



Course Specifications

Revised November 2019

Course Title:	Research Project
Course Code:	4013953-3
Program:	BSc Microbiology
Department:	Biology
College:	Faculty of Applied Science – Department of Biology
Institution:	UM AL – QURA UNIVERSITY
Revision Date	November 2019

Table of Contents

A. Course Identification	3
6. Mode of Instruction (mark all that apply)	خطأ! الإشارة المرجعية غير معرّفة. 3
B. Course Objectives and Learning Outcomes	3
1. Course Description	3
2. Course Main Objective.....	4
3. Course Learning Outcomes	4
C. Course Content	6
D. Teaching and Assessment	7
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods	7
2. Assessment Tasks for Students	10
E. Student Academic Counseling and Support	خطأ! الإشارة المرجعية غير معرّفة. 10
F. Learning Resources and Facilities	10
1. Learning Resources	10
2. Facilities Required.....	11
G. Course Quality Evaluation	خطأ! الإشارة المرجعية غير معرّفة. 11
H. Specification Approval Data	12

A. Course Identification

1. Credit hours: 3 hours
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
Level/year at which this course is offered: 3 th Year / Summer semester.
4. Pre-requisites for this course (if any):
5. Co-requisites for this course (if any): None

Course Units/Credit Hours	3 credit hours					
		Contact hours	Private study			
Student workload	Lecture	20	20			
	Assignments	20	20			
	Practical	10	20			
	Exams & Quizzes	4	10			
	Sum	54	70			
	Total Sum	124				
Credits	4 ECTS C.Ps					
2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other: (Exams Quizzes)	Total
Contact Hours	20	0	0	0	4	24
Credit	3	0	0	0	0	3
3. Additional private study/learning hours expected of students per week.						8.75

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

At the end of this course student should be able to evaluate the different approaches used and suggest future experiments or alternative strategies for addressing the problem. The student should be able to conversant with writing a scientific report and presenting scientific data in a clear accessible manner. The skills learnt will be applicable to problem solving exercises encountered in all types of employment.

2. Course Main Objective

- **After completing this course student should be able to:**
- Gain practical and/or theoretical knowledge about particular area of microbiology.
- Work independently on the research project under the supervision of academic member of staff, and should be able to design experiments to answer the particular question posed, and critically analyzed the results. There will be scope for initiative in this element of the project.
- Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literatures.
- Summarize and provide a concise summary of relevant literatures.
- Displaying and organizing different types of data.
- Preparing and representing the data.
- Thinking about all new topics in the different fields of microbiology.
- Ability to design the laboratory experiment
- Carryout most the micro techniques in the field of microbiology.
- Understand and discuss the new research topics in field of microbiology.
- Ability to demonstrate oral presentation in the field of microbiology.
- Understand all new issues in microbiology.
- Ability to work in the important research projects.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
	<ul style="list-style-type: none"> ❖ Having successfully completed the course students should be <ul style="list-style-type: none"> • Gain practical and theoretical knowledge about particular area of Microbiology. • Work independently on the research project under the supervision of academic member of staff, and should be able to design experiments to answer the particular question posed, and critically analysed the results. There will be scope for initiative in this element of the project. • Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literatures. 	
2	Skills:	
2.1	Cognitive skills to be developed <ul style="list-style-type: none"> ❖ Having successfully completed the course students should be able to: <ul style="list-style-type: none"> • Summarize and provide a concise summary of relevant literatures. • Displaying and organizing different types of data. • Preparing and representing the data. • Thinking about all new topics in the different fields of microbiology. • Ability to design the laboratory experiment. • Carryout most the micro techniques in the field of microbiology. • Understand and discuss the new research topics in field of microbiology. 	

CLOs		Aligned PLOs
	<ul style="list-style-type: none"> • Ability to demonstrate oral presentation in the field of microbiology. • Understand all new issues in microbiology. • Ability to work in the important research projects. 	
2.2.	<p>Psychomotor Skills</p> <ul style="list-style-type: none"> ❖ Upon successful completion of this course, the student is expected to be able to: <ul style="list-style-type: none"> • Perform the laboratory experiments precisely • Operate all devices in lab • Ability to work in microbiological labs and the important research projects. 	
3	Competence:	
	<ul style="list-style-type: none"> ❖ Upon successful completion of this course, the student is expected to be able to: <ul style="list-style-type: none"> • Gain practical and theoretical knowledge about particular area of microbiology. • Work independently on the research project under the supervision of academic member of staff, and should be able to design experiments to answer the particular question posed, and critically analysed the results. There will be scope for initiative in this element of the project. • Summarize and provide a concise summary of relevant literatures. • Displaying and organizing different types of data. • Preparing and representing the data. • Thinking about all new topics in the different fields of microbiology. • Ability to design the laboratory experiment. • Carryout most the micro techniques in the field of microbiology. • Understand and discuss the new research topics in field of microbiology. • Ability to demonstrate oral presentation in the field of microbiology. • Understand and discuss all new issues in microbiology. • Ability to work in the important research projects. • Understand all new issues in microbiology • Ability to work in the important research projects • Developing oral presentations. • Communicating personal ideas and thoughts. • Work independently and as part of a team to finish some assignments. • Communicate results of work to others. • Demonstrate professional attitudes and behaviors towards others. • Propose the smart questions • Understand and dissecting the problem so that it is fully solved understood. • Demonstrate the assertiveness for his decision. • Demonstrate his capability for the responsibility and Accountability • Show Effective verbal communication with clarity and must be 	

