



1.	Course title	Endocrine system	
2.	Course number	0500222	
3.	Credit hours	2.5 Theory	0.5 Practical
	Contact hours (theory, practical)	39 Lectures and 3 Labs	
4.	Prerequisites/Corequisites	--	
5.	Program title	MD	
6.	Program code	05	
7.	Awarding institution	The University of Jordan	
8.	School	School of Medicine	
9.	Department	Anatomy/histology/physiology/biochemistry/pathology/pharmacology/internal medicine	
10.	Course level	Bachelor	
11.	Year of study and semester (s)	Second year/ Second Semester	
12.	Other department (s) involved in teaching the course	-	
13.	Main Learning language	English	
14.	Learning Types	<input type="checkbox"/> Face to face learning <input checked="" type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15.	Online platforms(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16.	Issuing/Revision Date	30/12/2023	

17. Course Coordinator:

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23. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome (SLO)	Descriptors**	Learning Types (Face to Face/Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1	1.1	Anatomy/embryology/Histology (Introduction)	<p>Review differences between endocrine and exocrine glands.</p> <p>Review organogenesis of glands.</p> <p>List the endocrine glands.</p> <p>Describe the general structure of endocrine glands.</p> <p>Describe the connection and the role of hypothalamus in endocrine glands function.</p>	<p>K</p> <p>K</p> <p>K</p> <p>K</p> <p>S</p>	Face to face		Synchronous Lecturing	Written exam	28.A,B , C
	1.2	Anatomy/embryology/Histology (Pituitary gland)	<p>Identify the location, relation, blood, lymphatic drainage, nerve supply of pituitary gland.</p> <p>Know the organogenesis of pituitary gland.</p> <p>Describe the structure of pituitary glands and its relation to hypothalamus.</p> <p>Describe the histological appearance of the different parts of pituitary glands and their cellular composition.</p> <p>Identify the hypothalamic-hypophyseal tract and portal circulation</p> <p>Identify the possible complications in anatomical relations as a result of pituitary diseases.</p>	<p>K</p> <p>K</p> <p>K</p> <p>K</p> <p>K</p> <p>S</p>	Face to face		Synchronous Lecturing	Written exam	28.A,B , C



1.3	Anatomy/embryology/Histology (Thyroid gland)	<p>Identify the location, relation, blood, lymphatic drainage, nerve supply of thyroid gland.</p> <p>Know the organogenesis of thyroid gland.</p> <p>Describe the structure of thyroid glands.</p> <p>Describe the follicles, follicular and parafollicular cells.</p> <p>Describe the aberrations in thyroid gland organogenesis and possible complications due to that.</p>	<p>K</p> <p>K</p> <p>K</p> <p>K</p> <p>S</p>	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A,B , C
1.4	Anatomy/embryology/Histology (Parathyroid gland)	<p>Identify the location, relation, blood, lymphatic drainage, nerve supply of parathyroid gland.</p> <p>Know the organogenesis of parathyroid gland.</p> <p>Describe the structure of parathyroid glands.</p> <p>Describe the chief and oxyphil cells</p>	<p>K</p> <p>K</p> <p>K</p> <p>S</p>	Face to face		Synchronous Lecturing	Written exam	28.A,B , C
1.5	Anatomy/embryology/Histology (Adrenal gland)	<p>Identify the location, relation, blood, lymphatic drainage, nerve supply of adrenal gland.</p> <p>Know the detailed histological appearance of cortex and medulla in adrenal gland.</p> <p>Describe the differences between different zones in adrenal cortex.</p> <p>Describe the histological features in each zone and correlate that with the hormone secreted.</p>	<p>K</p> <p>K</p> <p>K</p> <p>S</p>	Face to face		Synchronous Lecturing	Written exam	28.A,B , C
1.6	Anatomy/embryology/Histology (Pancreas and pineal glands)	<p>Identify the location, relation, blood, lymphatic drainage, nerve supply of pancreas and pineal glands.</p>	<p>K</p> <p>K</p>	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A,B , C



