COURSE HANDOUT

HUMAN ANATOMY AND PHYSIOLOGY-II (THEORY)

COURSE CODE: BP201T

VISION

Train the minds to think logically and become a success

MISSION

To Develop inventive, pioneering research & high-quality technical education

PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1: To produce graduates with sound theoretical knowledge and technical skills required for career opportunities in various domains.

PEO 2: To incite the students towards research and to address the challenges with their innovative Contributions for the benefit of mankind.

PEO 3: To bring forth a quality professional equipped with technological advances to adapt easily to changes in the ever-evolving pharma and allied industry, hospital and clinical pharmacy setup, pharma retailing and distribution, and governmental and health agencies.

PEO 4: To engage graduates in professional ethical practices in a multidisciplinary environment, while contributing to organization through leadership and building team spirit.

PEO 5: Pharmacists can become lifelong learners, absorb new technologies, and then offer leadership roles in society.

Programme Name	Bachelor of Pharmacy (B. Pharmacy)
Course Name	Human Anatomy and Physiology-II (Theory)
Course Code	BP201T
Session	2023-24
Semester	II
Lecture/Tutorial (Per Week)	3 (3-1-0)
Course Credit	4
Course Coordinator Name	

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. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

2. **Course Outcomes (COs):**

201.1 Understand the composition and function of body fluids and blood, its significance and disorders and lymph circulation and functions of lymphatic system.

201.2 Comprehend the structure and functions of the cardiovascular system, including the anatomy of the heart, blood circulation, blood vessels, conduction system, cardiac output, regulation of blood pressure, and disorders of the heart.

201.3 Explain the anatomy of digestive system and function of stomach includes acid production, pepsin role in protein digestion as well as anatomy of respiratory system.

201.4 Explain the anatomy and functions of respiratory system and kidney and nephrons includes artificial respiration and resuscitation methods, physiology of urine formation and disorders of kidney.

201.5 Understand the anatomy of male and female reproductive system includes its functions, physiology of menstruation, spermatogenesis, pregnancy and parturition as well as basics introduction of genetics.

3. **Text Books:**

TB.1 Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypeebrothers medical publishers, New Delhi.

TB.2 Rose and Wilson Anatomy and Physiology in Health and Illness by Anne Waugh and Allison Grant. Churchill Livingstone Elsevier, 12th edition.

4. **Reference Books:**

RB.1 Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
RB.2 Concise Medical Physiology by Sujit K. Chaudhuri, New Central Book Agency (NCBA), London.
RB.3 Gray's Anatomy for students, Richard L. Darke, A Wayne Vogl and Adam W. M. Mithell. Churchill Livingstone Elsevier, 3rd edition.

5. **Other Readings &Relevant Websites:**

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

6. **Course Plan:**

Subject : Human Anatomy Physiology-II (Theory)		Subject Code: BP201T
Sr. No.	**Topics**	**No. of Lectures**
1	**Body fluids and blood:** Body fluids, composition and functions of blood, hemopoeisis, formation of hemoglobin, anemia, mechanisms of coagulation, blood grouping, Rh factors, transfusion, its significance and disorders of blood, Reticulo endothelial system. **Lymphatic system:** Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system.	10
2	**Cardiovascular system:** Heart – anatomy of heart, blood circulation, blood vessels, structure and functions of artery, vein and capillaries, elements of conduction system of heart and heart**b**eat, its regulation by autonomic nervous system, cardiac output, cardiac cycle. Regulation of blood pressure, pulse, electrocardiogram and disorders of heart.	10
ST-I (Syllabus Covered from Lecture 01 to 20)		
3	**Digestive system:** Anatomy of GI Tract with special reference to anatomy and functions of stomach,(Acid production in the stomach, regulation of acid production through parasympathetic nervous system, pepsin role in protein digestion) small intestine and large intestine, anatomy and functions of salivary glands, pancreas and liver, movements of GIT, digestion and absorption of nutrients and disorders of GIT. **Respiratory system:** Anatomy of respiratory system with special reference to anatomy of lungs, mechanism of respiration, regulation of respiration.	06
4	**Respiratory system:** Lung Volumes and capacities transport of respiratory gases, artificial respiration and resuscitation methods. **Urinary system:** Anatomy of urinary tract with special reference to anatomy of kidney and nephrons, functions of kidney and urinary tract, physiology of urine formation, micturition reflex and role of kidneys in acid base balance, role of RAS in kidney and disorders of kidney.	10
5	**Reproductive system:** Anatomy of male and female reproductive system, Functions of male and female reproductive system, sex hormones, physiology of menstruation, fertilization, spermatogenesis, oogenesis, pregnancy and parturition. **Introduction to genetics:** Chromosomes, genes and DNA, protein synthesis, genetic pattern of inheritance.	09
ST- II(Syllabus Covered from Lecture 21 to 45)		