CLOs		Aligned PLOs
	characterize with the following interpersonal attributes; (verbal communication, Non-verbal communication, good listening for the others, questioning, good manners, problem solving, Social awareness, self-management, responsibility and accountability) <ul style="list-style-type: none"> • Enhancing the ability of students to use computers and internet. • Interpret the laboratory data. • Know how to write a report. • Enhancing the ability of students to use computers and internet. • Interpret biostatistics data 	

C. Course Content

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
Introduction to research project	1	1
Where and how I start?: Thinking of research ideas, Purpose of research, Research questions or hypothesis, Are these questions/hypothesis feasible to achieve?, Problems with research questions/hypothesis, research title.	2	6
Project preparing: Project management, project timeline, project ethics	1	2
The literature review: Primary and secondary sources, quality of sources, Your literature review should tell a story, how to make it a story?, Speed reading and taking notes, Critical awareness while reading, How to search for information, Managing references, Various style of referencing systems.	2	9
Research methodology I: Research design, Research approach, building your way from research purpose, to question, to approach, to data gathering.	1	3
Methodology II: Types of research methods: experimental, Case studies, Cross-sectional studies, Longitudinal studies, surveys, Comparative studies, How to structure and write up your methodology?	1	3
Results analysis: Types of results, comparative analysis, statistical analysis, results presentation (tables, graphs, figures)	1	3
Concluding and writing up: Writing a discussion, writing a conclusion, writing an abstract and finalizing the title, general points about writing a research/review article and presentation coda	1	3
Set up a small project at (laboratory or field) parallel with theoretical lectures, for each student or a group of three students to begin to implement theoretical ideas on the ground (small training research point), collecting their own actual data, analyzing, representing the collected data, commenting, and critical discussing it and writing an essay about it. This essay will be revised by supervisor and critically discussed with the student/students group by examiners board (usually two departmental scientific staff members).	All weeks	Open time

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	<ul style="list-style-type: none"> ❖ After completing this course student should be able to: ❖ Gain practical and theoretical knowledge about particular area of Microbiology. ❖ Work independently on the research project under the supervision of academic member of staff, and should be able to design experiments to answer the particular question posed, and critically analysed the results. There will be scope for initiative in this element of the project. ❖ Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literatures. 	<ul style="list-style-type: none"> • The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important microorganisms in different applications and human service. • At the end of the program, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course. • All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions. • Using images and movies. • Encouraging students to collect the new information about what the new in biochemistry. Enable the reference books and scientific sites concerning biology in internet. 	<ul style="list-style-type: none"> • Submission of a literature review. • Submission of research report.
2.0	Skills		
2.1	Cognitive skills to be developed <ul style="list-style-type: none"> ❖ Having successfully 	<ul style="list-style-type: none"> • Lectures. • Brain storming. • Discussion. 	<ul style="list-style-type: none"> • Submission of a literature review.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	<p>completed the course students should be able to:</p> <ul style="list-style-type: none"> Summarize and provide a concise summary of relevant literatures. Displaying and organizing different types of data. Preparing and representing the data. Thinking about all new topics in the different fields of microbiology. Ability to design the laboratory experiment. Carryout most the micro techniques in the field of microbiology. Understand and discuss the new research topics in field of microbiology. Ability to demonstrate oral presentation in the field of microbiology. Understand all new issues in microbiology. Ability to work in the important research projects. 		<ul style="list-style-type: none"> Submission of research report.
2.2	<p>Psychomotor Skills</p> <ul style="list-style-type: none"> ❖ Upon successful completion of this course, the student is expected to be able to: <ul style="list-style-type: none"> Perform the laboratory experiments precisely Operate all devices in lab Ability to work in microbiological labs and the important research projects. 	<ul style="list-style-type: none"> Follow up the students in lab and during carryout all the laboratory experiments 	<ul style="list-style-type: none"> -Giving additional marks for the students they have accurate laboratory results and good seminar presentation -Practical exam.
2.3			
3.0	Competence		
	<ul style="list-style-type: none"> ❖ Upon successful completion of this course, the student is expected to be able to: <ul style="list-style-type: none"> Gain practical and theoretical knowledge about particular area of microbiology. Work independently on the research project under the supervision of academic member of staff, and should be able to 	<ul style="list-style-type: none"> - Lab work. - Case Study. - Active learning. - Small group discussion. 	<ul style="list-style-type: none"> - Oral exams. - Evaluate the efforts of each student in preparing the report. - Evaluate the scientific values of reports. - Evaluate the work in team - Evaluation of the role of each student in lab

