

Course catalogue



Submitted By

Department of Biology
College of Science, Al Zulfi
Majmaah University
Saudi Arabia

Date, Month (If any)

Majmaah University Mission

The mission of Majmaah University is to offer educational programs with high quality as well as funding all types of research projects and social initiatives that contribute in achieving the sustainable development. We also committed to instill the concept of patriotism and educate students about the culture and heritage of the country.

College Mission

The College provides educational services to its community according to national and international standards of quality, and to develop highly scientific and academic qualified graduates and successful competitors in the labor market to contribute to the national development.

Biology Program Mission

Give an excellent educational service for undergraduate students in biology making them capable to be competent in accordance with the standards of the labor market and provide a stimulating academic environment for research and education and provide knowledge services to the community.

Biology Program Vision

The department looking forward to be pioneer in the field of biology, environmental sciences and biotechnology at the local, regional and global level by contributing to study and solve problems facing the community, doing scientific research to find the appropriate.

Biology Program Goals

- Prepare the qualified cadres according to the requirements of the labor market to contribute to the developing and comprehensive development in the kingdom.
- Providing with technical services to the government and private sectors.
- Promoting the scientific research in the field of biology and participate in national and international conferences.
- Providing a young generation of scientists and researchers.
- Contribution in solving the scientific and industrial problems facing the development plans in KSA.

Program learning outcomes

PLO	KPIs	Indicators
K1: Recognize the basic concepts, principles, scientific terminologies and facts in all major biological disciplines and other related sciences.	KPI(1)	To know the biology definitions
	KPI(2)	State of the biological phenomena and their mechanisms
	KPI(3)	Describe and recode biological concepts in all disciplines
K2: Outline the different biological processes of the living organisms showing the adaptation to the environment.	KPI(4)	Classify living organisms matching with the taxonomic features and their ecological behaviours.
	KPI(5)	Predict the relationship between species and their internal (physiological) and external environments
K3: Gain basic knowledge on identification, routine procedures and technical requirements of different scientific tools and equipment	KPI(6)	To know the principles and procedures in biological and scientific disciplinary
	KPI(7)	Explain biotic (plant, animal, microbial, macromolecules) and abiotic (water) parts in the models

Program learning outcomes

PLO	KPIs	Indicators
S1: Apply biological concepts using integration of academic knowledge and professional skills in biological sciences	KPI(8)	Correlate between various ecosystems and living organisms.
	KPI(9)	Describe the various adaptive and physiological features of all organisms
	KPI(10)	Development and implementation of identification and naming the organisms
	KPI(11)	Understand economic importance of microorganisms, plants and animals
S2: Investigate relatively complex scientific problems, facts and opinions using a range of knowledge extension to recommend classical or innovative solutions with limited guidance.	KPI(12)	Compare or differentiate between different types of cells and tissues in plants, animals and microorganisms
	KPI(13)	Distinguish the various organs of the body in animals and plants and summarizing their functions
S3: Demonstrate functions of macromolecules (e.g. DNA, proteins, lipids etc.,) in different biological systems and their applications	KPI(14)	Illustrate the life cycle showing the mechanism of the developmental stages of organism and macromolecules
	KPI(15)	Clarify the molecular biology, genetics concepts describing the applications of biological methods (bioinformatics, biotechnology etc.,) to human and environment.
	KPI(16)	Differentiate microbial infections of all living organisms and their immunological, molecular mechanisms
S4: Use perfectly the living specimens ,slides and instruments in the biological experiments.	KPI(17)	Examine the biological slides/Spotters/Specimen and perform dissection of the biological samples
	KPI(18)	Carry out the laboratory experiments
	KPI(19)	Use advanced equipment (computer, statistical tools) to analyse the laboratory data

Program learning outcomes

PLO	KPIs	Indicators
V1: Exhibit leadership and personal responsibilities to accomplish group or individual activities in a professional manner.	KPI(20)	Committee toward group task contributing ideas.
	KPI(21)	Effective communication of their scientific concepts (e.g. oral presentation, viva voce, assignment, research project etc).
V2: Communicate effectively using the proper presentation forms, scientific language and reasoning appropriate for different issues and audiences.	KPI(22)	Effectively plan and prepare the scientific report
	KPI(23)	Autonomously organize the collected information and presentation.
	KPI(24)	Professionally manage tasks and participate the activities related to training, community work.

