Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	265/2024/24/3/2
	The Date of the Deans Council Approval Decision	2024/1/23
	Number of Pages	06

1.	Course Title	Endocrine system
2.	Course Number	0500222
3.	Credit Hours (Theory, Practical)	2.5 Theory + 0.% Practical
	Contact Hours (Theory, Practical)	35 Lectures and 3 Labs
4.	Prerequisites/ Corequisites	--
5.	Program Title	MD
6.	Program Code	05
7.	School/ Center	School of Medicine
8.	Department	Anatomy and histology /physiology and biochemistry /pathology/ pharmacology/internal medicine
9.	Course Level	Bachelor
10.	Year of Study and Semester (s)	Second year/ Summer Semester
11.	Program Degree	Bachelor
12.	Other Department(s) Involved in Teaching the Course	Anatomy and histology /physiology and biochemistry /pathology/ pharmacology/internal medicine
13.	Learning Language	English
14.	Learning Types	☐Face to face learning ☒ Blended ☐Fully online
15.	Online Platforms(s)	☒Moodle ☒Microsoft Teams
16	Issuing Date	30/12/2023
17.	Revision Date	25-6-2025

18. Course Coordinator:

Name: Professor Mohammad AlSalem

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19. Other Instructors:

Name: **Prof. Yacoub Irshaid** Contact hours: 9-11 Sunday to Thursday

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20. Course Description:

A- Course Description:

The focus of this course is the detailed study of the endocrine tissue anatomy, histology, and origin. In addition, it discusses the contribution of endocrine systems to hormonal regulation of growth and development, reproduction, metabolism, and homeostasis. Finally, the course examines common clinical presentation and treatment of endocrine disease

B- Aims:

To provide students with stuffiest knowledge about the different endocrine glands in terms of their anatomical locations, their microscopic appearances, their organogenesis, their hormonal secretions and their function, the different diseases associated with each gland, the underlying biochemical processes involved in hormones, and the different pharmacological effect of different hormones; and the medications used to manage endocrine glands disorders.

21. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

PLO's	*National Qualifications Framework Descriptors*		
	Competency (C)	Skills (B)	Knowledge (A)
1.	☐	☐	☒
2.	☐	☒	☐
3.	☒	☐	☐
4.	☐	☐	☒
5.	☐	☒	☐
6.	☒	☐	☐
7.	☐	☐	☒
8.	☒	☐	☐

* Choose only one descriptor for each learning outcome of the program, whether knowledge, skill, or competency.

Program Intended Learning Outcomes (PLOs) (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program):

1. **Demonstrate basic knowledge of normal human structure and function at molecular, genetic, cellular, tissue, organ, system and whole-body levels in terms of growth, development, and health maintenance. Analyze the basic molecular and cellular mechanisms involved in the causation and treatment of human disease and their influence on clinical presentation and therapy.**

2. **Collect, interpret, document, and communicate accurately a comprehensive medical history, including the psychological and behavioral factors, and a thorough organ-system-specific physical examination inclusive of the mental status of the patient.**

3. **Integrate and communicate collected clinical information in the construction of appropriate diagnostic and therapeutic management strategies to identify life-threatening conditions ensuring prompt therapy, referral, and consultation with relevant disciplines and skillfully perform basic medical procedures for general practice on patients with common illness, acute and chronic, taking into account environmental, social, cultural and psychological factors.**

4. **Demonstrate in-depth knowledge of the epidemiology and biostatistics of common diseases, and analyze the impact of ethnicity, culture, socioeconomic factors and other social factors on health, disease and individual patient's health care.**

5. **Communicate effectively and professionally, both orally and in writing, with patients, their families, and with other healthcare providers utilizing information technology resources in his/her scholarly activities and professional development with the ability to teach others, and to understand and respect other healthcare professionals 'roles, and apply the principles of multidisciplinary teamwork dynamics and collaboration.**

