

Punjab University College of Pharmacy
Faculty of Pharmacy
University of the Punjab, Lahore
Course Outline



Programme	Pharm.D 2nd Semester	Course Code	PHARM-119 (Theory), PHARM-120 (Lab)	Credit Hours	3+1
Course Title	Physiology-II				
Course Introduction					
Physiology is the branch of biological science that studies the normal functions and mechanisms of the human body. This course is designed to provide students with a comprehensive understanding of the functional processes that occur within the body. Students will learn how the body responds to internal and external changes through coordinated activities of different organs and systems. Major topics covered in this course include the functions of the circulation, respiratory, endocrine, urinary, reproductive, and immune systems. Emphasis is placed on understanding how these systems interact to maintain balance and support normal body activities. Practical applications of physiology will help students relate theoretical concepts to real-life health conditions, body responses, and clinical situations. Students may also study basic experiments, measurements, and physiological processes in laboratory settings.					
Learning Outcomes					
On the completion of the course, the students will be able to: 1. Explain the structure, formation, and functions of blood components, describe the process of blood clotting and blood typing, and relate these to common disorders like anemia and leukopenia. 2. Describe the structure and function of the circulatory and lymphatic systems, including blood vessels, and explain how blood pressure is regulated. 3. Explain how the respiratory system works, including gas exchange, breathing control, and the different lung volumes and capacities. 4. Describe kidney function and urine formation, and explain how the body maintains fluid, electrolyte, and acid-base balance. 5. Explain the physiology of the male and female reproductive systems, including gamete formation, the menstrual cycle, and stages such as puberty, pregnancy, and menopause.					
Course Content (Theory)			Assignments/Readings		
Week 1	Mechanisms of body temperature regulation		Barrett, K. E., Barman, S. M., Brooks, H. L., & Yuan, J. X. J. (2019). Ganong's review of medical physiology (26th ed.). McGraw-Hill Education.		
	Mechanisms of body temperature regulation				
	Pathophysiology fever and hypothermia				
Week 2	The blood cells		Hall, J. E. (2021). Guyton and Hall textbook of medical physiology (14th international ed.). Elsevier		
	Red blood cells, erythropoiesis				
	Formation and destruction of hemoglobin				
Week 3	Types of white blood cells, genesis of white blood cells		Hall, J. E. (2021). Guyton and Hall textbook of medical physiology (14th international ed.). Elsevier		
	Roles of different white blood cells, types of T-cells and their functions, B-cells and memory cells				
	Antibodies, formation of pus, anemia and leukopenia				

Week 4	Platelets, formation of platelet plug, mechanism of blood coagulation	Assignment: Prepare full chapter for assignment
	Extrinsic and intrinsic pathways of initiating clotting, lysis of blood clot	
	Blood types, agglutinogens, Rh blood types, plasma, serum.	
Week 5	Circulation, Basic theory of circulatory function	Widmaier, E. P., Raff, H., & Strang, K. T. (2023). Vander's human physiology: The mechanisms of body function (16th ed.). McGraw-Hill Education
	Structure and function of blood vessels (arteries, arterioles, capillaries, veins),	
	Blood pressure, total peripheral vascular resistance	
Week 6	Total pulmonary vascular resistance	Widmaier, E. P., Raff, H., & Strang, K. T. (2023). Vander's human physiology: The mechanisms of body function (16th ed.). McGraw-Hill Education
	Clinical methods of measuring systolic and diastolic blood pressures	
	Arterial pressure and baroreceptor reflex	
Week 7	Renin-angiotensin system	Assignment: attempt quiz from covered topics
	Hematocrit, lymph channels of the body	
	Formation of lymph	
Week 8	Respiratory Physiology, Physiological anatomy of lungs	Sembulingam, K., & Sembulingam, P. (2022). Essentials of medical physiology (9th ed.). Jaypee Brothers Medical Publishers
	Mechanism of inspiration and expiration	
	Definitions of various lung volumes and capacities	
Week 9	Exchange of gases in alveoli and tissues,	Sembulingam, K., & Sembulingam, P. (2022). Essentials of medical physiology (9th ed.). Jaypee Brothers Medical Publishers
	Transport of oxygen in blood, transport of carbon dioxide in Blood	
	Transport of hydrogen ions between tissues and lungs	
Week 10	Regulation of respiration,	Assignment: Attempt quiz from the covered lesson
	Pulmonary edema, pleural effusion	
	Non-respiratory functions of the Lungs.	