Majmaah University (MU) is a public university founded to provide a whole host of educational, research and community services to students living within the university's geographical area. The university was established based on the approval of the Custodian of the Two Holy Mosques King Abdullah bin Abdulaziz Al Saud - Prime Minister and Chairman of the Council of Higher Education on the 3rd of Ramadan 1430 AH corresponding to August 24, 2009 along with three other universities in Dammam, Al-Kharj and Shaqra Governorates. MU comprises nine existing colleges and three other colleges under construction to service a number of governorates and centers including: Majmaah, Zulfi, Ghat, Ramah, and Hawtat Sudair Center.

MU has helped in meeting the needs of the growing number of high school graduates, has brought about social and psychological stability for the people in the region, and has eased the burden on universities in large cities. The university has also created scientific and cultural movement to the local community, while working on serving the community in social, awareness, educational and training fields.

Since its establishment, MU has overcome big challenges and set strategic goals in different fields, taking into account the regular improvement procedures for its practices and organizational structures. A whole host of remarkable achievements were achieved at the academic level along with several awards locally, regionally and internationally.

Being the first university among its counterparts in e-transactions transformation is a milestone in the university's history. This is coupled with winning advance places for inventions at the local and international levels. The university has also obtained the institutional academic accreditation, and many academic programs achieved the accreditation which contributed in improving the university's ranking in research.

The College of Science at Majmaah University is well-known for combining advanced theoretical education with precise practical application in the fields of basic sciences. The College creates an inspiring and conducive learning environment, along with advanced research facilities, making it an ideal destination for students.

The College offers programs in core scientific disciplines, including Biology, Chemistry, Physics, Mathematics, and Computer and Information Sciences that meet the needs and requirements of the labor market. The College empowers students to engage in groundbreaking research through state-of-the-art laboratories, equipped with cutting-edge technologies, offering them the chance to tackle real-world challenges in environmental, industrial, and other fields.

The College actively drives sustainable development by connecting scientific innovation to sustainability initiatives and contributing to research and projects that advance Saudi Arabia's Vision 2030. The College has a group of faculty renowned for their exceptional expertise in education and research. The College supports innovation and creativity, encouraging students to engage in critical thinking and develop innovative solutions to global challenges. Specialized and dynamic student clubs are dedicated to fostering excellence on both local and global stages. The College actively engages in community service and volunteer initiatives, empowering students to apply their scientific knowledge to real-world challenges, cultivate a strong sense of responsibility, and make a lasting positive impact on their communities. It supports and nurtures students through academic and psychological advisory programs and outstanding student activities aimed at developing social and leadership skills.

The College actively collaborates with various sectors and establishes partnerships with research, industrial, and medical institutions to provide field training opportunities, linking theoretical study with practical application. Wide-ranging career opportunities await graduates of the College of Science, as the College is committed to qualifying students to work across multiple fields in alignment with the evolving demands of the job market.

The Biology Department is a part of the College of Science at Majmaah University, whose branch is located in Zulfi Governorate. It is part of the main academic departments within the College of Science, which also includes the departments of Chemistry, Computer Science, and Physics.

Specialization: The department offers a **Bachelor of Science in Biology program**, focusing on theoretical and applied aspects in fields such as microbiology, botany, zoology, genetics, ecology, molecular biology, and biotechnology; and **Bachelor of Science in Environmental Protection Technology program**, focusing on theoretical and applied aspects in fields of ecology to prepare students for professional practice and ethical conduct to achieve a sustainable environment locally and globally.