6. **Apply scientific methods including evidence –based approach to the medical practice including problem identification, data collection, hypothesis formulation, etc., and apply inductive reasoning to problem solving and ensure that clinical reasoning and decision making are guided by sound ethical principles.**

7. **Demonstrate knowledge of scientific research methods and ethical principles of clinical research and be able to write research proposals or research papers.**

8. **Demonstrate professionally the skills needed for Quality improvement, lifelong learning, and continuous medical education including the ability to identify and address personal strength and weakness, self-assess knowledge and performance, and develop a self-improvement plan.**

22. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

Course ILOs #	The learning levels to be achieved						Competencies
	Remember	Understand	Apply	Analyse	Evaluate	Create	
1.	✓	✓					**Identify the location, blood supply, lymphatic drainage, innervation, development, and histological appearance of each gland.**
2.		✓	✓	✓	✓	✓	**Define and categorize the hormones secreted according to their biochemical structure**
3.		✓	✓	✓	✓	✓	**Describe factors stimulating and**

							inhibiting the secretion of each endocrine gland and describe the clinical manifestations of conditions resulting from hyper-and- hypo secretion of each endocrine gland
4.		✓	✓	✓	✓	✓	**Identify the histopathologic appearance of some diseases in endocrine glands, and the pharmacological preparations that stimulate or inhibit each endocrine gland**
5.		✓	✓	✓	✓	✓	**Infer from the sign and symptoms in some patients which hormones are involved, and which glands are affected**
.6		✓	✓	✓	✓	✓	**Decide on the possible pharmacological formulations that can be used in different hormonal imbalances**
.7		✓	✓	✓	✓	✓	**Correlate between certain complications in patients and**

							specific glandular diseases
.8		✓	✓	✓	✓		**Examine different H&E and special stained sections of different normal endocrine and have the ability to read them and differentiate between them**
.9		✓	✓	✓	✓		**Examine different histopathological sections and have the capacity to correlate it with the underlying disease**
.10		✓	✓	✓	✓		**Illustrate the general signs and symptoms related to endocrine diseases and value the major points in taking history, physical exam and laboratory investigations from patients with endocrine diseases**

23. The matrix linking the intended learning outcomes of the course -CLO's with the intended learning outcomes of the program -PLOs:

Program ILOs / ILOs of the course	CLO (1)	CLO (2)	CLO (3)	CLO (4)	CLO (5)	CLO (6)	CLO (7)	CLO (8)	CLO (9)	CLO (10)	Descriptors**		
PLO (1)	✓	✓	✓	✓	✓	✓	✓	✓	✓		A	B	C
PLO (2)										✓	✓		
PLO (3)												✓	
PLO (4)													✓
PLO (5)											✓		
PLO (6)												✓	
PLO (7)													✓
PLO (8)											✓		
													✓

***Linking each course learning outcome (CLO) to only one program outcome (PLO) as specified in the course matrix.**

****Descriptors are determined according to the program learning outcome (PLO) that was chosen and according to what was specified in the program learning outcomes matrix in clause (21).**

24. Topic Outline and Schedule:

Week (by subject)	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)**	Review differences between endocrine and exocrine glands. Review organogenesis of glands. List the endocrine glands. Describe the general structure of endocrine glands. Describe the connection and the role of hypothalamus in endocrine glands function.	K K K K S	Face to face		Synchronous Lecturing	Written exam	28.A,B , C
	1.2	**Anatomy/embryology/Histology** **(Pituitary gland)**	Identify the location, relation, blood, lymphatic drainage, nerve supply of pituitary gland. Know the organogenesis of pituitary gland. Describe the structure of pituitary glands and its relation to hypothalamus. Describe the histological appearance of the different parts of pituitary glands and their cellular composition. Identify the hypothalamic-hypophyseal tract and portal circulation Identify the possible complications in anatomical relations as a result of pituitary diseases.	K K K K K S	Face to face		Synchronous Lecturing	Written exam	28.A,B , C