		<p>Differentiate between the endocrine and exocrine portions of the pancreas.</p> <p>Identify the microscopic appearance of islets of Langerhans and the different cell subpopulations.</p> <p>Identify the microscopic appearance of pineal glands, and differentiate between secretory cells and glial cells.</p>	K					
1.7	Histology lab	<p>Examine a set of microscopic slides for glands using light microscopic images/ virtual microscopy laboratory.</p> <p>Discussion.</p>	S	Face to face		Synchronous Lecturing	Written exam	28.A,B , C
1.8	Histology lab	<p>Examine a set of microscopic slides for glands using light microscopic images/ virtual microscopy laboratory.</p> <p>Discussion.</p>	S	Face to face		Synchronous Lecturing	Written exam	28.A,B , C
1.9	Physiology Hypothalamic-pituitary relationship	<p>Describe adeno and neurohypophyseal hormone actions.</p> <p>Describe the regulation of anterior pituitary hormones by the hypothalamus.</p> <p>Describe the posterior pituitary gland relationship with the hypothalamus.</p>	K K K	Face to face		Synchronous Lecturing	Written exam	28.A
1.10	Physiology Adenohypophyseal hormones	<p>Describe growth and metabolic effects of growth hormone.</p> <p>List the principal insulin-like growth factors and describe their relationship to the actions of growth hormone.</p> <p>Describe the regulation of growth hormone secretion.</p> <p>Describe the role of the hypothalamus, growth hormone releasing hormone and somatostatin in the control of growth hormone secretion.</p>	K K K K	Face to face		Synchronous Lecturing	Written exam	28.A
1.11	Physiology Posterior pituitary hormones	<p>Discuss the physiological effects of antidiuretic hormone.</p>	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A



			Describe the regulation of antidiuretic hormone secretion.	K					
			List the major physiological effects of oxytocin.	K					
			Describe the regulation of oxytocin secretion.	K					
	1.12	Physiology Thyroid hormones	Describe physiological aspects related to the formation and secretion of thyroid hormones. Characterize physiological consequences of thyroid hormones binding to transporting proteins. List the main physiological actions of thyroid hormones. Describe the regulation of thyroid hormones secretion.	K K K K	Face to face		Synchronous Lecturing	Written exam	28.A
	1.13	Physiology Hormonal control of calcium metabolism	Discuss absorption, metabolism and excretion of calcium and phosphate. Describe metabolism of vitamin D, parathormone and calcitonin. Describe physiological effects and regulation of vitamin D, parathormone and calcitonin.	K K K	Face to face		Synchronous Lecturing	Written exam	28.A
	1.14	Physiology Endocrine functions of the pancreas 1	Discuss principal hormones that affect blood glucose concentration. Discuss metabolic effects of insulin. Discuss the regulation of insulin secretion. Discuss physiological effects of glucagon. Describe the regulation of glucagon secretion.	K K K K K	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A
2	2.1	Physiology Mineralocorticoids and adrenal medullary hormones	Describe physiological effects of mineralocorticoids (aldosterone). Discuss the regulation of aldosterone secretion. Describe the clinical consequences of hypo and hyperaldosteronism.	K K K	Face to face		Synchronous Lecturing	Written exam	28.A



		<p>List the catecholamines secreted by the adrenal medulla.</p> <p>Describe the actions of catecholamines in human body.</p> <p>List the factors that regulate adrenal medullary secretion.</p>	K					
2.2	<p>Physiology</p> <p>Glucocorticoids</p>	<p>Describe the major physiological effects of glucocorticoids.</p> <p>Discuss the regulation of cortisol secretion.</p> <p>Describe the clinical consequences of hypo- and hyperadrenalism.</p>	K	Face to face		Synchronous Lecturing	Written exam	28.A
2.3	<p>Physiology</p> <p>Sexual function of the male and female</p>	<p>Describe the testicular function, spermatogonia and male hormonal patterns.</p> <p>Characterize the ovarian function.</p> <p>Understand the hormonal patterns of the menstrual cycle.</p> <p>Review the control of hormonal patterns in the female.</p>	K	Blended	Moodle	Synchronous Lecturing	Written exam	28.A
2.4	<p>Biochemistry</p> <p>Introduction to biochemical endocrinology</p>	<p>Understand nature of hormones and describe hormone biosynthesis, secretion and transport.</p> <p>Understand targeting delivery and response of hormones.</p> <p>Understand hormonal interactions (systemic, cellular, synergistic and inhibitory).</p> <p>Understand regulation of hormone secretion and feedback mechanisms.</p>	K	Face to face		Synchronous Lecturing	Written exam	28.A
2.5	<p>Biochemistry</p> <p>(Mechanism of hormone actions I)</p>	<p>Understand G-protein coupled receptors: components (receptor, transducer, amplifier and intracellular messenger) and amplifier mechanisms (cAMP, phosphoinositoldiphosphate (PIP2) and ion channels).</p> <p>Understand PIP2 turnover (Ca²⁺/protein kinase C systems).</p>	K	Face to face		Synchronous Lecturing	Written exam	28.A



