

نموذج وصف المقرر

Review the performance of the higher education institution
((review of the academic program))

وصف المقرر

This course description provides a summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, proving whether he has made the most of the available learning opportunities and must be linked to the program description.

1. Educational Institution	Al-Zahrawi University College - Ministry of Higher Education and Scientific Research
2. University Department / Center	Medical Laboratory Techniques
3. Course Name / Code	Molecular Biology / Theoretical
4. Programs in which it is included	Included in laboratory presence and classroom lectures
5. Available Forms of Attendance	Classroom and lab presence
6. Semester / Year	First Semester, 2024-2025
7. Total Number of Study Hours	٣٠ hours
8. Date of preparing this description	January 1, 2025
9. Course Objectives:	<ul style="list-style-type: none">• Train students theoretically, practically, and applicably on the basics of molecular biology, especially in the medical context.• Transfer the latest scientific techniques to enrich students in molecular biology and its applications in medical technology.• Introduce students to the molecular structure of somatic cells to prepare them for future professional practice.

1. Learning Outcomes, Teaching and Learning Methods, and Evaluation

A. Knowledge and Understanding

Cognitive Goals:

1. Understand the molecular structure of DNA and RNA.
2. Explain experimental evidence supporting the function of genetic nucleic acids.
3. Clarify genes and proteins.
4. Understand the environment of nucleic acids and their functional relationships, including:
 - DNA cloning
 - Base pairing and stacking
 - Antiparallel helices
 - Gene extraction
 - Genetic code
5. Know the types of ribonucleic acids (RNA).
6. Understand RNA polymerization.
7. Understand RNA processing.
8. Understand gene transformation mechanisms.

B. Subject-Specific Skills

- Prepare and describe nucleic acid slides and compare them.
- Use comparative methods to describe genetic traits and diseases.
- Apply scientific techniques to detect human diseases.
- Understand the role of structural and functional factors in describing diseases.

Teaching and Learning Methods

- Lectures, visual aids, and laboratory sessions.

Assessment Methods:

1. Quizzes
2. Monthly exams
3. Midterm and final exams
4. Attendance, participation, and appropriate behavior

C. Evaluation Methods

- Identify molecular structures of nucleic acids and relate them to human traits, diseases, and abnormalities.
- Provide technical consultations related to human diseases.
- Evaluate the legitimacy of using scientific techniques to address genetic structural defects in humans.

D. Thinking Skills

- Technological skills for identifying nucleic acid differences
- Skills to detect diseases and abnormalities based on nucleic acid differences
- Medical consultation skills

Teaching and Learning Methods

- **Utilizing modern educational models in teaching.**
- **Allocating a portion of the grade for activities and participation.**
- **Managing the lecture in a way that makes students value the importance of time.**

Evaluation Methods

- Through dialogue and discussion.

e. General and Transferable Skills

- Technical skill in identifying differences between nucleic acids.
- Skill in detecting diseases and abnormalities through nucleic acid variations.
- Skill in providing medical consultation.

11.Course Structure

Weeks	Hours	Required Learning Outcomes	Unit Name / Course or Topic	Learning Methods	Evaluation Method
1	2	Identify molecular biology	Introduction to Molecular Biology applications in Medical Laboratory Techniques	Lecture & explanation	Quiz
2-4	٦	Understand structure	DNA and RNA structure	Lecture & explanation	Quiz
5	2	Understand replication	DNA replication and models	Lecture & explanation	Quiz
6	2	Understand transcription	DNA transcription & post-transcription modifications	Lecture & explanation	Quiz
7	2	Understand translation	Translation, post-translation modifications, protein synthesis	Lecture & explanation	Quiz
8	2	Understand expression	Gene expression and genetic code	Lecture & explanation	Quiz
9	2	Understand repair	DNA damage and repair mechanisms	Lecture & explanation	Quiz
10-12	٦	Understand mutations	DNA mutations and chromosomal abnormalities	Lecture & explanation	Quiz
13	2	Understand apoptosis	Programmed cell death, telomeres, telomerase, cancer	Lecture & explanation	Quiz
14-15	٤	Understand recombinant DNA	Recombinant DNA tech: Restriction enzymes, vectors, molecular cloning applications	Lecture & explanation	Quiz

12. Infrastructure	
Required Readings:	References: <ul style="list-style-type: none"> • Clug, Cummings & Spencer (2006, 2014) – Genetic Concepts • Strachan & Reed (2004) – Molecular Human Genetics • American Journal of Human Genetics
Special Requirements (Workshops, Journals, Software, Websites):	Electronic Websites: <ul style="list-style-type: none"> • MBCI • OMIM
Social Services (Guest Lectures, Professional Training, Field Studies, Others)	Organizing workshops and courses for graduates:

13.	
Prerequisites	
Minimum Number of Students	100
Maximum Number of Students	160



Name of the Instructor: Dr. Haider Fadhil Jawad