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

			Differentiate between the endocrine and exocrine portions of the pancreas. Identify the microscopic appearance of islets of Langerhans and the different cell subpopulations. Identify the microscopic appearance of pineal glands, and differentiate between secretory cells and glial cells.	K S					
	1.7	**Histology lab**	Examine a set of microscopic slides for glands using light microscopic images/ virtual microscopy laboratory. Discussion.	S	Blended		Synchronous Lecturing	Written exam	28.A,B , C
	1.8	**Histology lab**	Examine a set of microscopic slides for glands using light microscopic images/ virtual microscopy laboratory. Discussion.	S	Blended		Synchronous Lecturing	Written exam	28.A,B , C
2	2.1	**Physiology** Hypothalamic-pituitary relationship	Describe adeno and neurohypophyseal hormone actions. Describe the regulation of anterior pituitary hormones by the hypothalamus. Describe the posterior pituitary gland relationship with the hypothalamus.	K K K	Face to face		Synchronous Lecturing	Written exam	**28.A**
	2.2	**Physiology** Adenohypohyseal hormones	Describe growth and metabolic effects of growth hormone. List the principal insulin-like growth factors and describe their relationship to the actions of growth hormone. Describe the regulation of growth hormone secretion. Describe the role of the hypothalamus, growth hormone releasing hormone and somatostatin in the control of growth hormone secretion.	K K K K	Face to face		Synchronous Lecturing	Written exam	**28.A**
	2.3	**Physiology** Posterior pituitary hormones	Discuss the physiological effects of antidiuretic hormone.	K	Face to face	Moodle	Asynchronous Lecturing	Written exam	**28.A**

			Describe the regulation of antidiuretic hormone secretion. List the major physiological effects of oxytocin. Describe the regulation of oxytocin secretion.	K K K					
	2.4	**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**
	2.5	**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**
	2.6	**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**
	2.7	**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	Blended		Synchronous Lecturing	Written exam	**28.A**

			List the catecholamines secreted by the adrenal medulla. Describe the actions of catecholamines in human body. List the factors that regulate adrenal medullary secretion.	K K K					
	2.8	**Physiology** Glucocorticoids Sexual function of the male and female	Describe the major physiological effects of glucocorticoids. Discuss the regulation of cortisol secretion. Describe the clinical consequences of hypo- and hyperadrenalism. Describe the testicular function, spermatogonia and male hormonal patterns. Characterize the ovarian function. Understand the hormonal patterns of the menstrual cycle. Review the control of hormonal patterns in the female.	K K K K K K	Blended	Moodle	Synchronous Lecturing	Written exam	**28.A**
	3.1	**Biochemistry** Introduction to biochemical endocrinology	Understand nature of hormones and describe hormone biosynthesis, secretion and transport. Understand targeting delivery and response of hormones. Understand hormonal interactions (systemic, cellular, synergistic and inhibitory). Understand regulation of hormone secretion and feedback mechanisms.	K K K K	Face to face		Synchronous Lecturing	Written exam	**28.A**
	3.2	**Biochemistry** **(**Mechanism of hormone actions I)	Understand G-protein coupled receptors: components (receptor, transducer, amplifier and intracellular messenger) and amplifier mechanisms (cAMP, phosphoinositoldiphosphate (PIP2) and ion channels). Understand PIP2 turnover (Ca+2/protein kinase C systems).	K K	Face to face		Synchronous Lecturing	Written exam	**28.A**