		Describe Ca ²⁺ homeostasis and actions of inositoltriphosphate (IP ₃). List actions of diacylglycerol (DAG). List hormones that act through PIP ₂ turnover.	K K					
2.6	Biochemistry (Mechanisms of hormone actions II)	Describe peptide backbone of G-protein coupled receptors. Describe cycle of G-protein activation. List intracellular actions of cAMP. Describe tyrosine kinase receptors in depth. List examples of intracellular receptors: glucocorticoid, mineralocorticoid, estrogen, androgen, progesterone, thyroid and vitamin D. Describe the role of intracellular receptors in the regulation of gene expression.	K K K K K	Face to face		Synchronous Lecturing	Written exam	28.A
2.7	Biochemistry (Steroidogenesis)	Describe the biosynthesis of steroid hormones. Describe the role of cytochromes P-450 in steroidogenesis. Describe sex hormone biosynthetic pathways. Understand the regulation of sex hormone biosynthesis through hypothalamus pituitary-gonadal axis in the male and female.	K K K K	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A
2.8	Pharmacology Introduction and hormone receptors	Understand the importance of hormonal regulation and basic principles of hormonal therapy. Describe the chemical nature of hormones and their major sources. Correlate the clinical implication in the use of hormones.	K K S	Face to face		Synchronous Lecturing	Written exam	28.A
2.9	Pharmacology Pharmacology of hypothalamic and	Describe the pharmacology of hypothalamic hormones CRH, TRH, GHRH, GHIH, and dopamine.	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A



		anterior pituitary hormones	describe the pharmacology of the anterior pituitary hormones ACTH, TSH, GH and prolactin and major clinical uses to dopamine agonists.	K					
	2.10	Pharmacology Pharmacology of thyroid hormones	List the major sources and understand the clinical uses and side effects to thyroid hormones. Understand the pharmacology of antithyroid agents.	K K	Face to face		Synchronous Lecturing	Written exam	28.A
	2.11	Pharmacology Pharmacology of parathyroid gland	Understand the pharmacology of parathyroid hormone and its major antagonists.	K	Face to face		Synchronous Lecturing	Written exam	28.A
	2.12	Pharmacology Pharmacology of adrenal gland hormones	Understand the pharmacology of aldosterone. Understand the pharmacology of different preparations to cortisol, their clinical uses and side effects.	K K	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A
	2.13	Pharmacology Pharmacology of adrenal gland hormones	Describe the clinical uses to inhibitors of cortisol biosynthesis. Comprehend the major criteria that should be adopted in the clinical use of corticosteroids.	K K	Face to face		Synchronous Lecturing	Written exam	28.A
	2.14	Midterm exam							
3	3.1	Pharmacology Pharmacology of pancreatic hormones	Describe the pharmacology of insulin including its major pharmacological effects, sources, different available preparations, routes of administration and major side effects.	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A
	3.2	Pharmacology Pharmacology of pancreatic hormones	Understand the pharmacology of different classes to oral hypoglycemic agents	K	Face to face		Synchronous Lecturing	Written exam	28.A
	3.3	Pathology Non neoplastic thyroid diseases	List non neoplastic diseases of the thyroid gland Describe goiter, its causes and pathogenesis Describe the features of hyper and hypoparathyroidism	K K K	Blended	Moodle	Synchronous Lecturing	Written exam	28.A
	3.4	Pathology Neoplastic thyroid diseases	List types of thyroid tumors Appraise genetic mutations in various types of thyroid tumors	K S S	Face to face		Asynchronous Lecturing	Written exam	28.A



