COURSE HANDOUT

HUMAN ANATOMY AND PHYSIOLOGY-I (THEORY)

COURSE CODE: BP101T

VISION

To be centre of excellence of international repute in pharmaceutical education and research.

MISSION

To impart pharmaceutical education through research, innovative teaching methods and practical training to produce skilled, productive and socially responsible professionals.

PROGRAMME EDUCATIONAL OBJECTIVES

- Educating pharmacy students through innovative, practical oriented teaching methods to facilitate their overall professional development.
- Promoting students and faculty members for conducting basic and applied research and scholarly activities.
- Foster an entrepreneurial spirit amalgamated with team work, leadership qualities and multidisciplinary approach.
- Contributing to society through healthcare awareness programs.
- To inculcate in students professional and ethical attitude, effective communication skill and awareness to current trends by engaging in lifelong learning to enhance skills within and across disciplines to compete globally.

Programme Name	Bachelor of Pharmacy (B. Pharmacy)
Course Name	Human Anatomy and Physiology-I (Theory)
Course Code	BP101T
Session	2023-24
Semester	I
Lecture/Tutorial (Per Week)	3 (3-1-0)
Course Credit	4
Course Coordinator Name	Mr. Abhishek

1. Scope of the Course:

This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. This subject provides the basic knowledge required to understand the various disciplines of pharmacy.

2. Course Outcomes (COs):

101.1. Understand the structural organization and basic life processes of the human body, including the levels of organization and the concept of homeostasis.
101.2. Demonstrate knowledge of cellular biology, including the structure and functions of cells, transport across cell membranes, cell division, and intracellular signaling pathways also able to Identify and describe the different types of tissues in the human body
101.3. Identify and recall the each bone of axial and appendicular skeleton with the type of joint present between them and also differentiate between various sensory organs.
101.4. Enumerate the structure of nervous system such as neuron, neuroglia and their physiology. Distinguish between central nervous system and peripheral nervous system.
101.5. Justify the types of hormones, their origin of secretion with their physiological actions and disorders.

3. Text Books:

- TB1: Sembulingam K, Sembulingam P. Essentials of Medical Physiology. Jaypee Brothers Medical Publishers, New Delhi.
- TB2: Waugh A, Grant A. Rose and Wilson Anatomy and Physiology in Health and Illness. Churchill Livingstone, Elsevier.
- TB3: Chaurasia BD. Human Anatomy, Regional and Applied Dissection and Clinical Lower Limb Abdomen and Pelvis. CBS Publishers & Distributors, New Delhi.
- TB4: Ashalatha PR, Deepa G. Textbook of Anatomy and Physiology for Nurses. Jaypee Brothers Medical Publishers, New Delhi.
- TB5: Seshayyan S. Inderbir Singh's Textbook of Anatomy. Jaypee Brothers Medical Publishers, New Delhi.

4. Reference Books:

- RB1: Hall JE, Hall ME. Textbook of Medical Physiology. Elsevier, Philadelphia.
- RB2: Darke RL, Vogl AW, Mitchell AWM. Gray's Anatomy for Students. Elsevier, Philadelphia.
- RB3: Chaudhuri SK. Concise Medical Physiology. New Central Book Agency (NCBA), London.
- RB4: Tortora GJ, Derrickson B. Principles of Anatomy and Physiology. John Wiley and Sons.
- RB5: Vander AJ, Sherman JH, Luciano DS. Vander's Human Physiology: The Mechanisms of Body Function. McGraw-Hill.

5. Other Readings & Relevant Websites:

Sr. No.	Link of Journals, Magazines, Websites and Research Papers
1	https://www.slideshare.net/AbhiDabra/presentations/
2	https://pubmed.ncbi.nlm.nih.gov/
3	http://www.biodigital.com/

6. Course Plan:

Subject: Human Anatomy and Physiology-I (Theory)	**Subject Code:** BP101T

Sr. No.	Topics	No. of Lectures
1	**Introduction to human body:** Definition and scope of anatomy and physiology, levels of structural organization and body systems, basic life processes, homeostasis, basic anatomical terminology. **Cellular level of organization:** Structure and functions of cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, intracellular signaling pathway activation by extracellular signal molecule, Forms of intracellular signaling: a) Contact-dependent b) Paracrine c) Synaptic d) Endocrine **Tissue level of organization:** Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.	10
2	**Integumentary system:** Structure and functions of skin **Skeletal system:** Divisions of skeletal system, types of bone, salient features and functions of bones of axial and appendicular skeletal system. Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction **Joints:** Structural and functional classification, Type of joint movement and its articulation	10
ST-I (Syllabus Covered from Lecture 01 to 27)		
3	**Nervous system:** Organization of nervous system, neuron, neuroglia, classification and properties of nerve fibre, electrophysiology, action potential, nerve, impulses, receptor, synapse, neurotransmitter **Central nervous system:** Meninges, ventricle of brain and cerebrospinal fluid. Structure and function of brain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, function of afferent and efferent nerve tracts, reflex activity).	10
4	**Peripheral nervous system:** Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves. **Special senses:** Structure and functions of eye, ear, nose and tongue and their disorders.	08
5	**Endocrine system:** Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus and their disorders.	07
ST- II (Syllabus Covered from Lecture 28 to 46)		

