

INSTITUTE	FACULTY OF PHARMACY
PROGRAM	BACHELOR OF PHARMACY
SEMESTER	1
COURSE TITLE	HUMAN ANATOMY, PHYSIOLOGY AND PATHOPHYSIOLOGY I
COURSE CODE	13PH0104T
COURSE CREDITS	4

Objective:

- 1 Understand the structural organization of the human body from cells to systems.
- 2 Comprehend physiological functions of various body systems and the principles of homeostasis.
- 3 Learn the cellular basis of disease, including injury, adaptation, and inflammation.
- 4 Recognize common pathological conditions related to skin, bones, joints, blood, cardiovascular system, and special senses.
- 5 Establish the groundwork for clinical interpretation of symptoms and disease mechanisms relevant to pharmacy and therapeutics.

Course Outcomes: After completion of this course, student will be able to:

- 1 Explain the fundamental concepts of Human Anatomy, Physiology, and Pathophysiology.
- 2 Explain the gross morphology, structure, and functions of various organs of the human body.
- 3 Understand the etiology and pathogenesis of diseases/disorders associated with the integumentary system, peripheral nervous system, and cardiovascular system.
- 4 Understand the basic mechanism behind inflammation.
- 5 Identify and differentiate the various tissues and organs of the different systems of the human body.

Pre-requisite of course: 1. Basic knowledge of Biology at higher secondary level, 2. Introductory knowledge of human body systems, 3. Familiarity with common medical and scientific terminology, 4. Ability to understand diagrams, charts, and anatomical illustrations, 5. Basic computer and internet skills for digital learning resources.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	60	20	20	0	0

Contents : Unit	Topics	Contact Hours
1	<p>Introduction to human body Cellular and tissue level of organization. Definition and scope of anatomy, physiology, and pathophysiology. Levels of structural organization and body systems, basic life processes, homeostasis, and basic anatomical terminologies. Structure and functions of the cell, transport across the cell membrane, cell division, and cell junctions. General principles of cell communication, forms of intracellular signalling- a) Contact-dependent, b) Paracrine, c) Synaptic, d) Endocrine. Classification of tissues, structure, location, and functions of epithelial, muscular, nervous, and connective tissues. , Basic principles of cell injury and adaptation. Components and types of feedback systems, causes of cellular injury, pathogenesis (cell membrane damage, mitochondrial damage, ribosome damage, and nuclear damage), morphology of cell injury – adaptive changes (atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia), cell swelling, intracellular accumulation, and cell death. Definitions of commonly used relevant medical terminologies.</p>	12
2	<p>Integumentary system and wound healing Structure and functions of skin. Skin disorders: Psoriasis, dermatitis, and pathophysiology of Leprosy. Basic principles of wound healing., Skeletal system and joints: Divisions of the skeletal system, types of bones, salient features, and functions of bones of the axial and appendicular skeletal system. Organization of skeletal muscle, physiology of muscle contraction, and neuromuscular junction. Structural and functional classification of joints. , Diseases of bones and joints: Pathophysiology of rheumatoid arthritis, osteoporosis, and gout.</p>	12
3	<p>Body fluids, blood and lymphatic system Body fluids, composition and functions of blood, hemopoiesis, formation of haemoglobin, mechanisms of coagulation, blood grouping, Rh factors, and transfusion. Lymphatic organs and tissues, lymphatic vessels, lymph formation, circulation, and functions of the lymphatic system., Basic mechanism of inflammation and repair: Introduction, classification, and pathophysiology of inflammation, mediators of inflammation., Haematological diseases: Pathophysiology of iron deficiency, megaloblastic anaemia (Vit B12 and folic acid), sickle cell anaemia, Thalassaemia, hereditary acquired anaemia, and haemophilia.</p>	12
4	<p>Peripheral nervous system Classification of the peripheral nervous system: structure and functions of the sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves., Special senses: Structure and functions of eye, ear, nose and tongue. Pathophysiology of special sense disorders- glaucoma, cataract, myopia, otitis externa, otitis media, vertigo and anosmia.</p>	12

Contents : Unit	Topics	Contact Hours
5	Cardiovascular system Anatomy of the heart, blood circulation, blood vessels, structure and functions of artery, vein, and capillaries, elements of the conduction system of the heart and heartbeat, its regulation by the autonomic nervous system, cardiac output, cardiac cycle. Regulation of blood pressure, pulse, and electrocardiogram., Pathophysiology of hypertension, cardiac arrhythmias, congestive heart failure, ischemic heart disease (angina, myocardial infarction, atherosclerosis, and coronary artery disease).	12
Total Hours		60

Textbook :

- 1 Essentials of Medical Physiology, K. Sembulingam, P. Sembulingam, Jaypee Brothers Medical Publishers, 2023
- 2 Textbook of Medical Physiology, A.C. Guyton, J.E. Hall, Elsevier, 2021
- 3 Principles of Anatomy and Physiology, G.J. Tortora, B.H. Derrickson, Wiley, 2022
- 4 Ross & Wilson Anatomy and Physiology in Health and Illness, A. Waugh, A. Grant, Elsevier, 2022
- 5 Human Anatomy and Physiology, Elaine N. Marieb, Katja Hoehn, Pearson, 2019
- 6 Essentials of Human Anatomy and Physiology, Elaine N. Marieb, Pearson, 2020

References:

- 1 Robbins Basic Pathology, Robbins Basic Pathology, Kumar, Abbas, Aster, Elsevier, 2023
- 2 Ganong's Review of Medical Physiology, Ganong's Review of Medical Physiology, Kim E. Barrett et al., McGraw-Hill, 2021
- 3 Gray's Anatomy for Students, Gray's Anatomy for Students, Drake, Vogl, Mitchell, Elsevier, 2024
- 4 Clinical Anatomy by Regions, Clinical Anatomy by Regions, Richard S. Snell, Wolters Kluwer, 2019
- 5 Netter's Atlas of Human Anatomy, Netter's Atlas of Human Anatomy, Frank H. Netter, Elsevier, 2022
- 6 Harper's Illustrated Biochemistry, Harper's Illustrated Biochemistry, Rodwell et al., McGraw-Hill, 2022
- 7 Pathophysiology: Concepts of Altered Health States, Pathophysiology: Concepts of Altered Health States, Porth, Wolters Kluwer, 2022

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery

Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
28.00	34.00	14.00	14.00	7.00	3.00

Instructional Method:

- 1 Demonstration using anatomical models
- 2 Histology slide demonstration
- 3 Case-based learning for diseases/disorders
- 4 Problem-based learning
- 5 Audio-visual learning modules
- 6 Group discussion
- 7 Quiz-based revision sessions

Supplementary Resources:

- 1 National Library of Medicine: <https://www.nlm.nih.gov>
- 2 MedlinePlus Anatomy Resources: <https://medlineplus.gov>
- 3 NIH Human Body Resources: <https://www.nih.gov>
- 4 World Health Organization: <https://www.who.int>