

**University of Baghdad – College of Veterinary Medicine – Department of Physiology,
Biochemistry and Pharmacology, 2023-2024**

عدد الوحدات	عدد الساعات		المادة
	العملي	النظري	
3			Metabolic regulation PhD/ 1 st semester
	2	2	
المفردات			الأسابيع
Signal transduction. Second messengers			1
Insulin Receptor signaling pathway. Warburg effects signaling pathway. Hypoxia inducible factor pathway			2
Metabolic pathways: Akt /PI3K pathway. mTOR pathway. AMPK pathway. MAPK/ ERK pathway.			3
Gene expression, principals and regulation			4-5
Structure and gene of mitochondria. Role of mitochondria in; Ca ⁺ and ROS production and thermogenesis			6-7
Midterm examination			8
Oxidative Damage and Disease			9
Oxidative Photophosphorylation and ATP production and Apoptosis			10
Regulation of CHO metabolism Glycolysis & Gluconeogenesis			11
Regulation lipids metabolism Fatty Acid Catabolism			12
Regulation of Proteins metabolism, Amino Acid Oxidation, Urea Cycle			13
Metabolic fuels & tissue variations and Metabolic adaptation in prolonged starvation			14
Final Examination			1

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عدد الوحدات	عدد الساعات		المادة
	العملي	النظري	
3	2	2	Respiratory Physiology PhD/1 st semester
المفردات			الأسابيع
Structure and function of the lung			1
Pulmonary Ventilation: - pleural pressure, alveolar pressure, airflow, and lung volume changes Pressure-volume (compliance). Mechanics of respiration. Lung volumes and capacities. Lung compliance, Surface tension. Air ways resistances. Regional differences in pulmonary ventilation in healthy and diseased lungs. Pneumothorax, atelectasis,			2-3
Anatomic dead space, physiologic dead space, wasted (dead space) ventilation. Hypoventilation, hyperventilation, hyper apnea, eupnoea, Hyponex, and hyperpnoea.			4
Pulmonary Circulation: - Regional differences in pulmonary blood flow, vascular resistance changes with alterations in cardiac output or pulmoary arterial pressure vascular resistance changes with alterations in cardiac output or pulmonary arterial pressure. Distention and recruitment of pulmonary vessels. Development of pulmonary edema. Hypoxia.			5
Gas exchange Gases diffusion. Alveolar Ventilation Partial pressure for gases.			6
Midterm Examination			7
Alveolar Ventilation: - Transport of a gas between alveolar gas and pulmonary capillary blood. ventilation/perfusion (V/Q) ratio. Define right-to-left shunts, anatomic and physiological shunts.			8
Gas Transport: -Oxygen and Carbon Dioxide: - Transport hemoglobin oxygen equilibrium curve. Henry's Law. hemoglobin dissociation curve. Anemia and carbon monoxide poisoning. the carbon dioxide dissociation curves. The chloride shift in the transport of CO ₂ by the blood. Haldane effect			9-10
Respiratory acidosis and alkalosis: - Clinical examples of each. Mechanism and function of respiratory acid base compensations.			11
Respiratory Control			12
Respiratory adaptation in: - Stress, High altitude, Flight			13-14
Final Examination			

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عدد الوحدات	عدد الساعات		المادة
	العملي	النظري	
3			Cardiovascular system PhD/1 st semester
	2	2	
المفردات			الأسابيع
Heart as a pump, cardiac cycle Cardiac output			1-2
Hemodynamic: Dynamic of blood flow, pressure, resistance			3-4
Capillary and lymph circulation			5
Arterial Arteriolar circulation			6
Midterm examination			7
Cardiovascular regulatory mechanism: local circulation, blood pressure			8-9
Interstitial fluid volume, venous circulation. Edema			10
Circulation through special region: Cerebral, Coronary, Splanchnic, Cutaneous and Placenta Fetal circulation			11
Vascular endothelial roles in health and diseases			12
Cardiovascular disease-hypertension-heart failure. Shock in injury. Allergic reaction. Hemorrhage			13-14
Final Examination			

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عدد الوحدات	عدد الساعات		المادة
	العملي	النظري	
2	-	2	Cell Physiology PhD/1st semester
المفردات			الأسابيع
Principles of cell organelles and membrane Function			1
Maintenance of cellular homeostasis			2
Cell transporters types according to structure and function and their regulation and Cell membrane Transport mechanisms			3
Types of receptors			4
Types of second messengers			5
Midterm examination			6
Excitable tissue, action potential in a nerve cell, cardiac muscle and smooth muscles.			7
Muscle molecular basis of contraction and relaxation skeletal , cardiac and smooth muscle			8
Dystrophic and muscle disease. Aging			9
Synapses, Synaptic transmission, Pre-and postsynaptic structure and function.			10
Neurotransmitter system			11
Nucleic acids , structure , functions, replication and transcription			12
Gene expression regulation and protein synthesis and cell proliferation and types of divisions			13-14
Final Examination			