Biology program

Vision

The department looking forward to be a pioneer in the field of biology, environmental sciences and biotechnology at the local, regional and global level by contributing to study and solve problems facing the community, doing scientific research to find the appropriate.

Mission

Give an excellent educational service for undergraduate students in biology making them capable to be competent in accordance with the standards of the labor market and provide a stimulating academic environment for research and education and provide knowledge services to the community.

Objectives

- Prepare the qualified cadres according to the requirements of the labor market to contribute to the developing and comprehensive development in the kingdom.

- Providing with technical services to the government and private sectors.
- Promoting the scientific research in the field of biology and participate in national and international conferences.
- Providing a young generation of scientists and researchers.
- Contribution in solving the scientific and industrial problems facing the development plans in KSA.

After completing the Biology program, students can get many job opportunities in the following sectors

- Public education.
- Universities.
- Ministry of Agriculture in many areas such as soil laboratories, water, plant and animal wealth.
- The National Commission for Wildlife Conservation.
- Ministry of Health Labs.
- Municipalities.
- Water and Sanitation.
- Specifications and standards in areas such as the quality laboratories.
- Planning and Environmental Health at the Ministry of Municipal and Rural Affairs.
- Food packaging factories.
- Agricultural crops silos.
- Medical analysis laboratories.
- Food and Drug Authority.

Requirements

1. He should have obtained a general high school certificate or its equivalent from within or without the Kingdom of Saudi Arabia with a cumulative GPA of 70% or higher.
2. Students transferred from inside or outside the university must have a GPA of no less than 2.75% and be on a scientific track.
3. His high school certificate or its equivalent should not be older than five years. The University Council may make some exceptions if convincing reasons are provided.
4. He should be of a good conduct.
5. He should successfully pass any test or interview assigned by the University Council.
6. He should be medically fit.
7. He should provide a permission for study from his reference, if he works in government or private sector
8. He should satisfy any other conditions the University Council determines, announced during application.
9. He should not be dismissed from any other university for disciplinary or academic reasons. If that became clear after his, his acceptance shall be deemed cancelled from the day of his admission.
10. A student dismissed from the University for Academic Reasons may be enrolled in some programs that do not award a Bachelor Degree, as decided by the University Council, or whoever it delegates. This shall not be allowed for the transitional program.
11. Those who already had obtained a Bachelor Degree or its equivalent shall not be admitted to obtain another Bachelor degree. The University Rector has the right for exceptions.
12. A student registered for another university degree or below, shall not be admitted, either in the selfsame university or another.

Study Plan:

Level (1)

Course Code	Course Title	Hours Distribution			Prerequisite
		Theoretical	Practical	Credit	
---	University Compulsory	2	-	2	-
---	University Compulsory	2	-	2	-
SENG-101	Scientific English	3	-	3	
BIOL-101	General Biology	3	-	3	
CSI-101	Introduction to Computer Science	3	-	3	
CHEM-101	General Chemistry-1	3	-	3	
-	Elective college requirement	2	-	2	
Total		18			

Level (2)

Course Code	Course Title	Hours Distribution			Prerequisite
		Theoretical	Practical	Credit	
---	University Compulsory	2	-	2	-
PHYS-101	General Physics-1	3	-	3	-
BIOL-102	Cell Biology	2	2	3	BIOL-101
BIOL-111	Animal Physiology	2	2	3	BIOL-101
BIOL-112	Invertebrates	2	2	3	BIOL-101
BIOL-121	Plant Anatomy & Morphology	2	2	3	BIOL-101
Total		17			

Level (3)

Course Code	Course Title	Hours Distribution			Prerequisite
		Theoretical	Practical	Credit	
---	University Compulsory	2	-	2	-
BIOL-213	Vertebrates	2	2	3	BIOL-112
BIOL-214	Animal Histology	2	2	3	BIOL-102
CHEM-211	Organic Chemistry	2	2	3	CHEM-101
BIOL-222	Plant Taxonomy	2	-	2	BIOL-121
BIOL-241	Ecology	2	-	2	BIOL-101
MATH-131	Basis of Mathematics	2	2	3	-
Total		18			