			Describe Ca+2 homeostasis and actions of inositoltriphosphate (IP3). List actions of diacylglycerol (DAG). List hormones that act through PIP2 turnover.	K K					
	3.3	**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 K	Blended	Moodle	Synchronous Lecturing	Written exam	**28.A**
	3.4	**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**
4	4.1	**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**
	4.2	**Pharmacology** Pharmacology of hypothalamic and	Describe the pharmacology of hypothalamic hormones CRH, TRH, GHRH, GHIH, and dopamine.	K	Face to face	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					
	4.3	**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**
	4.4	**Pharmacology** Pharmacology of parathyroid gland I	Understand the pharmacology of parathyroid hormone and its major antagonists.	K	Face to face		Synchronous Lecturing	Written exam	**28.A**
	4.5	Pharmacology of parathyroid gland II	Vitamin D and Osteoporosis	K	Face to face		Synchronous Lecturing	Written exam	**28.A**
	4.6	**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	Face to face	Moodle	Asynchronous Lecturing	Written exam	**28.A**
	4.7	**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	Blended		Synchronous Lecturing	Written exam	**28.A**
	4.8	**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**
	4.9	**Pharmacology** Pharmacology of pancreatic hormones	Understand the pharmacology of different classes to oral hypoglycemic agents	K	Blended		Synchronous Lecturing	Written exam	**28.A**
5	5.1	**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**
	5.2	**Pathology** Neoplastic thyroid diseases	List types of thyroid tumors	K S S	Face to face		Asynchronous Lecturing	Written exam	**28.A**

			Appraise genetic mutations in various types of thyroid tumors Compare papillary and follicular carcinomas						
	5.3	**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**
	5.4	**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**
	5.5	**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**
	5.6	**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**
	5.7	**Pathology lab**	Appraise the histopathological changes of common thyroid diseases. Appraise the histopathological changes of common thyroid diseases.	S	Blended	Moodle	Synchronous Lecturing	Written exam	**28.A**
6	6.1	**Internal medicine**	Diabetes	K	Face to face	Moodle	Synchronous Lecturing	Written exam	
	6.2	**Internal medicine**	General endocrinology	K	Blended	Moodle	Synchronous Lecturing	Written exam	
	6.3	**Revision**							
	6.4	**Final exam**							

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

25. Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	CLOs	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	3rd week	Paper-based exam
Final exam	60	Subjects covered in biochemistry, pathology, and pharmacology and internal medicine.	2.4-3.8	K S C	8th week	Paper-based exam
** K: Knowledge, S: Skills, C: Competency						

*** According to the instructions for granting a Bachelor's degree.**

****According to the principles of organizing semester work, tests, examinations, and grades for the bachelor's degree.**

(Tables below are completed on separate forms by course coordinators prior to conduction of each exam according to Accreditation and Quality Assurance Centre procedures and forms)

Mid-term exam specifications table*

No. of questions/ cognitive level						No. of questions per CLO	Total exam mark	Total no. of questions	CLO/ Weight	CLO no.
Create **%10**	Evaluate **%10**	analyse **%10**	Apply %20	Understand **%20**	Remember %30					
1	1	1	4	2	1	10	100	100	10%	1

Final exam specifications table

No. of questions/ cognitive level						No. of questions per CLO	Total exam mark	Total no. of questions	CLO Weight	CLO no.
Create **%10**	Evaluate **%10**	analyse **%10**	Apply %20	Understand **%20**	Remember %30					
										1
										2
										3
										4
										5

26. Course Requirements:

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

Histology Lab

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

https://v15.proteinatlas.org/learn/dictionary/normal

1. https://www.uptodate.com/
2. MEDLINE Home (nih.gov)

PubMed (nih.gov)

Name of the Instructor or the Course Coordinator: Professor Mohammad Alsalem	Signature: ……..……	Date: ……..……
Name of the Head of Quality Assurance Committee/ Department Dr.Enas Al-Zayadneh.	Signature: ……..……	Date: ……..……
Name of the Head of Quality Assurance Committee/ School or Center Professor Ayman Wahbeh	Signature: ……..……	Date: ……..……
Name of the Dean or the Director Professor Ayman Wahbeh	Signature ……..……	Date: ……..……