



Course Syllabus of Molecular Biology and Genetics

Faculty: Medicine and Health Sciences
Department: Health Sciences
Program: Bachelor in Medical Laboratory

I. General information about the course instructor:

Name	Prof. Salih Abdu. Al-Sharaby	Office Hours(3 Hours Weekly)					
Location & phone number	774492327	Sat	Sun	Mon	Tue	Wed	Thu
Email	Salih.abdu7@gmail.com	1	-	1	-	-	1

II. General information about the course :

1. Course Title:	Molecular Biology and Genetics				
2. Course Code and Number :	BML241				
3. Credit Hours	Lecture	Seminar/Tutorial	Practical	Training	Total
	2				2
4. Study Level and Semester:	2 nd Year /2 nd Semester				
5. Pre-requisites :	BHS120 - BML235				
6. Co-requisites :	None				
7. Program in which the course is offered	Bachelor in Medical Laboratory				
8. Teaching Language:	English				
9. Instruction location:	University of Science and Technology, Sana'a ,Yemen				

III. Course Description :

Molecular Biology is a course organized around the Central Dogma of Biology with presentations covering fundamental aspects of DNA and RNA structure, their function and their interactions with proteins. The course opens with a discussion of the physical and chemical properties that drive the interactions of proteins with nucleic acids. This is used as a basis for understanding the material presented in the subsequent five modules, which cover DNA replication, DNA repair, gene regulation, transcription and translation. The course carried out using lectures, self-learning, seminar, discussion and brainstorming. Evaluation will be done via periodic oral, written presentations, reports and final written exam. Biochemistry I and biology courses are prerequisites.

عميد الكلية:
د. عبد الله المخلافي

رئيس القسم:
د. عبد الكريم القباطي

البريد الإلكتروني
13/8

المراجع:
د. طلال الفحطاني
د. مجاهد نصار

الموصف:
د. صالح الشرعبي

IV. Course Aims: This course is aimed to

- 1- Provide an opportunity for the student to distinguish the molecular basis of cellular processes and interrelationships in living systems with an emphasis on eukaryotic systems;
- 2- Teach the student the introductory “language” and “dictionary” of molecular cell biology;
- 3- Enhance fundamental insights for the student to initiate and further develop the process of inquiry-based learning and discovery in science;
- 4- Establish the basic skills to allow the student to explore and assess their interests in the fields of molecular and cellular sciences for career opportunities;
- 5- Provide the student with fundamental knowledge to facilitate the systematic process of problem solving in molecular and cell biology.

V. Course Intended Learning Outcomes (CILOs): After finishing this course the student will be able to:

After completion of this course student should be able to:

1. Define medical terms and language related to molecular cell biology.
2. Explain how the study of cell molecular biology has resulted in medical advances.
3. Recognize the genetic information flow; including nucleic acid structures, the definition of a gene, the organization of the genome, the replication, the formation of RNA (transcription), the processing of pre mRNA and the protein synthesis (translation)
4. Describe the emerging information and technologies used in identifying the genetic diseases.
5. Correlate the molecular basis of genes with genetic diseases
6. Develop the necessary analytical skills to understand the nature of genetic diseases and inheritance through addressing the right questions and concerns.
7. Read and evaluate results related to genes and genetic diseases and suggest the appropriate gene therapy.
8. Cooperate with supervisors, colleagues and preserve the privacy of patients in medical centers and hospitals.

VI. Course Contents

Theoretical Aspect:

No.	Course Units	Sub-topics	Week due	Contact Hours
1	An Introduction to Molecular Biology	<ul style="list-style-type: none">- Definition- Related disciplines- The fundamental principles of heredity- Chromosomes- Genes- Human Genome		2
2	Overview of the cell	<ul style="list-style-type: none">- Cell chemistry- Cell communications- Cell cycle	1	2
3	Structure of DNA	<ul style="list-style-type: none">- DNA and RNA	1	2

4	DNA replication	Requirements Unwinding Initiation Elongation Termination Eukaryotic and prokaryotic	2	4
5	DNA transcription	DNA into RNA Initiation Elongation Termination	1	2
6	DNA Translation and Gene Expression	Initiation Elongation Termination Genetic code Requirements(Enzymes Protein, mRNA ,t RNA)	1	2
7	Midterm Exam		1	2
	Repair Mutation	Types Mechanism	2	4
8	Gene regulation	Modification of DNA Regulation of transcription RNA processing Translation control RNA degradation Protein degradation	1	2
9	PCR	Definition Denaturation Annealing Elongation PCR Application	1	2
10	DNA extraction	Definition Types Purification	1	2
	Electrophoresis	Definition Components		
11	Molecular techniques	- Restriction enzyme - Blotting - Recombinant DNA - DNA sequencing	1	2
12	Final Exam		1	2
Total number of weeks and hours			15	30

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