7. Lecture Plan:

Lecture No.	Topics	Dates (tentative)		CO
		Section A	Section B	
01	Introduction to human body: Definition and scope of anatomy and physiology, basic anatomical terminology	12.09.2023	11.09.2023	101.1
02	levels of structural organization and body systems, basic life processes, homeostasis	13.09.2023	15.09.2023	101.1
03	Cellular level of organization: Structure and functions of cell	14.09.2023	18.09.2023	101.2
04	Transport across cell membrane	19.09.2023	21.09.2023	101.2
05	Cell junctions, Forms of intracellular signaling: a) Contact-dependent b) Paracrine c) Synaptic d) Endocrine	20.09.2023	22.09.2023	101.2
06	Cell division	21.09.2023	25.09.2023	101.2
07	General principles of cell communication, intracellular signaling pathway activation by extracellular signal molecule.	26 Sept 2023	28.09.2023	101.2
08	Tissue level of organization: Classification of tissues, structure, location and functions of epithelial tissue.	27.09.2023	29.09.2023	101.2
09	Structure, location and functions of connective tissue.	28.09.2023	05.10.2023	101.2
10	Structure, location and functions of connective tissue contd.	03.10.2023	06.10.2023	101.2

11	Structure, location and functions of muscular and nervous tissue.	04.10.2023	09.10.2023	101.2
12	Structure, location and functions of muscular and nervous tissue contd.	05.10.2023	12.10.2023	101.2
13	Integumentary system: Structure of skin	10.10.2023	13.10.2023	101.3
14	Structure of skin contd.	11.10.2023	16.10.2023	101.3
15	Functions of skin	12.10.2023	19.10.2023	101.3
16	Skeletal System: Divisions of skeletal system, types of bone, salient features and functions of bones of axial skeletal system	17.10.2023	20.10.2023	101.3
17	Salient features and functions of bones of appendicular skeletal system	18.10.2023	23.10.2023	101.3
18	Organization of skeletal muscle	19.10.2023	26.10.2023	101.3
19	Physiology of muscle contraction, neuromuscular junction	25.10.2023	27.10.2023	101.3
20	Joints: Structural and functional classification	26.10.2023	30.10.2023	101.3
21	Type of joint movement and its articulation	31.10.2023	02.11.2023	101.3
22	Nervous system: Organization of nervous system, neuron, neuroglia	02.11.2023	03.11.2023	101.4
23	Classification and properties of nerve fibre	07.11.2023	06.11.2023	101.4
24	Electrophysiology, action potential, nerve, impulses, receptor, synapse, neurotransmitter	08.11.2023	09.11.2023	101.4
25	Central nervous system: Meninges	09.11.2023	10.11.2023	101.4
26	Ventricle of brain and cerebrospinal fluid	15.11.2023	16.11.2023	101.4
27	Structure and function of brain (cerebrum, brain stem, cerebellum)	16.11.2023	17.11.2023	101.4
28	Structure and function of brain (cerebrum, brain stem, cerebellum) contd.	28.11.2023	30.11.2023	101.4
29	Spinal cord (gross structure, function of afferent and efferent nerve tracts, reflex activity)	29.11.2023	01.12.2023	101.4
30	Spinal cord (gross structure, function of afferent and efferent nerve tracts, reflex activity) contd.	30.11.2023	04.12.2023	101.4
31	Peripheral nervous system: Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system.	05.12.2023	07.12.2023	101.4
32	Origin and functions of spinal nerves	06.12.2023	08.12.2023	101.4
33	Origin and functions of spinal nerves contd.	07.12.2023	11.12.2023	101.4
34	Origin and functions of cranial nerves	12.12.2023	14.12.2023	101.4
35	Origin and functions of cranial nerves contd.	13.12.2023	15.12.2023	101.4
36	Special senses: Structure and functions of eye and their disorders	14.12.2023	18.12.2023	101.4
37	Structure and functions of ear and their disorders	19.12.2023	21.12.2023	101.3
38	Structure and functions of nose, tongue and their disorders	20.12.2023	22.12.2023	101.3
39	Endocrine system: Classification of hormones, mechanism of hormone action	21.12.2023	25.12.2023	101.3
40	Structure and functions of pituitary gland with disorders	26.12.2023	28.12.2023	101.5
41	Structure and functions of thyroid gland, parathyroid gland with their disorders	27.12.2023	29.12.2023	101.5
42	Structure and functions of adrenal glands with disorder	28.12.2023	04.01.2024	101.5
43	Structure and functions of pancreas with disorders	02.01.2024	07.01.2024	101.5
44	Structure and functions of pineal gland with disorders	03.01.2024	08.01.2024	101.5
45	Structure and functions of thymus gland with disorders	04.01.2024	11.01.2024	101.5

