

MODULE DESCRIPTION

وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Biology		Module Delivery	
Module Type			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code				
ECTS Credits				
SWL (hr/sem)	75			
Module Level	1	Semester of Delivery		1
Administering Department	Radiology	College	Health and Medical Technologies	
Module Leader	Abdullah Hammood Abdullah		e-mail	abdullah.hammood.abdullah@sa-uc.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	M.Sc.	
Module Tutor	Abdullah Hammood Abdullah		e-mail	abdullah.hammood.abdullah@sa-uc.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	2026-2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Provide a fundamental understanding of cell structures, cellular division (mitosis/meiosis), and metabolism. 2. Teach DNA structure, replication, transcription, which are crucial for understanding molecular imaging and genetic predispositions to diseases. 3. Correlate cellular structures with macroscopic anatomy to help students recognize normal versus pathological tissues on medical scans. 4. To teach students how ionizing radiation interacts with human cells and DNA. This includes learning how to minimize cellular damage and applying critical safety protocols. 5. To build a foundational understanding of the human body that aids in explaining procedures, ensuring patient compliance, and understanding the biological implications of contrast media use. 6. To connect basic anatomy and physiology to how normal and pathological tissues appear across various modalities. 7. To equip students with the ability to use mathematical or kinetic models to calculate cell survival curves during radiation therapy.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Describe the components, functions, and interactions of cellular organelles. 2. Explain the principles of DNA replication, transcription, translation, and gene regulation. 3. Identify the stages of mitosis and meiosis and their role in growth and inheritance. 4. Recognize and differentiate the four primary tissue types. 5. Relate the cellular structure of human organs to their physiological functions. 6. Execute standard medical biology laboratory techniques, e.g., microscopy and cell culturing. 7. Analyze, interpret, and present experimental data using statistical and graphical methods. 8. Communicate complex biological and medical concepts clearly through written reports and oral presentations.
Indicative Contents المحتويات الإرشادية	1. Structure and classification of basic human tissues (epithelial, connective, muscular, and nervous). 2. Cell structure, organelle functions, bio membranes, transport mechanisms, cell cycle control, and cell division. 3. DNA replication, transcription, translation, chromosome structure, and mutation. 4. Prokaryotic cell structures, host-pathogen interactions, basic immunology, and common infectious diseases. 5. Molecular diagnostics, and the biological basis of diseases like cancer.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Effective medical biology teaching requires shifting from rote memorization to active, student-centered learning. By integrating case studies, problem-based exercises, and digital simulations, educators can bridge foundational science with clinical application, preparing students for complex healthcare environments.

- Simulations and Virtual Labs
- Team-Based Learning
- Flipped Classroom
- Case-Based Learning
- 3D Molecular Modeling
- Peer Teaching
- Objective Structured Clinical Examinations
- Integrated Concept Questions

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Biology What is Biology The qualities of constitutive life History and General Concept of Biology Cell Theory
Week 2	Chemical Composition of the Cell Inorganic and Organic molecules
Week 3	Biologically Important Molecules Structure, function, and medical importance of Carbohydrates, Lipids, Proteins, Nucleic Acids
Week 4	Plasma Membrane: Molecular Organization, Lipid bilayer, Fluid mosaic model, Mechanism of transport
Week 5	Cytoplasm Cytoskeleton – Microtubules, Microfilaments, Intermediate filaments
Week 6	Cytoplasmic Organelles Endoplasmic Reticulum, Ribosomes
Week 7	Mitochondria, Lysosomes
Week 8	Golgi Apparatus
Week 9	Mid-Exam
Week 10	The Nucleus: Nuclear envelope, Chromatin, The Nucleolus
Week 11	Chromosome Structures Translocation, Deletion, Duplication, Inversion
Week 12	DNA structure, Replication, Transcription, Translation
Week 13	Introduction to Cell Division: The Cell Cycle, Interphase, Mitosis
Week 14	Meiosis Prokaryotic Cell Division
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Laboratory Safety, PPE
Week 2	The Light Microscope, Parts and proper focusing techniques
Week 3	Observation of Prokaryotic cells using prepared microscope slides
Week 4	Observation of Eukaryotic cells using prepared microscope slides
Week 5	Observation of Cell Division Phases Mitosis: Onion tips or Animal cells

Week 6	Identification of different stages of meiosis using microscopic slides
Week 7	Identification of normal epithelial tissues under the microscope
Week 8	Mid-Exam
Week 9	Identifying connective, muscular and nervous tissue
Week 10	Studying cellular organelles and structural components
Week 11	Use of potato strips to observe osmosis
Week 12	Demonstration of cell membrane transport Using vinegar for dissolving egg shell
Week 13	DNA extraction Basic demonstration of extracting DNA from plant cells (Banana)
Week 14	Biological indicators of radiation exposure Demonstration (case analysis of chromosome aberrations)
Week 15	The Cell Cycle steps and positions of Checkpoints
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. V. I. Bekish, Yu. T. Nikulin (2006). Practical Book on Medical Biology. 2. Peter Raven (2016). Biology, Eleventh Edition.	
Recommended Texts	Elizabeth O. Grady, Jason Cashmore, Marsha, Carol Wiseman (2018). <i>Principles of Biology: An Introduction to Biological Concepts</i> , Second Edition.	
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جداً	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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