

Course syllabus of Advanced Molecular Biology

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

I. General information about the course instructor:							
Name	Dr.Talal alqahtani	Office Hours					
Location & phone number	Sana'a 776005164	Sat	Sun	Mon	Tue	Wed	Thu
Email	Alqahtani.talal@yahoo.com	-	1	1	1	-	-

II. General information about the course:						
1. Course Title:	Advanced Molecular Biology					
2. Course Code and Number :	BMLL05					
3. Credit Hours :	Lecture	Seminar/Tutorial	Practical	Training	Total	
	2	-	-	-	2	
4. Study Level and Semester:	Elective					
5. Pre-requisites:	None					
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
<p>Students who successfully complete this course will acquire in depth understanding and advanced knowledge of a range of general and specialized areas in cell and molecular biology. They will develop insight into the complexities of cell structure and function, the molecular controls that govern the cells' dynamic properties, and cellular interactions with the organism as a whole. And insight to the important techniques of Molecular Biology. The course is based on lectures as well as seminars, group discussion, group works, collaborative learning, and self-study. The students will be evaluated through written exam, short essay, problems and evaluation of log book. Molecular Biology and genetics is a prerequisite course.</p>

عميد الكلية:
د. عبد الله المخلافي

رئيس القسم:
د. عبد الحبيب القباطي

المراجع:
د. ابراهيم السبل

الموصف:
د. طلال القحطاني

مجلس ضمان الجودة والاعتماد
مُعْتَمَد
APPROVED

IV. Course Aims: This course is aimed to:

- 1- Enable the student to outline the Central Dogma of genetic found in all living organisms.
- 2- Introduce the student into the world of advance Molecular Biology to understand the transfer of genetic information from nucleic acid till protein synthesis and cell function.
- 3- Provide students with an advanced knowledge to explain the Chromosome and gene structure genetic diseases.
- 4- Improve the skills of the students to generate a hypothesis from a set of observations and then design experiments to test the hypothesis.
- 5- Teach to student the bases of basic research in molecular techniques and cellular biology, and help them reaching the correct conclusions from their experimental results..

V. Course Intended Learning Outcomes (CILOs):

- 1- Discuss the Genetic Central dogma including the Replication, Transcription and Translation.
- 2- Explain the basis of gene and Chromosome structure.
- 3- List the steps of Extraction and Purification of Genetic Material .
- 4- Outline data related to genetic disease and cancer.
- 5- Analyze emerging information and technologies in identifying the genetic diseases.
- 6- Interpret data of DNA ,RNA and Biomarkers related to targeted disease and cancer.
- 7- Apply the genetics technique to identify genetic diseases and to distinguish patterns of inheritance for single gene disorders linked to autosomes, sex chromosomes, and the other .
- 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	Central Dogma	- Replication (revision) - Transcription(revision) - Translation(revision)	1 st	2
2	Chromosome and gene structure	- Chromosome structure - Gene Structure - Functions - Related readings	2 nd	2
3	DNA Extraction & Purification	- Methods of Extraction - Purification of DNA, RNA, Phenol and protein	3 rd	2
4	Genes and Cancer	- Oncogenes - Proto-oncogenes - Human Genome - Epigenetics	4 th	2
5	Genetic Diseases	- Genetic Diseases - Diagnosis	5 th	2

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الموصف :
د طلال القحطاني

6	Recombinant DNA technologies	<ul style="list-style-type: none"> - DNA cloning Factor - Genomic& cDNA Libraries - In vitro Mutagenesis 	6 th	2
7	Midterm Exam		7 th	2
8	DNA analysis	<ul style="list-style-type: none"> - Molecular Hybridization - DNA Labeling - Quantitative (Real time PCR) - Sanger sequencing 	8 th	2
9	RNA analysis	RT-PCR and Race RNA Labeling, Northern blotting and Insitu hybridization RNase protection assays	9 th	2
10	Genome Wide DNA & RNA analysis	<ul style="list-style-type: none"> - Microarray - Next generation Sequencing RNA sequencing & Chip Sequencing - 	10 th	2
11	Identification of Biomarkers & Molecular Diagnosis	<ul style="list-style-type: none"> - DNA polymorphism - Technologies & Strategies for molecular biomarker discovery 	11 th	2
12	Gene therapy	Assigned topics	12 th	2
13	Transgenic and gene target	Assigned topics	13 th	2
14	Revision		14 th	2
15	Final Exam		15 th	2
Total number of weeks and hours			15	30



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