8. Assignments Plan:

Sr. No.	Type of Assignment	Assignment	Marks	CO	PO (Annexure I)	Tentative Date
1	Subjective with brain storming	Describe homeostasis with few examples of Positive and negative feedback mechanism	10	101.1	PO1, PO4, PO6, PO9, PO11	18.09.2023

2	Diagram based assignment	Draw neat, clean and labeled diagram of all cellular organelles and tissues.	10	101.2	PO1, PO2, PO4, PO6, PO9, PO11	16.10.2023
3	Preparation of list	Prepare a list of bone falls under axial and appendicular skeleton and make their count 206.	10	101.3	PO1, PO4, PO6, PO11	04.11.2023
4	MCQ based with reasoning	50 Multiple choice questions based assignment from central nervous system and peripheral nervous system.	10	101.4	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO11	25.12.2023
5	Open book assignment	Preparation of a table on endocrine glands with content " Name of gland, Secreted hormone, Function of hormone, complication due to low and high level, treatment approaches	10	101.5	PO1, PO4, PO6, PO11	15.01.2024

9. Class Tests Schedule:

Sr. No.	Test Type	Topics	Marks	CO	PO (Annexure I)	Tentative Date
1	Subjective	Introduction to human body	10	101.1	PO1, PO4, PO6, PO9, PO11	16.09.2023
2	Subjective	Cellular and tissue level of organization	10	101.2	PO1, PO2, PO4, PO6, PO9, PO11	14.10.2023
3	Subjective	Skeletal system and joints; Sensory organs (Skin, Eye, Ear, Tongue and Nose)	10	101.3	PO1, PO4, PO6, PO11	04.11.2023
4	Subjective	Nervous System (Central nervous system and Peripheral nervous system)	10	101.4	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO11	23.12.2023
5	Subjective	Endocrine glands	10	101.5	PO1, PO4, PO6, PO11	15.01.2024

10. Content Beyond Syllabus (CBS):

Sr. No.	Topics	PO to be Achieved (Annexure I)
1	Prohibition of animal use for UG students and detailing of ethical issues about the use of animals for experimentation	PO7
2	Health issues due to pollution in the nearby areas (survey)	PO10

11. Proposed Activity:

Sr. No.	Type of Activity	Topics	Tentative Date
1	Guest lecture	Prohibition of animal use for UG students and detailing of ethical issues about the use of animals for experimentation	02.12.2023
2	Hands-on training	First Aid Training by the coordinator teacher (Mr Deepak Singla)	05.01.2024

12.Evaluation Scheme:

The marks allocated for continuous mode of internal assessment shall be awarded for attendance, academic activities and student-teacher interaction. Two sessional exams shall be conducted during mid of the semester. The average marks of two sessional exams shall be computed for internal assessment. Sessional

exam shall be conducted for 30 marks and shall be computed for 15 marks. Weightage for various evaluation components is as below:

Sr. No.	Evaluation Component	Weightage
1	Internal Assessment 1. Continuous Mode 2. Sessional Exams	 10 15
2	End Semester Exam	75
	Total	**100**

As per PCI and University guidelines minimum 75% attendance is required to become eligible for appearing in the End Semester Examination.

This document is approved by:

Designation	Name
Course Coordinator	Mr. Abhishek
HOD	Dr. Ajmer Singh
Principal	Dr. Kumar Guarve

ANNEXURE I: PROGRAM OUTCOMES

1. **Pharmacy knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
2. **Planning abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
4. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
5. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
6. **Professional identity:** Understand, analyze and communicate the value of their professional roles in society (e.g., health care professionals, promoters of health, educators, managers, employers, employees).
7. **Pharmaceutical ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
8. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
9. **The pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
10. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.