

CYTOLOGY DESCRIPTION FORM

نموذج وصف علم الخلية

Module Information			
معلومات المادة الدراسية			
Module Title	Cell Biology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	UOMU038021		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	Forensic Science	College	College of Science
Module Leader	Dr. Imad Hadi Hameed	e-mail	
Module Leader's Acad. Title	Asst. Professors	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Imad Hadi Hameed	e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date		Version Number	

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	Module aims - intentions of the module This module aims to develop an advanced understanding of cell biology. It will address the major processes that occur within cells, including: principles of cell signalling, regulation of cell shape, cell division, apoptosis and the functions of the endomembrane system.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles 2. Students will understand how these cellular components are used to generate and utilize energy in cells 3. Students will understand the cellular components underlying mitotic cell division. 4. Students will apply their knowledge of cell biology to selected examples of changes or losses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation.
Indicative Contents المحتويات الإرشادية	<p>Tier 1- All cell biology sections will cover the following topics</p> <p>Understand the basic components of prokaryotic and eukaryotic cells</p> <p>The cell doctrine</p> <p>Chemistry of molecules:</p> <p>Covalent and hydrogen bonds</p> <p>Water and polarity: hydrophilic vs. hydrophobic</p>

Organic molecules, functional groups

Polymer macromolecules

Monomers and polymers

Monosaccharides and carbohydrates

Nucleotides and nucleic acids

Nucleotides, sugar-phosphate backbone

Amino acids and proteins

Peptide bonds

Side-chains

1o-4o structure

Membranes

Lipids, bilayers

Chemical evolution: micelles into cells

M Pores and pumps: facilitated diffusion, active transport, cotransport

Organelles

Prokaryotes vs. eukaryotes

Nucleusembrane proteins, fluid mosaic mode

Understand how energy is used and generated in cells

ATP and its uses

Respiration

Electron carriers

Roles of enzymes

Glycolysis

Krebs

Oxidative phosphorylation

Cellular level: cell cycle and cell division

1. The key roles of mitosis and meiosis during the life cycle.

Compare and contrast different life

cycle strategies, focusing on the human life cycle.

2. Stages of mitosis and meiosis, highlighting similarities and differences. Describe stages of the

cell cycle; focus on behavior of chromosomes.

3. Origins of genetic variation, including independent assortment and crossing over, which happen

during meiosis, combined with random fertilization.

Rules of heredity at the level of an organism

1. Laws of segregation and independent assortment; their physical basis in specific events that take

place during meiosis (gametogenesis) and fertilization

	<p>2. Practical methodology for applying Mendelian laws (heavily reliant on problem solving)</p> <p>3. Extensions of Mendelian genetics, including different forms of allelic relationships</p> <p>4. Inheritance of linked genes, including recombination mapping, and the physical basis of these rules (chromosomal behavior during meiosis)</p> <p>5. Special case of linkage: sex-linked genes and their inheritance, including X-inactivation.</p> <p>6. Applications of the above to human heredity (eg. hereditary disease)</p> <p>Molecular level</p> <p>1. DNA as the genetic material; basic mechanism of DNA replication</p> <p>2. RNA and the basic mechanism of transcription</p> <p>3. Protein and the basic mechanism of translation</p> <p>4. Mutations as an additional source of genetic variation; a role for mutations in disease</p> <p>Genome level</p> <p>1. Genomic diversity: general features of viruses, bacteria, and eukaryotes</p> <p>2. Regulation of gene expression: bacteria vs eukaryotes</p> <p>3. Eukaryotic genomes: “junk” DNA, coding vs non-coding genes</p>
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<p>Learning and Teaching Strategies</p> <p>استراتيجيات التعلم والتعليم</p>	
<p>Strategies</p>	<p>Type something like: The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.</p>

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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	5% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	15% (10)	Continuou s	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 and basic principle of cell biology
Week 2	Protein Structure and Function

Week 3	Polymer macromolecules
Week 4	Tissue: Structure, properties; classification and function(pat1)
Week 5	Tissue: Structure, properties; classification and function(part2)
Week 6	Cellular level: cell cycle and cell division
Week 7	Molecular level : DNA as the genetic material; basic mechanism of DNA replication Mutations as an additional source of genetic variation; a role for mutations in disease)
Week 8	Mid exam
Week 9	RNA and the basic mechanism of transcription
Week 10	Protein and the basic mechanism of translation & Mutations as an additional source of genetic variation; a role for mutations in disease)
Week 11	Genome level
Week 12	Genomic diversity: general features of viruses, bacteria, and eukaryotes
Week 13	Regulation of gene expression: bacteria vs eukaryotes
Week 14	Eukaryotic genomes: “junk” DNA, coding vs non-coding genes
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Laboratory safety roles
Week 2	Types of microscopes and Parts of the Microscope
Week 3	Gel electrophoresis of pre-digested DNA
Week 4	Basic cell culture techniques
Week 5	Water, Acids, Bases and pH Enzymes in Living Tissues
Week 6	Mid exam
Week 7	DNA The Foundation of Life)
Week 8	DNA Extraction and Gel Electrophoresis
Week 9	The Cell Cycle & Mitosis, Patterns of Inheritance
Week 10	Plasmid analysis; DNA fingerprinting using PCR
Week 11	Determine hematocrit from a blood sample image.
Week 12	Explain the ABO and Rh blood groups and their clinical significance.
Week 13	identify and describe all formed elements in a human blood smear.

Week 14	Cell fractionation
Week 15	Second Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Reference book: Bruce Alberts Karen Hopkin Alexander D. Johnson David Morgan Martin Raff , Essential Cell Biology	No (Available as an e-book)
Recommended Texts		
Websites	From Wikipedia, the free encyclopedia	