7. **Lecture Plan:**

Sr No.	Lecture Topics	CO	Dates (tentative)	
			Section A	Section B
01	Body fluids, composition and functions of blood.	201.1	22.07.24	22.07.24
02	Hemopoeisis, formation of hemoglobin.	201.1	23.07.24	23.07.24
03	Anemia, mechanisms of coagulation.	201.1	25.07.24	26.07.24
04	Blood grouping.	201.1	29.07.24	29.07.24
05	Rh factors, transfusion, its significance and disorders of blood.	201.1	30.07.24	30.07.24
06	Reticulo endothelial system.	201.1	01.08.24	02.08.24
07	Lymphatic organs and tissues.	201.1	05.08.24	05.08.24

08	Lymphatic vessels.	201.1	06.08.24	06.08.24
09	Lymph circulation and functions of lymphatic system.	201.1	08.08.24	09.08.24
10	Test	201.1	12.08.24	12.08.24
11	Heart – anatomy of the heart.	201.2	13.08.24	13.08.24
12	Blood circulation.	201.2	19.08.24	16.08.24
13	Blood vessels.	201.2	20.08.24	19.08.24
14	Structure and functions of artery.	201.2	22.08.24	20.08.24
15	Vein and capillaries.	201.2	26.08.24	23.08.24
16	Elements of conduction system of heart and heartbeat, its regulation by autonomic nervous system.	201.2	27.08.24	26.08.24
17	Cardiac output, cardiac cycle.	201.2	29.08.24	27.08.24
18	Regulation of blood pressure, pulse.	201.2	02.09.24	30.08.24
19	Electrocardiogram and disorders of heart.	201.2	03.09.24	02.09.24
20	Test	201.2	05.09.24	03.09.24
21	Anatomy of GI Tract with special reference to anatomy and functions of stomach (Acid production in the stomach, regulation of acid production through parasympathetic nervous system, pepsin role in protein digestion).	201.3	16.09.24	06.09.24
22	Small intestine and large intestine, anatomy and functions of salivary glands.	201.3	17.09.24	16.09.24
23	Pancreas and liver, movements of GIT, digestion and absorption of nutrients and disorders of GIT.	201.3	19.09.24	17.09.24
24	Anatomy of respiratory system with special reference to anatomy of lungs.	201.3	23.09.24	20.09.24
25	Mechanism of respiration, regulation of respiration.	201.3	24.09.24	23.09.24
26	Test	201.3	26.09.24	24.09.24
27	Lung Volumes and capacities transport of respiratory gases.	201.4	30.09.24	27.09.24
28	Artificial respiration and resuscitation methods.	201.4	01.10.24	30.09.24
29	Anatomy of urinary tract with special reference to anatomy of kidney and nephrons.	201.4	03.10.24	01.10.24
30	Functions of kidney and urinary tract.	201.4	07.10.24	04.10.24
31	Physiology of urine formation.	201.4	08.10.24	07.10.24
32	Micturition reflex.	201.4	10.10.24	08.10.24
33	Role of kidneys in acid base balance.	201.4	14.10.24	11.10.24
34	Role of RAS in kidney.	201.4	15.10.24	14.10.24
35	Disorders of kidney.	201.4	17.10.24	15.10.24
36	Test	201.4	21.10.24	18.10.24
37	Anatomy of male and female reproductive system, Functions of male and female reproductive system.	201.5	22.10.24	21.10.24
38	Sex hormones, physiology of menstruation.	201.5	24.10.24	22.10.24
39	Fertilization.	201.5	28.10.24	25.10.24
40	Spermatogenesis, oogenesis.	201.5	29.10.24	28.10.24
41	Pregnancy and parturition.	201.5	31.10.24	29.10.24
42	Chromosomes, genes and DNA.	201.5	04.11.24	04.11.24
43	Protein synthesis.	201.5	05.11.24	05.11.24
44	Genetic pattern of inheritance.	201.5	07.11.24	08.11.24
45	Test.	201.5	18.11.24	18.11.24

