS1-201 **L T P C** **Contact Hrs.: 60 Hrs.**
3 1 0 4

Course objectives:

- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be "human".

Course outcome: At the end of the course the student should be able to:

- Understand the structure and functions of the organ systems of the human body.
- Knowledge about the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Understand self-identity of what it means to be "human".

Unit I (12 Hrs.)

Maintenance of the Human Body

Cardio-vascular system

- Types and general structure and function of blood vessels. Structure and types of arteries and veins. Structureof capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main- distribution of principal arteries and veins.

Unit II (12 Hrs.)

Lymphatic system

- Lymph, lymphatic vessels, name, location and features and functions of the lymphatic organs.

Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit- III (12 Hrs.)

Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

Unit IV (12 Hrs.)

Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

Unit V (12 Hrs.)

- **Reproductive system** Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Reference Books

1. Rizzo DC. Fundamentals of Anatomy and Physiology (Book Only). Cengage Learning; 2009 Oct 1.
2. Waugh A, Grant A. Ross & Wilson Anatomy and physiology in health and illness E-book. Elsevier Health Sciences; 2014 Jun 25.
3. Remington LA, Goodwin D. Clinical Anatomy and Physiology of the Visual System: Clinical Anatomy and Physiology of the Visual System E-Book. Elsevier Health Sciences; 2021 Jun 25.

MICROBIOLOGY-II

Subject Code: BAOTS1-202 **L T P C** **Contact Hrs.: 60 Hrs**
3 1 0 4

Course objective:

- Concepts of sterilization and disinfection procedures and their applications.
- Basic principles of immunology.
- Basic fundamental aspect of bacteria and study the common disease caused by them.

Course outcome:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them

UNIT I (12 Hrs.)

Virology: Introduction to virology, List of medically important viruses and diseases(AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

UNIT II (12 Hrs.)

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

UNIT III (12 Hrs.)

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W. bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

UNIT IV (12 Hrs.)

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

UNIT V (12 Hrs.)

Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage. Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations. Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures. Application of cell cultures in pharmaceutical industry and research.

Reference Books

1. Marsh PD, Lewis MA, Williams D, Martin MV. Oral microbiology E-book. Elsevier health sciences; 2009 Apr 30.
2. Talaro KP, Talaro A, Delisle G, Tomalty L. Foundations in microbiology. Wm. C. Brown; 1996 Jan.
3. Parker N, Schneegurt M, Thi Tu AH, Foster BM, Lister P. Microbiology (OpenStax). OpenStax; 2016. Crueger W, Crueger A, Brock TD, Brock TD. Biotechnology: a textbook of industrial microbiology

PATHOLOGY-II

Subject Code: BAOTS1-203 **L T P C** **Contact Hrs.: 60 Hrs**
3 1 0 4

Course objective:

- To understand the fundamental mechanisms underlying diseases.
- To develop skills to recognize and diagnose diseases based on clinical and laboratory findings.
- To examine tissue and organ abnormalities through histological analysis.
- To recognize the vital role of pathology in healthcare and research.

Course outcome:

- Develop the skills needed to diagnose and differentiate diseases.
- Gain the ability to analyze and interpret microscopic and macroscopic pathology findings.
- Comprehend the cellular and molecular processes underlying diseases.
- Apply pathology concepts to inform clinical decision-making and patient care.

Unit I (12 Hrs.)

- **CVS**
  - Atherosclerosis
  - Ischemic heart diease
  - Congenital heart diseae
  - Valvular heart disease
- **RESPIRATORY SYSTEM**
  - Bronchial Asthma
  - Emphysema
  - Bronchiectasis

Unit II (12 Hrs.)

- **GIT**
  - Gastric ulcer
  - Tumors of GIT
- **HEPATOBILIARY**
  - Hepatitis
  - Liver Abscess
  - Cirrhosis
  - Cholecystits

Unit III (12 Hrs.)

- **KIDNEY AND URINARY TRACT**
  - Renal stones
  - UTI and Pyelonephritis
  - Renal cell carcinoma (RCC)
  - Renal Failure

- **REPRODUCTIVE SYSTEM**
  - Diseases of testis, uterus, cervix and ovary

Unit IV (12 Hrs.)

- **CNS**
  - Infections
- **BONES and JOINTS**
  - Septic Arthritis
  - Osteomyelitis
  - Rheumatoid Arthritis

Unit V (12 Hrs.)

- ANEMIA
- AUTOIMMUNE DISEASES

Reference Books

1. Kumar V, Abbas A, Aster JC, editors. Robbins basic pathology e-book. Elsevier Health Sciences; 2017 Mar 8.
2. Underwood JC, Cross SS. General and Systematic Pathology E-Book. Elsevier Health Sciences; 2009 May 11.
3. King T. Elsevier's integrated pathology E-book. Elsevier Health Sciences; 2006 Dec 4.
4. Thompson LD, Bishop JA. Head and neck pathology E-book: a volume in the series: foundations in diagnostic pathology. Elsevier Health Sciences; 2017 Dec 8.

BASIC AND ADVANCED LIFE SUPPORT

Subject Code: **BAOTS1-204** **L T P C** **30 Hours**
2 0 0 2

Course Objectives:

- Expected to have basic knowledge on basic medical sciences
- To develop in depth knowledge on concepts of pathological conditions.
- To develop exhaustive ideology of techniques in regional and general anesthesia

Course Outcome:

- Gain knowledge on history of anesthesia, pre and post - operative assessment.
- Learn the investigations and pre-anesthetic orders required for patient to be anesthetized.
- Gain knowledge on the management of complications and anesthetic considerations.

