16BM101 FUNDAMENTALS OF ANATOMY AND PHYSIOLOGY

Hours Per Week :

L	T	P	C
3	1	2	5

Total Hours :

L	T	P
45	15	30

WA/RA	SSH/HSH	CS	SA	S	BS
20	48	6	12	3	2

Course Description and Objectives:

This course provides a comprehensive study of the anatomy and physiology of the human body. Topics include in this course are body organization; respiratory, skeletal, circular, urinary, nervous systems and special senses systems. To know basic structural and functional elements of human body, to learn about organs and structures involving in system formation and functions, to understand all systems in the human body.

Course Outcomes:

The student will be able to :

- sketch engineering objects in the freehand mode.
- describe basic structural and functional elements of human body.
- explain organs and structures involving in system formation and functions.
- identify all systems in the human body.

SKILLS:

- ü *Location of body parts and identification.*
- ü *Know the various tissues and their appearances.*
- ü *Know the physics behind respiratory systems.*
- ü *Circulatory system's working principle.*

UNIT I **L-8**

BASIC ELEMENTS OF HUMAN BODY: Cell, Structure and organelles, Functions of each component in the cell; Cell membrane, Transport across membrane, Origin of cell membrane potential, Action potential, Tissue - Types, Specialized tissues, Functions.

UNIT II **L-9**

MUSCULO-SKELETALSYSTEM: Skeletal system, Anatomy of bone, Bone types and functions; Joint - Types of Joints–Sinovial joints, Types of movements Cartilage and functions; Muscular system-Types of muscles and their locations, Structure of skeletal muscle, Physiology of muscle contraction, NMJ, Introduction to EMG, Types of muscles in limbs, Locations and their actions.

UNIT III **L-11**

CIRCULATORY SYSTEM: Blood composition, Functions of blood and components Blood groups, Importance of blood groups, Identification of blood groups; Structure of heart – Properties of Cardiac muscle, Conducting system of heart, Cardiac cycle, ECG, Heart sound, Volume and pressure changes and regulation of heart rate, circulatory system; Factors regulating Blood flow. Respiratory System-Components of respiratory system, Respiratory Mechanism, Types of respiration, Oxygen and carbon dioxide transport and acid base regulation, Respiratory volumes.

UNIT IV **L-8**

URINARY AND REPRODUCTIVE SYSTEM: Urinary System-Structure of Kidney and Nephron; Mechanism of Urine formation and acid base regulation, Urinary reflex, Homeostasis and blood pressure regulation by urinary system; Reproductive system-Parts of Male reproductive system, Spermatogenesis and hormonal regulation; Parts of female reproductive system, Oogenesis and hormonal regulation, Menstrual cycle.

UNIT V **L-8**

NERVOUS SYSTEM: Structure of a Neuron, Types of Neuron, Synapses and types, Conduction of action potential in neuron; Central nervous system – Anatomy of brain, Spinal cord, Regions of brain, Brain waves, Neurotransmitters, P.N.S- Spinal reflex, Reflex action, NMJ, A. N. S- Sympathetic and Parasympathetic systems, Special senses.

ACTIVITIES:

- *Dissection of human body.dissect human body.*
- *Identify different organs human body.*
- *Measure lung capacitance using spirometer.*
- *Determine bp under various physical positions.*
- *Visit hospitals to see different physiological parameters and procedures.*