



Course Specification

— (Postgraduate Programs) عبدالمحسن

Course Title: Methods in Biochemistry

Course Code: BIO-6112 (Lab Course)

Program: Master of Science in Applied Biology (Cell and Molecular Biology)

Department: Biology عبدالمحسن

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.

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عبد المحسن بن أحمد العزيمي عبد الله بن محمد بن الناصر

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2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100%
2	E-learning	-	-
3	Hybrid - Traditional classroom - E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	15
2.	Laboratory/Studio	30
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
	Total	45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.1	Outline the principles of UV-Visible, spectroscopy, and applications of fluorescence spectroscopy.	K1	-Lab Presentations and group discussions to introduce the biochemical analytical techniques	-Active participation in lab discussions. -Lab reports -lab exam
1.2	List the separation techniques including centrifugation, electrophoresis and chromatography.	K2	-Lab Presentations and group discussions to introduce the biochemical analytical techniques	-Active participation in lab discussions. -Lab reports -Lab exam
1.3	Explain the significance of various types of immunological methods and their applications.	K3	-Lab Presentations and group discussions to introduce the biochemical analytical techniques	-Active participation in lab discussions. -Lab reports -Lab exam
2.0	Skills			
2.1	Apply the biochemical methods and techniques professionally to support the various research purposes	S1	-Guided Lab work -Lab tutorials	-Active participation in lab discussions. -Lab reports -Lab exam
2.2	Design and conduct experimental research work by employing critical practical skills to address specific biochemical issues.	S2	-Guided lab experiments -Group discussions	-Lab reports -Presentations
2.3	Interpret, evaluate and analyze the experimental	S3	-Guided analysis of research data	-Lab reports -Presentations

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	data using the appropriate statistical methods, and draw meaningful conclusions.		-Group discussions	
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate independence in performing the research work, and cooperate effectively in a team.	V1	-Guided lab research work – Group discussions	-Lab reports -Presentations by research groups
3.2	Participate in discussion of scientific issues and present the research results professionally either orally or in a written format.	V2	-Tutorials on presenting research data -Seminars -Group discussions	-Presentations -Lab reports
3.3	Adhere to the relevant ethical rules while performing research work in biochemistry	V3	-Tutorials on research ethics	-Lab reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction to Biochemical Methods: Overview of the course objectives, structure, and importance of analytical techniques in biology.	2
2.	Spectroscopy-I: Principles of molecular absorption, optical density, and applications of visible and UV absorption in protein quantification.	4
3.	Spectroscopy-II: Principles of fluorescence, fluorescence spectroscopy, and types of fluorophores.	4
4.	Centrifugation:	2



	Theory and principles of Centrifugation, types of centrifugation techniques, and applications of centrifugation techniques in cellular fractionation and biomolecule separation.	
5.	Electrophoresis Techniques-I: Tools of electrophoresis, types of electrophoresis, and visualization of gel.	2
6	Electrophoresis Techniques-II: Polyacrylamide Gel Electrophoresis (PAGE), PAGE Tools, and SDS-PAGE.	2
7.	Chromatography: General principles of chromatography, different types of chromatography, and applications in biomolecule separation.	2
8.	Immunological Methods-I: Introduction to immunological methods, overview of antigen-antibody interactions, and ELISA techniques.	4
9.	Immunological Methods-II: Western blotting: Principles and application of Western blotting.	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exams	5 th and 10 th weeks	30 %
2.	Quizzes, presentations, lab reports, participation, attendance, data search, assignments	Throughout the semester duration	30 %
4	Final lab exam	15 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:



Essential References	Wilson, K., & Walker, J. (2018). Principles and Techniques of Biochemistry and Molecular Biology (8th ed.). Cambridge University Press.
Supportive References	https://www.su.se/polopoly_fs/1.622041.1660576721!/columnholder/column2/linklayout/file/KB7014%20HT22.pdf
Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Well-equipped lab
Technology equipment (Projector, smart board, software)	Projector and smart board
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students' assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

