Program Handbook

For Bachelor's degree program in

Biology

2017

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2017

Vision of Biology Department

To be pioneering and distinguished in education, research and community services

Mission of Biology Department

Prepare a well-qualified graduates on strong base of facts and evidences from the world of life sciences and its wide applications so they are able to serve the community and able to respond to the requirements of the labor market

Objectives of Biology Department

(1)- Preparation of highly qualified educational and technical personnel
(2)- Developing and updating the curriculum in line with the modern scientific renaissance
(3)- To carry out outstanding scientific research that contributes to the development of science and serves the community
(4)- Localization of the latest scientific techniques in the fields of biology (Zoology / Botany / Microbiology)
(5)- Encouraging talented and distinguished students
(6)- Encouraging academic staff members and students to participate in conferences and scientific events/activities locally and internationally

2017

A. Program Identification and General Information

1. **Institution:** Umm Al-Qura University

2. **College/Department**: Faculty of Applied Science / Department of Biology

3. **Dean**: Dr Waleed J. Altaf

4. **branches/locations offering this program**

Branch/Location 1. Main campus (Males)-Al-Abedia, (Female)-AlZaher and AlAzizia / Makkah

Program title and code: B.Sc. Biology (40100)

Total credit hours needed for completion of the program: 137 credit hours

Award granted on completion of the program: Bachelor of Science (B.Sc.) in Biology.

Name of program coordinator or chair: Chairman of the Department of Biology: Dr. Hussein H. Abulreesh with quality committee members.

9. Date of approval by the authorized body (MOHE for private institutions and Council of Higher Education for public institutions): 01/01/1402 H (29/10/1981)

B. Program Context

1. Importance of the Program

a. Program aims:

This program aims to introduce students to the vast world of biological sciences and its essentials applications which involves directly to the lives of humans. The program has strong practical emphasis, providing students with all basic laboratory skills required for career either in applied or research biology.

The program will introduce students to the basic concepts of modern biology (invertebrates, plant kingdom, anatomy, vertebrates, biochemistry, animal physiology, plant physiology and molecular biology) in the first two years. Then the third and fourth year will introduce the advanced topics of biological science (ecology, environmental pollution, animal behavior, pest control, tissue culture, biotechnology, endocrinology).

During their studies, students will be exposed to a variety of information sources and techniques and be trained in various skills, including those used in reasoning, argument and communication. Students will acquire a number of transferable skills, including: design and execution of experiments (including working in a team); accessing information; interpretation of data using statistics; computing; essay and report writing; and oral and poster presentation.

b. Career Prospect

Umm Al-Qura University Biology graduates are qualified to enter a variety of careers such as
- **Governmental and private medical analysis labs.**
- **Teaching.**
- **Protected areas and environmental protection agencies.**
- **Research labs**.

c. Relevance to Institution/College Mission.

The mission of the University emphasizes the teaching of programs to support the economic development of Saudi Arabia and the skills needed by graduates for useful employment. This program is very important in:
- The mission of the Biology program agrees with the mission of the University.
- Combining between teaching, research and community services,
- The program enhances the University mission of offering quality education for students.
- Conducting scientific research and serving the local community in the Kingdom of Saudi Arabia.

d. Rrelevance of the program to the mission and goals of the institution.

The mission of the Department of Biology reads as "Prepare a well-qualified graduates on strong base of facts and evidences from the world of life sciences and its wide applications so they are able to serve the community and able to respond to the requirements of the labor market"

Mission, Goals and Objectives

Program Mission Statement

The mission of the BSc Biology program is to provide basic education in core subjects of modern biology and advanced and intensive training, with an emphasis on laboratory methodology, in basic and applied biology, and related areas for students planning careers in biology.

Program Goals and Objectives

(1) Prepare highly qualified educators and technicians.
(2) Develop a curriculum that is responsive to the needs of the employment market.
(3) To be well connected with the community to provide all possible educational programs that can solve problems and increase their awareness.
(4) Prepare pure and applied research projects and publish them in well-known and respected international journals.

Program Description:

Department Handbook is available to students or other stakeholders and a copy of the information relating to this program is also attached to the program specification. This information includes all required courses, credit hour requirements and Department/Faculty and institution requirements, and details of courses to be taken in each year or semester.