			Compare papillary and follicular carcinomas						
3.5	Pathology Parathyroid gland	List causes of hypothyroidism and describe their pathogenesis List causes of hyperthyroidism and describe their pathogenesis	K K	Face to face		Synchronous Lecturing	Written exam	28.A	
3.6	Pathology Adrenal gland	List diseases of the adrenal gland Describe the pathogenesis of adrenal gland diseases.	K K	Face to face		Synchronous Lecturing	Written exam	28.A	
3.7	Pathology Pituitary gland	List diseases of the pituitary gland. Describe the pathogenesis of pituitary gland diseases	K K	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A	
3.8	Pathology Diabetes	List types of DM and describe their pathogenesis Describe the complications of DM	K K	Face to face		Synchronous Lecturing	Written exam	28.A	
3.9	Pathology lab	Appraise the histopathological changes of common thyroid diseases.	S	Blended	Moodle	Synchronous Lecturing	Written exam	28.A	
3.10	Pathology lab	Appraise the histopathological changes of common thyroid diseases.	S	Blended	Moodle	Asynchronous Lecturing	Written exam	28.A	
3.11	Internal medicine	To be assigned	K	Blended	Moodle	Synchronous Lecturing	Written exam		
3.12	Internal medicine	To be assigned	K	Blended	Moodle	Synchronous Lecturing	Written exam		
3.13	Revision								
3.14	Final exam								

** K: Knowledge, S: Skills, C: Competency



24. Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Descriptors**	Period (Week)	Platform
Midterm exam	40	Subjects covered in anatomy, embryology, histology, and physiology.	1.1-1.6, 1.9-1.14, 2.1-2.3	K S	TBA	Paper-based exam
Practical exam	20	Subjects covered in anatomy, histology, and pathology.	1.7, 1.8, 3.8, 3.9	C	TBA	Paper-based exam
Final exam	40	Subjects covered in biochemistry, pathology, and pharmacology.	2.4-3.8	K S C	TBA	Paper-based exam

** K: Knowledge, S: Skills, C: Competency

25. Course Requirements

- ✓ Class room Lectures
- ✓ Internet connection
- ✓ Online educational material using Moodle platform (Electronic Videos and Activities)
- ✓ Histology Lab

26. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- ✓ Class room Lectures
- ✓ Interactive Videos and Animations
- ✓ Online activities and assignments
- ✓ Open Laboratory sessions
- ✓ Discussion sessions and forums
- ✓ Game- based learning

27. Course Policies:

**A- Attendance policies:**

Attendance will be monitored by the course coordinator. Attendance policies will be announced at the beginning of the course.

B- Absences from exams and handing in assignments on time:

Will be managed according to the University of Jordan regulations. Refer to <http://registration.ju.edu.jo/Documents/daleel.pdf>

C- Health and safety procedures:

Faculty Members and students must at all times, conform to Health and Safety rules and procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this course and also integrity in your behavior in and out of the classroom. Students violate this policy would be subjected to disciplinary action according to University of Jordan disciplinary policies

E- Grading policy:

Grade-point average, Rules are preset by the Faculty and Department Councils

F- Available university services that support achievement in the course:

Availability of comfortable lecture halls, data show, internet service and E learning website <https://elearning.ju.edu.jo/> .

28. References:**A. Required book (s), assigned reading and audio-visuals:**

1. **Junqueira's Basic Histology**, Text and Atlas, 15th edition, By Anthony L. Mescher
2. **Snell's clinical anatomy by regions**, 10th edition, By Lawrence E. Wineski.
3. **Harper's Biochemistry**. By Robert K. Murray and Co., Latest edition.
4. **Katzung's basic and clinical pharmacology**, Latest Edition.
5. **Guyton and Hall textbook of Medical Physiology**, 12th Edition, John E. Hall.
6. **Robbins & Cotran Pathologic Basis of Disease**, Vinay Kumar, Abul K. Abbas, Nelson Fausto, Jon Aster

B. Recommended books, materials, and media:

1. **Color Textbook of Histology**, 4th edition, by Leslie P. Gartner & James L. Hiatt.
2. **Grays Anatomy for Students**, Richards Drake & Wayne Vogl & Adam W. M. Mitchell

C. Web based resources:

1. <http://www.histologyguide.org/index.html>
2. <https://histology.siu.edu/erg/enguide.htm>
3. <https://v15.proteinatlas.org/learn/dictionary/normal>



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