Level (4)

Course Code	Course Title		Hours Distribution			Prerequisite
			Theoretical	Practical	Credit	
---	University Compulsory		2	-	2	-
BIOL-223	Plant Physiology		2	2	3	BIOL-222
BIOL-215	Comparative Anatomy		2	2	3	BIOL-213
BIOC-221	Biochemistry		2	2	3	CHEM-211
BIOL-231	General Microbiology		2	2	3	BIOL-101 BIOL-102 BIOL-222
BIOL-242	Environmental pollution	Department Elective course	2	-	2	BIOL-241
BIOL-243	Biodiversity		2	-	2	
Total			16			

Level (5)

Course Code	Course Title		Hours Distribution			Prerequisite
			Theoretical	Practical	Credit	
-	University Compulsory		2	-	2	-
BIOL-316	Entomology		3	-	3	BIOL-112
BIOL-344	Plant Ecology		2	2	3	BIOL-223 BIOL-241
BIOL-332	Bacteriology		2	2	3	BIOL-231
BIOL-333	Mycology		2	2	3	BIOL-231
BIOL-351	Genetics		2	2	3	BIOL-102 BIOL-111
Total			17			

Level (6)

Course Code	Course Title		Hours Distribution			Prerequisite
			Theoretical	Practical	Credit	
BIOL-334	Virology		2	-	2	BIOL-231
BIOL-335	Parasitology		2	2	3	BIOL-231
BIOL-361	Instrumentation & Microscopic Preparations		1	2	2	BIOL-121 BIOL-214 BIOL-332 BIOL-333
BIOL-345	Animal Ecology & Behavior		2	2	3	BIOL-241 BIOL-111
BIOL-352	Molecular Biology		2	2	3	BIOL-351
BIOL-317	Marine Biology		2	2	3	BIOL-112 BIOL-213 BIOL-241
Total			17			

Level (7)

Course Code	Course Title		Hours Distribution			Prerequisite
			Theoretical	Practical	Credit	
BIOL-436	Immunology		3	2	4	BIOL-231
BIOL-446	Epidemiology		2	2	3	BIOL-361
BIOL-453	Genetic Engineering		2	2	3	BIOL-352
BIOL-471	Graduation Project (theoretical part)		0	4	2	BIOL-215 BIOL-223 BIOL-352 BIOL-361
---	Free Course		3	-	3	---
BIOL-473	Summer Training		-	2	1	BIOL-361
BIOL-447	Eco-physiology	Department Elective course	2	-	2	BIOL-344
BIOL-425	Medicinal & Economic plants		2	-	2	
Total			18			

Level (8)

Course Code	Course Title		Hours Distribution			Prerequisite
			Theoretical	Practical	Credit	
BIOL-454	Applied Biotechnology		2	2	3	BIOL-453
BIOL-455	Bioinformatics		2	2	3	BIOL-352
BIOL-418	Animal Taxonomy		2	-	2	BIOL-215
BIOL-419	Embryology		2	2	3	BIOL-215
---	Free Course		3	-	3	---
BIOL-472	Graduation Project (practical part)		-	4	2	BIOL-471
Total			16			

Environment Protection Technology program

Vision

The department looking forward to be a pioneer in the field of biology, environmental sciences and biotechnology at the local, regional and global level by contributing to study and solve problems facing the community, doing scientific research to find the appropriate.

Mission

Give an excellent educational service for undergraduate students in biology making them capable to be competent in accordance with the standards of the labor market and provide a stimulating academic environment for research and education and provide knowledge services to the community.

Objectives

- Develop a fundamental understanding of environmental sciences and the use of modern methods to protect and improve the environment.
- Enable students to apply their knowledge and take necessary actions to preserve, rehabilitate, and enhance the environment.
- Conduct both basic and applied research in environmental sciences.
- Contribute to solving scientific, environmental, and industrial challenges in the Kingdom of Saudi Arabia through the application of scientific knowledge and the implementation of public awareness campaigns.

