

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

عدد الوحدات	عدد الساعات		المادة
	العملي	النظري	
4	2	3	Advanced physiology Msc.
المفردات			الأسابيع
The cell and its function: Structure of cell, The cell membrane structure, Cell membrane Transporter mechanisms, Organelles, Cells communications.			1
Physiology of nerve, excitable cells (nerve and muscle), Action potential, Synaptic transmission .			1
Contraction and excitation of skeletal muscle, cardiac and smooth muscle,			1
Organization of autonomic nervous system (ANS), principle of neurotransmitters and receptors.			1
Physiology of blood: Hematopoitic system , RBCs life cycle, Hemoglobin Blood groups. Kinetics of WBCs,			3
Midterm Examination			1
The heart as a pump: Physiology of cardiac muscle, The cardiac cycle, The specialized excitatory and conductive systyem of the heart, Heart sound, The normal electrocardiogram, Cardiac output and regulation Blood pressure and normal regulation			2
The kidney and body fluid: Body fluid compartments, Constituents of extracellular and intracellular fluid Oedema Renal function, Renal circulation Basic anatomy of the kidney, Glomerular filtration, Reabsorption and secretion, Formation of urine by the kidney, Micturation, Renal regulation of acid-base balance			2
Respiration: Pulmonary functions, Gas transport between lungs and tissues Pulmonary circulation, Regulation of respiration, Neural control of respiration, Chemical control of respiration			2
Final Examination			1

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عدد الوحدات	عدد الساعات		المادة
4	العملي	النظري	Advanced Biochemistry Msc.
	2	3	
المفردات			الأسابيع
Cellular environment: Water and solutes; Buffer system of blood; Functional role of subcellular organelles; Biochemical membrane structure and membrane transport; How Biological molecules stick together.			1
Bioenergetics and oxidative Metabolism: Energy - producing and energy utilizing systems; Thermodynamic relationship and energy rich compounds; source and fates of acetyl coenzyme A; structure and compartmentation by mitochondrial membranes; Electron transfer; oxidative phosphorylation.			2
Carbohydrates metabolism I : Glycolysis, The glycolytic pathway; " regulation of glycolysis; Tricarboxylic acid cycle; Gluconeogenesis; Glycogenolysis; Glycogenesis.			2
Carbohydrate metabolism \I: Pentose phosphate pathway; sugar interconversion and nucleotide sugar formation; Biosynthesis of complex carbohydrates; Glycoproteins Proteoglycons.			2
lipid chemistry and metabolism: Chemical nature of fatty acids; storage of fatty acids and triglycerides ; methods of inter organs transport of fatty acids and their primary products, -utilization of fatty acids for energy production, lipid peroxidation and free radicals.			1
Midterm Examination			1
lipid metabolism: Pathways of metabolism of special lipids phospholipids, cholesterol; sphingolipids ; prostaglandins and thromboxanes; lipoxygenase and oxy-Eicosatetraenoic acid, Hyperlipidemias, Atherosclerosis, reactive oxygen species :Free radicals oxidative stress ,antioxidant.			1
Amino acid metabolism: Incorporation of nitrogen into amino acids transport of nitrogen to liver, Kidney , urea cycle, synthesis and degradation of deficiency; deficiencies of urea cycle enzymes; phenylketonuria, hypercystinemia and atherogenesis			1

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Biochemistry of hormones: I-Polypeptide hormones: Hormones and hormone cascade system; major polypeptide hormones and their actions; genes and formation of polypeptide hormones; synthesis of amino acids —Derived hormones inactivation and degradation of cascade systems; hormone receptor interaction.	2
II -Steroid hormones Biosynthesis of steroid hormones; metabolic inactivation of steroid hormones; cell-cell communication and control of synthesis and release of steroid hormones; transport of steroid hormones in blood, steroid hormone receptors, Receptor activation up regulation and down regulation	
Free radical and antioxidant	1
Final Examination	1

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Biochemical technique
	2	2	Msc.
المفردات			الأسابيع
Blood sampling, factors affect evaluation of general laboratory tests and interpretation of results.			1
Methods for extraction of plants and other material			1
Immunohistochemistry, principle of work and application			1
Protein in blood and urine, disorders of protein metabolism			1
Plasma lipid, lipoproteins and hyperlipidaemia.			1
Enzymes as biomarkers of clinical importance in disease. Purification of enzymes and it's kinetics.			2
Midterm Examination			1
Pancreas: Carb related disease and clinical biomarkers of diabetes mellitus.			1
HPLC, GC and electrophoresis.			1
General Urine analysis, biomarkers of clinical pathological constituents of urine, sediment. Examination.			1
Estimation of Free radicals and oxidative stress markers in body's fluid and tissues Antioxidant, enzyme and non-enzymatic, lipid peroxidation.			2
Liver function and clinical biomarkers of liver disease.			1
Final Examination			1

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عدد الوحدات	عدد الساعات		المادة
2	العملي	النظري	Digestive system Msc.
	—	2	
المفردات			الأسابيع
General description of digestive systems in different animals Function of digestive system, neural and blood supply			1
Regulation of digestive system, neural and humoral and reflexes			1
Journey of food : from the mouth, chemical and mechanical digestion			1
Gastric secretion and motility role in digestion			1
Small Intestine movement and secretion for digestion			1
Hepato-biliary system and pancreas secretion and function			1
Mid -term examination			1
Large intestinal role in digestion			1
Complex stomach, Ruminant digestion			1
Nutrient digestion and absorption :CHO digestion , absorption, Fatty acid digestion , absorption, Protein digestion , absorption			2
Food intake regulation: Neural and hormones involved in food intake			1
Gut microbiota role in healthy gut			1
Immunity of digestive tract			1
Final Examination			1