UNIT-I (6 Hours)

- BLS
- TRIAGE
- Primary Survey
- Secondary Survey
- Airway & Ventilatory management
- Shock
- Central & peripheral venous access
- Thoracic trauma – Tension pneumothorax
- Other thoracic injuries
- Abdominal trauma – Blunt injuries

UNIT-II (6 Hours)

- Abdominal trauma – Penetrating injuries
- Spine and spinal cord trauma
- Head trauma
- Musculoskeletal trauma
- Electrical injuries
- Thermal burns
- Cold injury
- Pediatric trauma
- Trauma in pregnant women
- Workshop BLS

UNIT-III (6 Hours)

- Workshop cervical spine immobilization
- Imaging studies in trauma
- The universal algorithm for adult ECC
- Ventricular fibrillation/Pulseless ventricular tachycardia algorithm
- Pulseless electrical activity (PEA) / asystole algorithm

UNIT-VI (6 Hours)

- Bradycardia treatment algorithm
- Tachycardia Treatment algorithm
- Hypotension / Shock
- Acute myocardial infarction
- Pediatrics Advanced life support

UNIT-V (6 Hours)

- Defibrillation
- Drugs used in ACLS
- Emergency cardiac pacing
- AED
- Techniques for oxygenation and ventilation

Reference books

1. Ferguson, J. "Advanced paediatric life support, 3rd edn: Advanced Life Support Group.(£ 25). BMJ Books, 2001. ISBN 0-7279-1554-1." (2002): 186-186.
2. Samuels, Martin, and Sue Wieteska, eds. *Advanced paediatric life support: a practical approach to emergencies*. John Wiley & Sons, 2016.

ANATOMY AND PHYSIOLOGY-II LAB

Subject Code: BAOTS1-205 **L T P C** **Contact Hrs.: 60 Hours**
0 0 4 2

Course objectives:

- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be "human".

Course outcome: At the end of the course the student should be able to:

- Understand the structure and functions of the organ systems of the human body.
- Knowledge about the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Understand self-identity of what it means to be "human".

PRACTICALS

- **Endocrine System**
  - Pituitary gland
  - Pineal body
  - Thyroid & parathyroid gland
  - Adrenal
  - Pancreas
  - Gonads – Ovary & Testis
- **Cardio-Vascular System**
  - Heart
- **Lymphatic system**
  - Spleen
  - Respiratory System
  - Lungs
  - Larynx
  - Trachea
- **Digestive System**
  - Salivary glands
  - Esophagus
  - Pharynx
  - Stomach
  - Liver, Gall bladder
  - Duodenum
  - Small intestine
  - Large intestine
- **Urinary system**
  - Kidneys
  - Ureter
  - Urinary bladder

- **Reproductive System**
  - Saggital section – Male & Female pelvis
  - Uterus & ligaments
  - Ovary
  - Prostate
  - Seminal vesicals
  - Vas deferens
  - Testis

Reference Books

1. Rizzo DC. Fundamentals of Anatomy and Physiology (Book Only). Cengage Learning; 2009 Oct 1.
2. Waugh A, Grant A. Ross & Wilson Anatomy and physiology in health and illness E-book. Elsevier Health Sciences; 2014 Jun 25.
3. Remington LA, Goodwin D. Clinical Anatomy and Physiology of the Visual System: Clinical Anatomy and Physiology of the Visual System E-Book. Elsevier Health Sciences; 2021 Jun 25.

MICROBIOLOGY-II LAB

Subject Code: BAOTS1-207 **L T P C** **Contact Hrs:. 60 Hours**
0 0 4 2

Course Objective:

- Concepts of sterilization and disinfection procedures and their applications.
- Basic principles of immunology.
- Basic fundamental aspect of bacteria and study the common disease caused by them.

Course outcome:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them

PRACTICALS

I. SPOTTERS

1. Ascarislumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

Reference Books

1. Marsh PD, Lewis MA, Williams D, Martin MV. Oral microbiology E-book. Elsevier health sciences; 2009 Apr 30.

2. Talaro KP, Talaro A, Delisle G, Tomalty L. Foundations in microbiology. Wm. C. Brown; 1996 Jan.
3. Parker N, Schneegurt M, Thi Tu AH, Foster BM, Lister P. Microbiology (OpenStax). OpenStax; 2016. Crueger W, Crueger A, Brock TD, Brock TD. Biotechnology: a textbook of industrial microbiology

PATHOLOGY-II LAB

Subject Code: BAOTS1-206 **L T P C** **Contact Hrs:. 60 Hours**
0 0 4 2

Course objective:

- To understand the fundamental mechanisms underlying diseases.
- To develop skills to recognize and diagnose diseases based on clinical and laboratory findings.
- To examine tissue and organ abnormalities through histological analysis.
- To recognize the vital role of pathology in healthcare and research.

Course outcome:

- Develop the skills needed to diagnose and differentiate diseases.
- Gain the ability to analyze and interpret microscopic and macroscopic pathology findings.
- Comprehend the cellular and molecular processes underlying diseases.
- Apply pathology concepts to inform clinical decision-making and patient care.

PRACTICALS

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver absces

Reference Books

1. Kumar V, Abbas A, Aster JC, editors. Robbins basic pathology e-book. Elsevier Health Sciences; 2017 Mar 8.
2. Underwood JC, Cross SS. General and Systematic Pathology E-Book. Elsevier Health Sciences; 2009 May 11.
3. King T. Elsevier's integrated pathology E-book. Elsevier Health Sciences; 2006 Dec
4. Thompson LD, Bishop JA. Head and neck pathology E-book: a volume in the series: foundations in diagnostic pathology. Elsevier Health Sciences; 2017 Dec 8.