

## Planning and Quality Assurance Affairs

Form (A)

### Course Specifications

#### General Information

Course name	Molecular Biology
Course number	MEDI3202
Faculty	
Department	
Course type	College Needs
Course level	3
Credit hours (theoretical)	2
Credit hours (practical)	0
Course Prerequisites	

#### Course Objectives

- 1 - By the end of the course, students should be able: To describe the general principles of the genetic material and how it compacted and organized into chromosomes in viruses, prokaryotes and eukaryotes. To explain the structure and function of nucleic acids as well as to compare and contrast their biological processes and mechanisms such as replication, transcription, translation and protein synthesis in prokaryotic and eukaryotic organisms. To distinguish between the different molecular biology methods and techniques and to Interpret the outcome of investigations that include the use of traditional and modern recombinant DNA technology of gene analysis.

#### Intended Learning Outcomes

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| Knowledge and Understanding | * Medical students demonstrate essential knowledge and understanding of molecular biology and recombinant DNA technology. Medical student learn specific techniques and applications that used in medical researches |
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#### Course Contents

- 1 - The molecular nature of the genetic material Identification of nucleic acids as the genetic material: experimentation and evidences Structure and functions of nucleic acids DNA & RNA Chromosome organization and molecular structure in prokaryotes and eukaryotes DNA replication and repair The flow of genetic information: transcription and translation Recombinant DNA technology Restriction endonucleases DNA cloning Restriction maps Nucleic acid hybridization The polymerase chain reaction (PCR) Techniques for analysis of DNA sequences DNA polymorphisms Single-nucleotide polymorphisms (SNPs) Restriction fragment length polymorphisms (RFLPs) Random amplified polymorphic DNA (RAPD) DNA sequencing In situ hybridization DNA footprinting Mutagenesis Transgenic animals Monoplex and multiplex PCR Short tandem repeat (STR) polymorphism Amplified fragment length polymorphisms (AFLPs) Real-time polymerase chain reaction (qPCR).

#### Teaching and Learning Methods

- 1 - PowerPoint and whiteboard for more explanations

#### Teaching and Learning Methods for the Disabled Students

- 1 - Will be treated and addressed individually according to the type of disability

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**Students Assessment**

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
First hour Exam	60 Min	20
Second hour Exam	60 Min	20
participation, attendance		10
Final Exam	120	50

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**Books and References**

Course note	Lewins GENES XI
Recommended books	Molecular Cell Biology (Lodish, Molecular Cell Biology) Molecular Biology of the Cell, Bruce Alberts et al.,