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Avian physiology
	2	2	Msc.
المفردات			الأسابيع
Respiration			1.5
Overview			
Anatomy of the avian respiratory			
Ventilation and respiratory mechanism			
Gas transport by blood			
Control of breathing			
Endocrinology			2
Anatomy of hypothalamic – hypophyseal complex			
Gonadotropins			
Thyroid			
The parathyroid, calcitonin and vitamin D			
Adrenals			
Pancreas			
Pineal gland and circadian rhythmus			
Reproduction in male birds			
Reproductive tract anatomy			

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Hormonal control of testicular functions	1.5
Spermatogenesis	
Mid-Term Examination	1
Reproduction in female birds	3
Anatomy of the reproductive system	
Follicles, Ovulation , oviposition	
Ovarian hormones	
Formation of yolk albumin , organic matrix and shell	
Renal physiology in birds	3
Introduction	
Intake of water and solutes	
Anatomical organization of the kidneys	
Osmoregulation	
Salt glands	
Evaporative water loss	2
Digestive system	
Anatomical organization, accessory glands, hormones, enzymes.	1
Final Examination	

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Advance Endocrinology Msc.
	2	2	
المفردات			الأسابيع
1-introduction			
Functions of hormones , Characteristics of the endocrine system Hormone synthesis and secretion, Hormone transport, Feedback control of hormone production ,General principles of hormone action, Quantification of hormone in biological fluids			2
2-The pituitary gland			
Gross and developmental anatomy, Hypothalamic control of pituitary gland function ,Pituitary protein hormones, Pituitary glycoprotein hormones, Hormones of the neurohypophysis, Disorders of pituitary function, Pituitary – like hormones of the placenta.			1.5
3-The thyroid gland			
Structure and function of the thyroid gland, Histology of the thyroid gland, Synthesis of thyroid hormone, Secretion of thyroid hormone Thyroid hormone metabolism, Biological action of thyroid hormone Disorders of thyroid function, Thyroid function test			1.5
4-The calcium regulation hormones (parathyroid hormone , calcitonin and cholecalciferol			
A-Calcium metabolism :			2
Functions of calcium , Renal handling of calcium , Intestinal absorption of calcium , Phosphate metabolism , serum phosphate			
B –parathyroid hormone:			

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Anatomy of the parathyroid glands, Functional cytology of the parathyroid gland, Synthesis of parathyroid hormone , Secretion and storage of parathyroid hormone, Control of parathyroid hormone secretion, Biological effect of parathyroid hormone secretion, Receptors , mechanism of action of parathyroid hormone	
C –Calcitonin	
Cell in thyroid or ultimobranchial glands synthesis of calcitonin, Regulation of calcitonin secretion, Biological effect of calcitonin secretion, Physiological significance of calcitonin.	
D – Cholecalciferol	
Activation of vitamin D3, Chemistry of vitamin D and metabolites , Biological effect of vitamin D3, E – Disorder of parathyroid function, Hyperparathyroidism, Hypoparathyroidism	
Midterm examination	1
The pancreas	1.5
Anatomy β-cell polypeptide, Pancreatic hormones, Insulin, Effects of insulin, Insulin – like growth factor , α-cell polypeptide-Glucagon. Effects of glucagon, δ-cell polypeptide -somatostatin, f-cell polypeptide---pancreatic polypeptide , Dysfunction of endocrine pancreas, Diabetes mellitus, Hypoglycemia	
The adrenal gland	
Anatomy , Adrenal cortex , Adrenal medulla, ACTH, Adrenal steroids , structure , biosynthesis, transport, metabolism and elimination steroids, Glucocorticoids , regulation and secretion , Stress, Physiology effect of glucocorticoids, Dysfunction of adrenal cortex Adrenal medulla, Biosynthesis release and fate of catecholamines. Mechanism of action of catecholamines, Physiological effect of epinephrine and norepinephrine.	1.5
Adipose tissue: White and Brown adipose tissue, Hormone of adipose tissue: leptin, adiponectin, resistin, visfatin.	1

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- Pineal gland: Chemistry, histological features, function, melatonin, biochemistry, biosynthesis, physiological function.	1
- Prostaglandins: Chemistry, biosynthesis, physiological function and types.	1
Final Examination	1

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عدد الوحدات	عدد الساعات		المادة
3	العملي	النظري	Reproductive physiology
	2	2	Msc.
المفردات			الأسابيع
The Biology of sex: Introduction, Sex differentiation, Development of male and female reproductive organs, sexual behavior, pheromones			3
Male reproductive system: Introduction, Excurent tract, Factors affecting spermatogenesis, Control of spermatogenesis, Steroidogenic function, Sertoli and Leydig's cell, Testis pituitary relationships, Accessory sex glands, Biology of spermatozoa, Fertility – infertility, sperm capacitation.			4
Mid-Term Examination			1
Female reproductive system: Introduction, Ovaries, Ovarian follicles and their types: ovarian hormones, estrogen and progesterone, Puberty, Factors affecting puberty: Gonadal steroid transport and mechanism action, The estrus cycle, Ovarian change during the estrus cycle.			6
Final Examination			1