8. Tutorial Plan

Sr No.	Topic	Tentative date	
		(Sec A)	(Sec B)
1	Hemopoeisis, formation of hemoglobin.	26.07.24	27.07.24
2	Rh factors, transfusion, its significance and disorders of blood.	02.08.24	03.08.24
3	Lymphatic vessels.	09.08.24	10.08.24
4	Heart – anatomy of heart.	16.08.24	17.08.24
5	Blood vessels.	23.08.24	24.08.24
6	Elements of conduction system of heart and heartbeat, its regulation by autonomic nervous system.	30.08.24	31.08.24
7	Electrocardiogram and disorders of heart.	06.09.24	07.09.24

8	Acid production in the stomach, regulation of acid production through parasympathetic nervous system, pepsin role in protein digestion.	20.09.24	21.09.24
9	Movements of GIT, digestion and absorption of nutrients and disorders of GIT.	27.09.24	28.09.24
10	Mechanism of respiration, regulation of respiration.	04.10.24	05.10.24
11	Lung Volumes and capacities transport of respiratory gases.	11.10.24	12.10.24
12	Role of kidneys in acid base balance.	18.10.24	19.10.24
13	Role of RAS in kidney.	25.10.24	26.10.24
14	Sex hormones, physiology of menstruation.	02.11.24	02.11.24
15	Chromosomes, genes and DNA.	08.11.24	09.11.24

9. Assignments Plan:

Sr. No.	Type of Assignment	Assignment	Marks	CO	PO (AnnexureI)	Tentative Date
1	Subjective	Describe the mechanism of coagulation and Rh factor with significance and disorders of blood.	10	201.1	PO1,PO2, PO4, PO6, PO9	14.08.24
2	Survey- based	Prevalence of comorbidities in cardiovascular disease patients in different age group.	10	201.2	PO1, PO3, PO4, PO6, PO8, PO11	06.09.24
3	Objective	MCQs-based assignment with justification.	10	201.3	PO1, PO3, PO4, PO6, PO9, PO11	27.09.24
4	Flow Chart	Prepare a table on respiratory and urinary disorders "name of the disorder, Symptoms, Diagnosis test, and Medication therapy used.	10	201.4	PO1, PO4, PO6, PO11	22.10.24
5	Subjective	Assignment on protein synthesis and genetic pattern of inheritance.	10	201.5	PO1, PO2, PO4, PO6, PO9	19.11.24

10. Class Tests Schedule:

Sr. No.	Test Type	Topics	Marks	CO	PO (Annexure I)	Tentative Date
1	Subjective	Hemopoeisis, mechanisms of coagulation and lymph circulation	10	201.1	PO1, PO4, PO6, PO9	12.08.24
2	Objective	Overall Cardiovascular system	10	201.2	PO1, PO3, PO4, PO6, PO9, PO11	03.09.24 05.09.24
3	Subjective	Pepsin role in protein digestion, functions of salivary glands, mechanism of respiration and disorders of GIT	10	201.3	, PO4, PO6, PO9	24.09.24 26.09.24
4	Objective	Overall respiratory and urinary system	10	201.4	PO1, PO3, PO4, PO6, PO9, PO11	18.10.24 21.10.24
5	Subjective	Physiology of menstruation and protein synthesis.	10	201.5	PO1, PO4, PO6, PO9	18.11.24

11. Content Beyond Syllabus (CBS):

Sr. No.	Topics	PO to be Achieved(Annexure I)
1	Clinical psychology	PO1, PO3, PO4, PO5, PO6, PO8, PO9, PO11
2	Latest diagnostic equipments used in healthcare system	PO1, PO3, PO4, PO6, PO8, PO9, PO11

12. Proposed Activity:

Sr. No.	Type of	Topics	Tentative Date

	Activity		
1	Awareness Campaign	Awareness campaign by students on national cancer awareness day to the local people for the prevention of cancer	07.11.24

13. 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	
HOD	
Principal	

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 fulfilment 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.