After completing the Environment Protection Technology program, students can get many job opportunities in the following sectors

- Environmental Analysis Specialist.
- Employment in research centers related to environmental affairs.
- Water Quality Analysis Specialist.
- Employment at the Wildlife Authority.
- Environmental Inspector in relevant authorities.
- Food Quality Inspector in relevant authorities.
- Employment at the Ministry of Agriculture (Soil Analysis Laboratories).
- Occupational Health and Safety Specialist in various authorities.

Requirements

1. He should have obtained a general high school certificate or its equivalent from within or without the Kingdom of Saudi Arabia with a cumulative GPA of 70% or higher.
2. Students transferred from inside or outside the university must have a GPA of no less than 2.75% and be on a scientific track.
3. His high school certificate or its equivalent should not be older than five years. The University Council may make some exceptions if convincing reasons are provided.
4. He should be of a good conduct.
5. He should successfully pass any test or interview assigned by the University Council.
6. He should be medically fit.
7. He should provide a permission for study from his reference, if he works in government or private sector

8. He should satisfy any other conditions the University Council determines, announced during application.
9. He should not be dismissed from any other university for disciplinary or academic reasons. If that became clear after his, his acceptance shall be deemed cancelled from the day of his admission.
10. A student dismissed from the University for Academic Reasons may be enrolled in some programs that do not award a Bachelor Degree, as decided by the University Council, or whoever it delegates. This shall not be allowed for the transitional program.
11. Those who already had obtained a Bachelor Degree or its equivalent shall not be admitted to obtain another Bachelor degree. The University Rector has the right for exceptions.
12. A student registered for another university degree or below, shall not be admitted, either in the selfsame university or another.

Study Plan:

Level 1	Course Number	Course Code	Distribution of Credit Hours				Number & Code of Pre-requisite	Name of Prerequisite (Co-Requirement)
Course Title			CrH	T	P	Tr		
English Grammar	111	ENGD	3	3	0	0		
English Reading Skill	112	ENGD	3	3	0	0		
English Writing Skill	113	ENGD	3	3	0	0		
English Listening and Speaking Skill	114	ENGD	3	3	0	0		
English Vocabulary Building	115	ENGD	3	3	0	0		
Total			15					

Level 2	Course Number	Course Code	Distribution of Credit Hours				Number & Code of Pre-requisite	Name of Prerequisite (Co-Requirement)
Course Title			CrH	T	P	Tr		
General ecology	101	ENV	3	2	2	0		
General zoology	102	ENV	3	2	2	0		
General botany	103	ENV	3	2	2	0		
General Chemistry	104	ENV	3	2	2	0		
General Microbiology	161	ENV	3	2	2	0		
Environmental Toxicology	131	ENV	3	2	2	0		
Field training-1	181	ENV	0	0	0	0		
Total			18					

Level 3	Course Number	Course Code	Distribution of Credit Hours				Number & Code of Pre-requisite	Name of Prerequisite (Co-Requirement)
Course Title			CrH	T	P	Tr		
Hazardous waste management	221	ENV	2	2	0	0		
Air and water pollution	232	ENV	2	2	0	0		
Ecosystems and Biodiversity	211	ENV	2	2	0	0	ENV-101	General ecology
Environmental Microbiology	262	ENV	3	2	2	0	ENV-161	General Microbiology
Protecting the environment and natural resources	212	ENV	2	2	0	0	ENV-101	General ecology
Drinking water management and quality	222	ENV	3	2	2	0	ENV-104	General Chemistry
Management and environmental impact assessment	223	ENV	2	2	0	0	ENV-101	General ecology
Instrumentation & Microscopic Preparations	271	ENV	2	1	2	0	ENV-161	General Microbiology
Total			18					