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	<p>design experiments to answer the particular question posed, and critically analyzed the results. There will be scope for initiative in this element of the project.</p> <ul style="list-style-type: none"> • Summarize and provide a concise summary of relevant literatures. • Displaying and organizing different types of data. • Preparing and representing the data. • Thinking about all new topics in the different fields of microbiology. • Ability to design the laboratory experiment. • Carryout most the micro techniques in the field of microbiology. • Understand and discuss the new research topics in field of microbiology. • Ability to demonstrate oral presentation in the field of microbiology. • Understand and discuss all new issues in microbiology. • Ability to work in the important research projects. • Understand all new issues in microbiology • Ability to work in the important research projects • Developing oral presentations. • Communicating personal ideas and thoughts. • Work independently and as part of a team to finish some assignments. • Communicate results of work to others. • Demonstrate professional attitudes and behaviors towards others. • Propose the smart questions • Understand and dissecting the problem so that it is fully solved understood. • Demonstrate the assertiveness for his decision. 		<p>group assignment - Evaluation of students presentations</p>

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	<ul style="list-style-type: none"> Demonstrate his capability for the responsibility and Accountability Show Effective verbal communication with clarity and must be characterize with the following interpersonal attributes; (verbal communication, Non-verbal communication, good listening for the others, questioning, good manners, problem solving, Social awareness, self-management, responsibility and accountability) Enhancing the ability of students to use computers and internet. Interpret the laboratory data. Know how to write a report. Enhancing the ability of students to use computers and internet. Interpret biostatistics data 		

2. Assessment Tasks for Students

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Writing a literature review	7	30%
2	Participation / discussion / set up of small research project	All weeks	25%
3	Writing a brief proposal for a graduation project	15	45%
	Total Marks		100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Office hours: 10hrs.

F. Learning Resources and Facilities

1. Learning Resources

Required Text(s):

Writing Scientific Research Articles: Strategy and Steps. 2nd Edition.

by [Margaret Cargill](#) , [Patrick O'Connor](#), ISBN-13: 978-1118570708. 2013. Wiley-Black Well Press.,
 Enjoy Writing Your Science Thesis or Dissertation: A Step by Step Guide to Planning and Writing a Thesis or Dissertation for Undergraduate and Graduate Science Students. 2nd Edition by [Elizabeth M Fisher](#), [Richard C Thompson](#). ISBN-13: 978-1783264216. 2014. Imperial College Press.

 Recommended Reading List

Electronic Materials, Web Sites

- www.columbia.edu/cu/biology/ug/research/paper.html
<https://www.youtube.com/watch?v=0oAFVHb21HM>
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3474301/>

Other learning material such as computer-based programs/CD, professional standards/regulations

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> • Class room is already provided with data show • The area of class room is suitable concerning the number of enrolled students (68) and air conditioned
Technology Resources (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> • Digital lab containing 15 computers.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> • All equipments and devices: Incubators, centrifuges, autoclaves, measuring equipment, water bath, digital balances, pH meters, safety facilities. • Availability of some reference bacterial strains • Cultural media and all chemical that needed

G. Course Quality Evaluation

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching <ul style="list-style-type: none"> • Questionaries • Open discussion in the class room at the end of the lectures.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department <ul style="list-style-type: none"> • Revision of student answer paper by another staff member. • Analysis the grades of students.
3. Processes for Improvement of Teaching <ul style="list-style-type: none"> • Preparing the research project as PPT. • Using scientific movies. • Coupling the theoretical part with laboratory part • Periodical revision of course content.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution) <ul style="list-style-type: none"> • After the agreement of Department and Faculty administrations

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodical revision by Quality Assurance Units in the Department and institution**

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Prepared by faculty staff: 1. Dr Hussein H. Abulreesh. 2. Professor Shady M. ElShehawy.	Signature:
Date Report Completed: 1.12.2019	
Revised by: 1. Professor Shady M. ElShehawy. 2. Professor Khaled A. Elbanna. 3. Dr. Hussein H. Abulreesh.	Signature:
Date: 1.12.2019	
Program Chair: Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	