

**Learning Outcomes:**

The educational objectives of the course are to educate students to attain the following:

- Develop the understanding of the human anatomy and physiology to the biomedical students who do not have the background in biology.
- Students will understand the basics of system level organization of human body.
- The course contents will enable the students for the investigative study of anatomical structures and their functions required for Biomedical Engineers.
- The contents will allow the students to fill the gap of knowledge to relate the Human Anatomy and Physiology with Engineering.

**SYLLABUS**

Unit No.	Topics	Lectures (Hours)
	<b>Introduction to the overview and importance of the course.</b>	
1	<b>INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY:</b> Definition of anatomy and physiology, Terms related to anatomy and physiology, Anatomical planes and positions, Organs and systems. Structural Organization, Cavities of the body, homeostasis, Acid-Base balance.	6
2	<b>BODY FLUIDS/HEMATOLOGY:</b> Extracellular and intracellular fluids, Significance and Composition of body fluids; <b>Blood:</b> Composition of blood, properties and function of blood, Cellular contents of blood, their properties and functions, blood groups, coagulation of blood/hemostasis, blood transfusion, Hemoglobin and its estimation, cell counting and ESR, Disorders of red blood cells, white blood cells and platelets, Disorder of coagulation.	7
3	<b>CARDIOVASCULAR SYSTEM:</b> Anatomy of the heart and the blood vessels. Heart-position and function. Physiology and properties of Cardiac muscle – Cardiac muscle and pacemaker potential. Origin of the heart beat and electrical activity of the heart. Arteries, capillaries and veins- structure and function. Cardiac cycle. Cardiac and peripheral circulation. Blood pressure, heart rate and their regulation. Cardiac output, Pulse, Heart sound. Blood flow and its regulation. Circulatory shock and its treatment, Various circulations, Investigations in cardiology, ECG. Cardiac disorders.	10
4	<b>RESPIRATORY SYSTEM:</b> Structure and function of various parts of respiratory system, mechanism of respiration, regulation of respiration, acid-base regulation, principle of gas exchange/transport between the lungs and tissues, pulmonary volumes and capacities, pulmonary function test, Respiratory adjustments in health and	9

diseases, artificial respiration, hypoxia, abnormal type of breathing, respiratory disorders.

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| <b>5</b> | <b>LYMPHATIC SYSTEM:</b><br>Lymphatic system, lymph, lymph node, spleen disorder of lymphatic system, edema.                  | <b>5</b> |
| <b>6</b> | <b>BODY DEFENSE AND IMMUNITY:</b><br>Nonspecific and specific defense mechanism, reticulo-endothelial system, disorders.      | <b>6</b> |
| <b>7</b> | <b>INTEGUMENTARY SYSTEM:</b><br>Structure and function of skin, regulation of body temperature, skin disorder, wound healing. | <b>6</b> |

**Term Work and Practical shall be based on the above syllabus.**

**Text Books:**

1. Anatomy and Physiology in Health and Illness By: Ross and Wilson
2. Text book of Medical Physiology By: Guyton and Hall

**Reference Books:**

1. Human Anatomy and Physiology By: Dr. Padma Sanghani
2. Human Physiology and Anatomy By: Fox Staurt Ira
3. Human Anatomy (Volume 1,2,3) By: B.D.Chaurasia