Study Plan (1437)

FIRST YEAR			
LEVEL 1			
Course No.	**Course Name**	**Credits**	**Preq.**
4021101	GENERAL CHEMISTRY	4	-
601101	ISLAMIC CALTURE 1	2	-
7001401	ENGLISH LANGUAGE	4	-
4041101	MATHEMATICS (CALCULUS)	4	-
605101	HOLY QURAN 1	2	-
Total credits		**16**	

LEVEL 2			
Course No.	**Course Name**	**Credits**	**Preq.**
4011101	GENERAL BIOLOGY	4	
7001401	ENGLISH FOR APPLIED SCIENCE	4	7001401
4031101	GENERAL PHYSICS	4	
501101	ARABIC LANGUAGE	2	
102101	BIOGRAPHY OF THE PROPHIT MOHAMMAD	2	-
Total credits		**16**	

SECOND YEAR			
LEVEL 3			
Course No	**Course Name**	**Credits**	**Preq.**
4022061	BIOSTATISTICS	2	
4012211	PLANT KINGDOM	3	4011101
4022301	ORGANIC CHEMISTRY	4	4021101
4012041	GENERAL ANATOMY	3	4011101
605201	HOLY QURAN II	2	605101
4012311	INVERTEBRATES	3	4011101
Total credits		**17**	

LEVEL 4			
Course No	**Course Name**	**Credits**	**Preq.**
4012232	PLANT TAXONOMY	3	4012211
4012242	PLANT ECOLOGY	3	4012211
4012322	VERTEBRATES	3	4012311
4012252	PHYCOLOGY	3	4011101
4012072	BIOCHEMISTRY	3	4022301
601201	ISLAMIC CULTURE II	2	601101
Total credits		**17**	

THIRD YEAR			
LEVEL 5			
Course No	**Course Name**	**Credits**	**Preq.**
4013331	ANIMAL PHYSIOLOGY I	3	4012172
4013261	PLANT PHYSIOLOGY I	3	4012172
4013281	GENETICS	3	4011101
4013291	FLORA OF SAUDI ARABIA	3	4012232
601301	ISLAMIC CULTURE III	3	601201
605301	HOLY QURAN III	2	605201
Total credits		**17**	

LEVEL 6			
Course No	**Course Name**	**Credits**	**Preq.**
4013352	ANIMAL ECOLOGY	3	4012322
4013362	ENTOMOLOGY	3	4012311
4013342	ANIMAL PHYSIOLOGY II	3	4013331
4013272	PLANT PHYSIOLOGY II	3	4013261
4013402	VIROLOGY AND BACTERIOLOGY	3	4011101
4013082	MOLECULAR BIOLOGY	3	4013281
Total credits		**18**	

FOURTH YEAR			
LEVEL 7			
Course No	**Course Name**	**Credits**	**Preq.**
4014311	PARASITOLOGY	3	4012311
4014321	FAUNA OF SAUDI ARABIA	3	4013352
4014331	PEST CONTROL	3	4013362
4014411	MYCOLOGY AND PLANT PATHOLOGY	2	4011101
4014091	ENVIRONMENTAL POLLUTION	2	4013352
605401	HOLY QURAN IV	2	605301
Total credits		15	

LEVEL 8			
Course No	**Course Name**	**Credits**	**Preq.**
4014342	ANIMAL BEHAVIOR	2	4014321
4014352	EMBRYOLOGY	3	4012322
4014212	TISSUE CULTURE	3	4013281
4014112	BIOTECHNOLOGY	3	4013182
4014362	ENDOCRINOLOGY	3	4013342
601401	ISLAMIC CULTURE IV	2	601301
Total credits		16	

FOURTH YEAR			
SUMMER			
Course No	**Course Name**	**Credits**	**Preq.**
4014923	FINAL YEAR PROJECT	5	

3. Practical Field Training: N/A

(a)- Brief description

(b)- At what stage or stages in the program does the field experience occur? (eg. year, semester)

(c)- Time allocation and scheduling arrangement. (eg. 3 days per week for 4 weeks, full time for one semester):

(d)- Number of credit hours (if any)

4. Research Project

a. Brief 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.

b. Major intended learning outcomes of the project or research task.

