Form: Study Plan- Bachelors	Form Number	EXC-01-03-02A
	Issue Number and Date	2/3/24/2022/2963 2022/12/05
	Number and Date of Revision or Modification	15/10/2023
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	Number of Pages	19

1.	School	Agriculture
2.	Department	Plant Protection
3.	Program title (Arabic)	البكالوريوس في وقاية النبات
4.	Program title (English)	B.Sc. Degree in Plant Protection

5. Components of Curriculum:

The curriculum for the bachelor's degree in Plant Protection consists of (138) credit hours distributed as follows

Number	Type of requirement	credit hours
First	University Requirements	27
Second	Faculty Requirements	24
Third	Department Requirements	87
Total		**138**

6. Numbering System:

A- Department number

Department	Number
Horticulture and Crop Science	1
Animal Production	2
Nutrition and Food Technology	3
Land, Water and Environment	4
Agricultural Economics and Agribusiness Management	5
Plant Protection	6

B- Course number

Domain title	Domain number	Domain title	Domain number
General	0	Honeybee	4
Entomology	1	Pest Control	5
Plant Pathology	2	Training, Research and Seminars	9
Weed Science and its Control	3		

C- Course number consists of 7 digits

Example: General Entomology (0606212)

School		Department		Level	Serial number	
0	**6**	**0**	**6**	**2**	**1**	**2**

First: University Requirements (27 Credit Hours):

a- Compulsory Requirements: 18 Credit Hours

b- Electives: 9 Credit Hours

a- Compulsory Requirements: 18 Credit Hours

No.	Course Title	Course No.	Credit Hours	Pre-requisites
1	Military Sciences	2220100	3	-
2	English Language (Level 3)	3202003	3	3202002
3	National Culture	3400100	3	-
4	Ethics and Social Responsibility	3420100	3	-
5	Entrepreneurship, Innovation and Leadership	3420101	3	-
6	Communication Skills and Soft Skills in English	3420103	3	3202003

b- **Electives: 9 Credit Hours:**

(9) Credit hours to be chosen from the first, second and third groups mentioned below. The student has to choose one course from each of the groups.

Electives: (First Group)				
No.	Course Title	Course No.	Credit Hours	Pre-requisites
1	Environmental Culture and Development	0310102	3	-
2	Islamic Culture	0400102	3	-
3	Health Culture	0720100	3	-
4	Legal Culture	1000102	3	-
5	Physical Fitness Culture	1100100	3	-
6	Introduction to Philosophy and Critical Thinking	3400103	3	-
7	Tourism Culture	3400111	3	-
No.	Course Title	Course	Credit	Pre-

		No.	Hours	requisites
1	Islam and Contemporary Issues	0400101	3	-
2	Social Media	1900101	3	-
3	Appreciation of Arts	2000100	3	-
4	Foreign Language	2200103	3	-
5	Arab-Islamic Civilization	2300101	3	-
6	Jordan: History and Civilization	2300102	3	-
7	Special Subject	3400106	3	-
8	Great Books	3400107	3	-
9	Jerusalem	3400108	3	-
No.	Course Title	Course No.	Credit Hours	Pre-requisites
1	Special Topic in Digital Skills	1900104	3	1900103

Second: General mandatory university requirements

All students admitted to the university must apply for a degree examination in Arabic and English and the computer is prepared or approved by the university to determine their level. Based on the results of the examinations, either the student will study one or more of the requirements of the preparatory program.

(0 - 15 Credit Hours) not included as credit hours

15 Credit Hours				
No.	Course Title	Course No.	Credit Hours	Pre-requisites
1	Community Service	0600150	0	-
2	Computer Skills Placement Test	1902098	0	-
3	Basics of Computing	1932099	3	-
4	Arabic Language (Level 1)	3201001	3	-
5	Arabic Language (Level 2)	3201002	3	3201001
6	English Language (Level 1)	3202001	3	-
7	English Language (Level 2)	3202002	3	3202001
8	Arabic Placement Test	3211098	0	-
9	English Placement Test	3212098	0	-

Second: School courses: distributed as follows:

A. Obligatory school courses: (24) credit hours
B. Elective school courses: (0) credit hours

A. Obligatory school courses: (24) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0301101	Calculus (1)	3	-	3	-
0333106	General Chemistry for Life Sciences	3	-	3	-
0333109	Experimental General Chemistry	1	3	-	0333106 or sim.
0334103	Biology for Life Sciences	3	-	3	-
0304111	Practical General Biology 1	1	3	-	0334103 or sim.