Level 4	Course Number	Course Code	Distribution of Credit Hours				Number & Code of Pre-requisite	Name of Prerequisite (Co-Requisite)
Course Title			CrH	T	P	Tr		
The Arabian Gulf Ecosystem	213	ENV	2	2	0	0	ENV-211	Ecosystems and Biodiversity
Invertebrate Ecology	241	ENV	3	2	2	0	ENV-102	General zoology
Animal environment and pollution	233	ENV	2	2	0	0	ENV-132	Air and water pollution
Ecological Entomology	242	ENV	3	2	2	0	ENV-102	General zoology
Integrated management of protected areas	224	ENV	2	2	0	0	ENV-223	Management and environmental impact assessment
Biodegradation	263	ENV	3	2	2	0	ENV-262	Environmental Microbiology
Plant Anatomy & Morphology	251	ENV	3	2	2	0	ENV-103	General botany
Field training-2	282	ENV	0	0	0	0	--	--
Total			18					

Level 5	Course Number	Course Code	Distribution of Credit Hours				Number & Code of Pre-requisite	Name of Prerequisite (Co-Requisite)
Course Title			CrH	T	P	Tr		
Sustainable development of natural resources	325	ENV	2	2	0	0	ENV-224	Integrated management of protected areas
Animal Physiology	343	ENV	3	2	2	0	ENV-241	Invertebrate Ecology
Natural resources in desert areas	326	ENV	2	2	0	0	ENV-212	Protecting the environment and natural resources
Plant Physiology	352	ENV	3	2	2	0	ENV-251	Plant Anatomy & Morphology
Animal Behavior	344	ENV	2	2	0	0	--	--
Elective courses			2	2	0	0	--	--
University elective			2	2	0	0	--	--
Total			16					

Level 6	Course Number	Course Code	Distribution of Credit Hours				Number & Code of Pre-requisite	Name of Prerequisite (Co-Requisite)
Course Title			CrH	T	P	Tr		
Vertebrate ecology	345	ENV	3	2	2	0	ENV-241	Invertebrate Ecology
Biochemistry	372	ENV	3	2	2	0	ENV-104	General Chemistry
Marine Environmental Sciences	346	ENV	3	2	2	0	ENV-241	Invertebrate Ecology
Environmental Laws and Ethics	327	ENV	2	2	0	0	--	--
University elective			2	2	0	0	--	--
University elective			2	2	0	0	--	--
Total			15					

Level 7	Course Number	Course Code	Distribution of Credit Hours				Number & Code of Pre-requisite	Name of Prerequisite (Co-Requisite)
Course Title			CrH	T	P	Tr		
Genetics	464	ENV	2	2	0	0	ENV-343	Animal Physiology
Plant Adaptation	453	ENV	2	2	0	0	ENV-352	Plant Physiology
Microbial diversity	465	ENV	3	2	2	0	ENV-263	Biodegradation
Introduction of geographical Information System & remote sensing	473	ENV	2	2	0	0	ENV-223	Management and environmental impact assessment
Environmental Physiology	414	ENV	2	2	0	0	ENV-343 ENV-352	Animal Physiology Plant Physiology
Environmental Modeling	483	ENV	3	2	0	2	--	--
University elective			2	2	0	0	--	--
Total			16					

Level 8	Course Number	Course Code	Distribution of Credit Hours				Number & Code of Pre-requisite	Name of Prerequisite (Co-Requisite)
Course Title			CrH	T	P	Tr		
تطبيقات التقنية الحيوية البيئية Applied environmental biotechnology	466	ENV	2	2	0	0	ENV-464	Genetics
التدريب الميداني Field training	484	ENV	5	0	0	10	ENV-483	Environmental Modeling
مشروع التخرج Graduation Project	485	ENV	3	1	4	0	ENV-483	Environmental Modeling
Elective courses			2	2	0	0	--	--
University elective			2	2	0	0	--	--
University elective			2	2	0	0	--	--
Total			16					