1. **Gain practical and theoretical knowledge about particular area of biology.**
2. **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.**
3. **Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literature.**

c. stage in the program that the project or research undertaken

- 4^{th} Year (summer semester).

d. Number of credit hours

- 5 credit hours.

e. Academic advising and support mechanisms for students.

1. **Students work directly under supervision of faculty member, individually or within a group.**
2. **Students use the researches laboratories in Biology Department.**
3. **Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week).**

f. Assessment procedures of the research Project

1- Writing a proposal for a research project	45%
2- Writing a literature review	30%
3- Participation / discussion	25%

NQF Learning Domains and Learning Outcomes of the Program Knowledge

	NQF Learning Domains and Learning Outcomes
1.0	
1.1	**To know the ethics of biology and related areas of science.**
1.2	**To design methods for analyzing and solving problems in the field of biology and its applications.**
1.3	**To think critically in evaluating biological information.**
1.4	**To implement projects related to his study in biology program.**
2.0	
2.1	**To understand the importance of scientific research and look at the recent advances in biological sciences.**
2.2	**To prepare, explore, identify, analyze and evaluate various scientific problems and solutions.**
2.3	**To compare and contrast the methods of scientific research and the ability to design and evaluation of scientific research.**
3.0	
3.1	**To involve working independently and with multi-disciplinary teams.**
3.2	**To cooperate in providing scientific and technical services in various fields for all sectors.**
4.0	
4.1	**To use the computer to prepare written reports, evaluate scientific data and calculations.**
4.2	**To use the internet to conduct search for published articles and books.**
5.0	
5.1	**To perform basic and advanced biological laboratory techniques.**
5.2	**To be able to operate laboratory instruments.**

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Program Learning Outcome Mapping Matrix

The courses that are required to teach the program learning outcomes are identified in the following table. The program learning outcomes are inserted according to the level of instruction, from this table below the courses and levels that are required to teach each one are indicated; using program's course numbers across the top and the following level scale. Levels: (Low =I) = Introductory (Medium =P) = Proficient (High = A) = Advanced

	Course Offerings NQF Learning Domains and Learning Outcomes	4011011	4012211	4012311	4012041	4012061	4012072	4012232	4012322	4012242	4012252	4013331	4013261	4013281
1.0	**Knowledge**													
1.1	To know the ethics of biology and related areas of science	I	I	I	I	I	I	I	I	I	I	P	P	P
1.2	To design methods for analyzing and solving problems in the field of biology and its applications	x	I	I	I	I	I	I	I	I	I	P	P	P
1.3	To think critically in evaluating biological information	I	I	I	I	I	I	I	I	I	I	P	P	P
1.4	To implement projects related to his study in biology program.	x	x	x	x	x	x	x	x	x	X	P	P	P
2.0	**Cognitive Skills**													
2.1	To understand the importance of scientific research and look at the recent advances in biological sciences	x	I	I	I	I	I	I	I	I	I	P	P	P
2.2	To prepare, explore, identify, analyze and evaluate various scientific problems and solutions.	I	I	I	I	I	I	I	I	I	I	P	P	P
2.3	To compare and contrast the methods of scientific research and the ability to design and evaluation of scientific research	I	I	I	I	I	I	I	I	I	I	P	P	P
3.0	**Interpersonal Skills & Responsibility**													
3.1	To involve working independently and with multi-disciplinary teams.	I	I	I	I	I	I	I	I	I	I	P	P	P
3.2	To cooperate in providing scientific and technical services in various fields for all sectors	I	I	I	I	I	I	I	I	I	I	P	P	P
4.0	**Communication, Information Technology, Numerical**													
4.1	To use the computer to prepare written reports, evaluate scientific data and calculations	I	I	I	I	I	I	I	I	I	I	P	P	P
4.2	To use the internet to conduct search for published articles and books	I	I	I	I	I	I	I	I	I	I	P	P	P
5.0	**Psychomotor**													
5.1	To perform basic and advanced biological laboratory techniques	I	I	I	I	I	I	I	I	I	I	P	P	P
5.2	To be able to operate laboratory instruments	I	I	I	I	I	I	I	I	I	I	P	P	P