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Renal system Physiology PhD/1 st semester
	2	2	
المفردات			الأسابيع
Introduction, Functions of kidneys			1
Functional Morphology of the kidney			2
Basic renal processes			3
Renal handling of organic substances			4
Renal Clearance			5
Midterm examination			6
Renal hemodynamic			7
Basic renal processes for Na, Cl, and water			8-9
Role of kidney in regulation of Extracellular volume and osmolarity			10-11
Role of kidney in regulation of K ion			12
Role of kidney in regulation of Ca ion balance			13
Role of kidney in regulation of acid – base balance			14
Final Examination			

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Clinical physiological chemistry
	2	2	PhD/ 2 nd semester
المفردات			الأسابيع
Laboratory information, Requesting of laboratory test and their interpretation to the result, abnormal protein investigation			1
Tumor biomarkers			2
Disorder of adrenal glands and their investigation			3-4
Disorder of thyroid gland and their investigation			5
Bone and muscle diseases, Rhabdomyolysis			6
Midterm examination			7
Hyperlipidemia, obesity, adipose tissue and its relation to insulin resistance and metabolic syndrome			8-9
Cardiac infarction marker, Risk factors of atherosclerosis			10
Digestive system gastric, intestinal, liver and pancreatic disease			11-12
Renal failure: Acute and chronic markers			14
Final Examination			

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Advance Pharmacology
	2	2	PhD/2 nd semester
المفردات			الأسابيع
Inflammation,			1
Drug distribution, clearance and excretion and drug interaction			2 – 4
Histamine, Bradykinin, and Their Antagonists			5
Drug affecting Cardiovascular system			6
Anti-Inflammatory, Antipyretic, and Analgesic Agents; Pharmacotherapy of Gout			7
Midterm examination			8
Immunomodulation, Immunosuppressants, and Tolerogens,			9
Hematopoietic Agents: Growth Factors, Minerals, and Vitamins			10
Pulmonary Pharmacology			11
Drugs Affecting Gastrointestinal Function; Pharmacotherapy of Gastric Acidity, Peptic Ulcers, and Gastroesophageal; Reflux Disease treatment of Disorders of Bowel Motility and Water Flux; Anti-Emetics; Agents, Used in Biliary and Pancreatic Disease			12-13
Endocrine Pancreas and Pharmacotherapy of Diabetes Mellitus and Hypoglycemia			14
Final Examination			

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عدد الوحدات	عدد الساعات		المادة
	العملي	النظري	Special topics in Physiology PhD/2 nd semester
		2	
المفردات			الأسابيع
Hematology: Hematopoietic system Bone marrow cells differentiation, RBCs production, metabolism, kinetics Platelets and hemostasis WBS role in inflammation and immunity			1-4
Midterm examination			5
Fertility in lab animals: Regulation. Investigation, and evaluation			7-10
Fertility in farm animals			11-14
Final Examination			

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Immunity
	2	2	PhD/2 nd semester
المفردات			الأسابيع
Introduction to immune system			1
Innate and acquired immunity			2
Basic renal processes			3
Humoral, antibody mediated immunity			4
Cellular mediated immunity			5
Mid Term examination			6
Major histocompatibility complex's: Classification			7
Immunity pathways,			8-9
Lectin pathway			10
classical pathway			11
Alternative pathway			12
Complement system			13- 14
Final Examination			

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Blood physiology PhD/2 nd semester **NEW**
	2	2	
المفردات			الأسابيع
Introduction to blood composition and functions			1
Hematopoietic system, hematopoiesis, regulation, theories about HPSCs differentiation			2
Red blood cells, origin, production, life span, physiology and metabolism of RBCs, kinetics of RBCs, Functions, Share stress effects on RBCs.			3
RBCS deformability, in health and disease			4
Platelets, production, physiology, structure			5
Role of platelets in hemostasis, Role in inflammation			6
Midterm Examination			7
Hemostasis, pathways			8
Role of endothelial in hemostasis			
Hyper and hypo coagulation capacity			9
WBCs types, production, kinetics' and migration			10
Metabolic regulation of effector immunocytes, Tcell, and macrophage			11-12
Epigenetic regulation of effector immunocytes lineage.			
Responses of WBCs and kinetics in disease conditions			13-14
Final examination			

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عدد الوحدات	عدد الساعات		المادة
2	العملي	النظري	Nervous system physiology PhD/1 st semester **NEW**
		2	
المفردات			الأسابيع
Structure of Nervous System: Introduction to anatomy of brain and spinal cord			1
Blood Supply, Blood-Brain Barrier Phenomena, and Cerebrospinal Fluid			2
Motor Functions of the Spinal Cord; the Cord Reflexes			3
Cortical and Brain Stem Control of Motor Function			4
Contributions of the Cerebellum and Basal Ganglia to Overall Motor Control			5
Cerebral Cortex, Intellectual Functions of the Brain, Learning and Memory			6-7
Midterm exam			8
The Sense of Hearing: Anatomy of ear, Cochlea, Hearing receptors Central Auditory Mechanisms			9
Behavioral and Motivational Mechanisms of the Brain—The Limbic System and the Hypothalamus			10
The Eye: Vision; Visual receptors, Neurophysiology of Vision (visual pathway), Accommodation, Visual disorders			11
Somatic Sensations: Pain, and Thermal Sensations			12
Structure of Nervous System: Introduction to anatomy of brain and spinal cord			13
Blood Supply, Blood-Brain Barrier Phenomena, and Cerebrospinal Fluid			14
Final examination			