Week 11	Renal physiology Physiological anatomy of kidney and nephron	Firdaus, M. (2021). Firdaus review of physiology: Included MCQs and viva (21st ed.). Riaz Medical Publishers
	Functions of the kidney	
	Urine formation, formation of dilute and concentrated urine	
Week 12	Glomerular filtration, glomerular filtration rate (GFR),	Firdaus, M. (2021). Firdaus review of physiology: Included MCQs and viva (21st ed.). Riaz Medical Publishers
	Mechanisms of tubular reabsorption and secretion	
	Micturition, buffering of H ⁺ ion	
Week 13	Renal sodium regulation	Assignment: Attempt quiz from the reactions covered
	Renal potassium regulation	
	Renal water regulation	
Week 14	Endocrine and Reproductive Physiology .	Widmaier, E. P., Raff, H., & Strang, K. T. (2023). Vander's human physiology: The mechanisms of body function (16th ed.). McGraw-Hill Education
	Physiological roles of hormones secreted from major endocrine glands	
	Pituitary gland	
Week 15	Thyroid gland	Assignment: Attempt quiz from the reactions covered
	Adrenal gland	
	Pancreatic gland	
Week 16	Reproductive physiology including gametogenesis	Widmaier, E. P., Raff, H., & Strang, K. T. (2023). Vander's human physiology: The mechanisms of body function (16th ed.). McGraw-Hill Education.
	Menstrual cycle regulation	
	Life-stage transitions	
Textbooks and Reading Material		
Main source: Widmaier, E. P., Raff, H., & Strang, K. T. (2023). Vander's human physiology: The mechanisms of body function (16th ed.). McGraw-Hill Education.		
Other sources:		
1.Barrett, K. E., Barman, S. M., Brooks, H. L., & Yuan, J. X. J. (2019). Ganong's review of medical physiology (26th ed.). McGraw-Hill Education.		
2.Costanzo, L. S. (2024). BRS physiology (7th ed.). Wolters Kluwer		
3.Firdaus, M. (2021). Firdaus review of physiology: Included BCQs and viva (21st ed.). Riaz Medical Publishers.		
4.Hall, J. E. (2021). Guyton and Hall textbook of medical physiology (14th international ed.). Elsevier.		
5.Sembulingam, K., & Sembulingam, P. (2022). Essentials of medical physiology (9th ed.). Jaypee Brothers Medical Publishers		
6.Sherwood, L. (2016). Human physiology: From cells to systems (9th ed.). Cengage Learning.		
7.Wecker, L., & Ingram, S. L. (2024). Brody's human pharmacology: Mechanism-based therapeutics (7th ed.). Elsevier.		
8.Widmaier, E. P., Raff, H., & Strang, K. T. (2023). Vander's human physiology: The mechanisms of body function (16th ed.). McGraw-Hill Education.		

Course content (Practical/lab)				
At the end of this course the student will be able to: 1.Determine the Hemoglobin (Hb) content in human blood 2.Determine the erythrocyte sedimentation rate (ESR) in human blood 3.Determine the red blood cell count in human blood 4.Determine the bleeding time in human blood 5.Determine the coagulation time in human blood 6.Determine an individual's blood type using anti-sera for ABO and Rh typing. 7.Determine the lung tidal volume, inspiratory reserve volume, expiratory reserve volume and vital capacity. 8.Measure and record changes in respiratory rate and oxygen saturation under different conditions (e.g., at rest vs. after exercise). 9. Learn the technique of nebulization using normal saline as the nebulizing solution. 10. Learn cardiopulmonary resuscitation (CPR) technique using CPR manikin or dummy. 11.Demonstrate the importance of vector control in preventing the spread of dengue fever 12. Understanding pre-recorded heart and lung sounds				
Assignments: Types and Number with Calendar				
Assignment/presentation (20 marks)			Class quiz (30 marks)	
No.	Week	Deadline for submission	No.	Week
Assignment 1 (Pre-mid)	Week 3	Within the timeline assigned by the teacher	Quiz 1 (pre-mid)	Week 4
			Quiz 2 (pre-mid)	Week 7
Assignment 2 (Post-mid)	Week 11		Quiz 3 (post-mid)	Week 10
			Quiz 4 (post-mid)	Week 14