	Course Offerings NQF Learning Domains and Learning Outcomes	4013291	4013352	4013362	4013342	4013272	4013402	4013082	4014311	4014321	4014331	4014411	4014091	4014342
1.0	**Knowledge**													
1.1	To know the ethics of biology and related areas of science	P	P	P	P	P	P	P	A	A	A	A	A	A
1.2	To design methods for analyzing and solving problems in the field of biology and its applications	P	P	P	P	P	P	P	A	A	A	A	A	A
1.3	To think critically in evaluating biological information	P	P	P	P	P	P	P	A	A	A	A	A	A
1.4	To implement projects related to his study in biology program.	P	P	P	P	P	P	P	A	A	A	A	A	A
2.0	**Cognitive Skills**													
2.1	To understand the importance of scientific research and look at the recent advances in biological sciences	P	P	P	P	P	P	P	A	A	A	A	A	A
2.2	To prepare, explore, identify, analyze and evaluate various scientific problems and solutions.	P	P	P	P	P	P	P	A	A	A	A	A	A
2.3	To compare and contrast the methods of scientific research and the ability to design and evaluation of scientific research	P	P	P	P	P	P	P	A	A	A	A	A	A
3.0	**Interpersonal Skills & Responsibility**													
3.1	To involve working independently and with multi-disciplinary teams.	P	P	P	P	P	P	P	A	A	A	A	A	X
3.2	To cooperate in providing scientific and technical services in various fields for all sectors	P	P	P	P	P	P	P	A	A	A	A	A	X
4.0	**Communication, Information Technology, Numerical**													
4.1	To use the computer to prepare written reports, evaluate scientific data and calculations	P	P	P	P	P	P	P	A	A	A	A	A	A
4.2	To use the internet to conduct search for published articles and books	P	P	P	P	P	P	P	A	A	A	A	A	A
5.0	**Psychomotor**													
5.1	To perform basic and advanced biological laboratory techniques	P	P	P	P	P	P	P	A	A	A	A	A	X
5.2	To be able to operate laboratory instruments	P	P	P	P	P	P	P	A	A	A	A	A	X

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	Course Offerings NQF Learning Domains and Learning Outcomes	4014352	4014212	4014112	4014362	4014923								
1.0	**Knowledge**													
1.1	To know the ethics of biology and related areas of science	A	A	A	A	A								
1.2	To design methods for analyzing and solving problems in the field of biology and its applications	A	A	A	A	A								
1.3	To think critically in evaluating biological information	A	A	A	A	A								
1.4	To implement projects related to his study in biology program.	A	A	A	A	A								
2.0	**Cognitive Skills**													
2.1	To understand the importance of scientific research and look at the recent advances in biological sciences	A	A	A	A	A								
2.2	To prepare, explore, identify, analyze and evaluate various scientific problems and solutions.	A	A	A	A	A								
2.3	To compare and contrast the methods of scientific research and the ability to design and evaluation of scientific research	A	A	A	A	A								
3.0	**Interpersonal Skills & Responsibility**													
3.1	To involve working independently and with multi-disciplinary teams.	A	A	A	A	A								
3.2	To cooperate in providing scientific and technical services in various fields for all sectors	A	A	A	A	A								
4.0	**Communication, Information Technology, Numerical**													
4.1	To use the computer to prepare written reports, evaluate scientific data and calculations	A	A	A	A	A								
4.2	To use the internet to conduct search for published articles and books	A	A	A	A	A								
5.0	**Psychomotor**													
5.1	To perform basic and advanced biological laboratory techniques	A	A	A	A	A								
5.2	To be able to operate laboratory instruments	A	A	A	A	A								

5. Admission Requirements for the Program

Department guide handbook includes the description of admission requirements including any course or experience prerequisites.

6. Attendance and Completion Requirements

Department guide handbook includes description of requirements for: a. Attendance. b. Progression from year to year. c. Program completion or graduation requirements.

E. Regulations for Student Assessment and Verification of Standards

*Check of sample exam papers and assignments.

F. Student Administration and Support

1. Student Academic Counselling

(1)- Academic advisor is assigned for students to provide guidance and assistance regarding their program planning.
(2)- All academic staff members will specify “office hours” for meeting students every semester.
(3)- Faculty of Applied Science Course Coordinator (also Faculty of Applied Science vice dean for academic affairs) is responsible for guiding and assisting all students regarding their program planning and solving their academic problems and providing academic / non-academic counselling.

G. Learning Resources, Facilities and Equipment

(1)- Every academic year the University main library “King Abdullah Library” contact every single Faculty (College) within the university regarding recommending textbooks and other references for both undergraduates and postgraduates programs offered by every single department.
(2)- All major research / reviews journals are free to access their full text through the services of King Abdullah Library via Saudi Digital Library.

Acquisition resources for library, laboratories, and classrooms.

(1) Classrooms within the building of the Faculty of Applied Science are fully equipped with audio/visual equipments for teaching purposes.
(2) Laboratories within the Department of Biology are fully equipped with instruments / chemicals / culture media for every course intended to be delivered in the appropriate laboratory.

Academic staff member can report any damages / shortcomings of the classrooms facilities to the Faculty of Applied Science vice dean so the necessary maintenance can take place. Likewise,

academic staff member and laboratory technician report to the department chair any shortcoming of the instruments / chemicals so the department chair can request maintenance or replacement through the Faculty of Applied Science vice dean of postgraduate studies and research.

H. Faculty and other Teaching Staff

1. Appointments

- Distinguished graduates are given the chance to compete for available job posts as (teaching assistant / demonstrators) were they will be employed in the department then they are given scholarships for M.Sc and Ph.D degrees after that they are employed as faculty members and verification of their credentials.
- A departmental faculty application committee inspects the resumes of the applicants and checks on their experience in teaching.
- Applicants are interviewed by senior academic administrators
- Presentations on the topics of interest are made in the department and evaluated by the departmental council.

2. Participation in Program Planning, Monitoring and Review

- Current programs are reviewed annually within the divisions of the department by individual faculty members and the group as a whole.
- A departmental committee is formed to look into the recommendations of various divisions and to make a final proposal.
- The revised program is discussed in the departmental council before approval.
- Held Meetings, dialogues and debate sessions.
- Questionnaires are assigned for faculty members to express an opinion on the program.
- Evaluation of questionnaires and stand on weaknesses in the program.
- Ask for advice from colleagues in similar departments of other universities.

3. Professional; Development

Development of faculty and teaching staff

Improvement of skills in teaching and student assessment

(1)- Workshops for various aspects of academic development are conducted frequently over the academic year.
(2)- Peer consultation in teaching is conducted over the academic year for the faculty upon their own request.
(3)- Workshops run on a regular basis.
(4)- Training courses to prepare faculty members.
(5)- The participation of faculty members in distance education courses.

Professional development including knowledge of research and developments in their field of teaching microbiology

(1)- Workshops run by international experts are conducted frequently throughout the academic year on emerging teaching and learning strategies.
(2)- Sponsoring grants for research and innovation in teaching and learning are offered.
(3)- Faculty members attend conferences, workshops and sabbatical leaves to enhance their knowledge of research in the field of teaching.
(4)- Involvement of faculty members in specialized courses in the methodology of scientific research and modern teaching methods.

I. Program Evaluation and Improvement Processes

1. Effectiveness of Teaching

Evaluation and improve the strategies for developing learning outcomes in the different domains of learning as follows

- Faculty members attend training courses conducted by specialists in the teaching and learning strategies.
- Student course evaluations completed for all courses each year.
- By the results achieved for each course and to achieve the goals set for each curriculum and program.
- The use of modern methods of teaching and evaluation.
- Displaying the curriculum from time to time to update the evaluation to keep up with modern education and learning processes.

Evaluation of the skills of faculty and teaching staff in using the planned strategies

(1)- Peer reviews.
(2)- Faculty self reports in course reports.
(3)- Student Course evaluation.
(4)- Questionnaires are assigned for students to express their opinion on the department faculty members.
(5)- Evaluation of questionnaires and stand at the level of teaching staff skills.

2. Overall Program Evaluation

Strategies are used in the program for obtaining assessments of the overall quality of the program and achievement of its intended learning outcomes

(i) From current students and graduates of the program

- Graduating students surveys.
- Alumni surveys.
- Questionnaires are assigned for current and graduated students to express an opinion

on the program.

- Evaluation of questionnaires and stand on weaknesses in the program**.**

(ii) From independent advisors and/or evaluators

- Self-assessment report reviewed by external experts.
- Professional experts societies assessment.

Recruitment of consultants and making workshops debate.

(iii) From employers and/or other stakeholders.

- Employers surveys.