0342103	General Physics for Life Sciences	3	-	3	-
0332113	Experimental General Physics for Life Sciences	1	3	-	0342103 or sim.
0661101	Principles of Plant Production	3	-	3	0334103
0605151	Biostatistics and Data Analysis	3	-	3	1900103
1900103	Modern Digital Skills	3	-	3	1932099

B. Elective school courses: (0) credit hours:

Third: Specialty courses: (87) credit hours distributed as follows:

A. Obligatory specialty courses: (75) credit hours
B. Elective specialty courses: (12) credit hours

A. Obligatory specialty courses: (75) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0333233	Organic Chemistry for non-chemistry students	3	-	3	0303106
0333239	Experimental Organic Chemistry for Non-Chemistry Students	-	3	1	0333233 or Sim
0601250	Principles of Farm Mechanization	3	-	3	0342103
0604104	Principles of Soil and Irrigation	3	-	3	0342103
0605101	Principles of Agricultural Economics	3	-	3	0301101
0601212	Fundamentals of Fruit Trees Production	3	-	3	0661101
0601222	Fundamentals of Vegetable Crops Production	3	-	3	0661101
0606212	General Entomology	2	2	3	0334103
0606213	Economic Entomology	2	2	3	0606212
0606316	Medicinal and Veterinary Entomology	1	2	2	0606212
0636221	Plant Pathology	2	3	3	0334101
0606223	Mycology	2	2	3	0636221
0606323	Plant Fungal Diseases	2	2	3	0606223
0606325	Phytopathogenic Bacteria	2	2	3	0636221
0606326	Plant Viral Diseases	2	3	3	0636221
0606327	Plant Nematology	2	3	3	0636221
0646231	Weed Science	2	2	3	0334103
0606351	Pesticides	2	2	3	0333106
0606417	Insect Taxonomy	2	3	3	0606212
0606418	Insect Ecology	3	-	3	0606212
0606242	Honeybee Keeping	2	3	3	0606212
0656492	Graduation Project in plant protection	-	4	1	*
0662490	Fundamentals of Employment Readiness (Interpersonal Skills and Professional Development- General)	3	-	3	*

0676490	Employment Readiness: Specialized Skills in Plant Protection	3	-	3	*
0666493	Field Practices in Entomology	0	8	2	0606212+ 0606213+*
0666494	Field Practices in Plant Pathology	0	8	2	0636221+ 0606323+*
0666495	Field Practices in Weed Science	0	8	2	0646231+*
0601497	Field Practices in Horticulture and Crops	0	4	1	0661101 *
0604497	Field Practices in land, Water and Environment	0	4	1	0604104 *

* Completion of 110 credit hours successfully and department approval.

B. Elective specialty courses: (12) credit hours: Students select Elective courses from the following groups:

Group 1: Courses from the department (student should study 6 credit hours from this group)

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0606311	General Acarology	2	2	3	0606212
0636317	Pests of Stored Materials	2	2	3	0606212 + 0636221
0636451	Biological Control	2	2	3	0606212 + 0636221
0646331	Parasitic Flowering Plants	2	2	3	0646231
0636419	Insects Vectors of Plant Diseases	2	-	2	0606212
0646423	Beneficial Fungi	2	-	2	0334103
0606428	Epidemiology of Plant Diseases	2	-	2	0636221
0606452	Herbicides	2	2	3	0606351
0606453	Agricultural Quarantine	2	-	2	0606212 + 0636221
0606454	Recent Techniques in Plant Protection	3	-	3	0606212 + 0636221
0606442	Honeybee products	1	2	3	0606242

Group 2: The student should study (3) credit hours

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0641211	Floriculture	2	2	3	0661101
0601232	Field Crops Production Systems	2	2	3	0661101
0601241	Crop Physiology	2	2	3	0661101
0604334	Green Skills and Sustainability	3	-	3	-
0605322	Innovation and Entrepreneurship for Agribusiness	3	-	3	-

Group 3: The student should study (3) credit hours

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0603101	Principles of Food and Nutrition	3	-	3	0334103
0644352	Climate Change	3	-	3	-
0604223	Soil Fertility and Fertilizers	2	3	3	0604104
0634230	Agrometeorology	3	-	3	-
0605260	Agricultural Extension	3	-	3	-
0635230	Agricultural Marketing	3	-	3	0605101
0602101	Principles of Animal Production	3	-	3	0334103

Fourth: Courses offered by other faculties/schools and departments

Course Number	Course Name	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0301101	Calculus (1)	3	-	3	-
0333106	General Chemistry for Life Sciences	3	-	3	-
0333109	Experimental General Chemistry for non-Chemistry Students	-	3	1	0333106 or sim.
0334103	General Biology for life Sciences	3	-	3	-
0304111	Experimental General Biology (1)	-	3	1	0334103or sim.
0342103	General Physics for Life Sciences	3	-	3	-
0302113	Experimental General Physics for life Sciences	-	3	1	0342103 or sim.
0661101	Principles of Plant Production	3	-	3	0334103
0605151	Biostatistics and Data Analysis	3	-	3	1900103
1900103	Modern Digital Skills	3	-	3	1932099
0333233	Organic Chemistry for non-Chemistry Students	3	-	3	0333106
0303239	Experimental Organic Chemistry for non-Chemistry Students	-	3	1	0333233 or sim.
0601250	Principles of Farm Mechanization	3	-	3	0342103
0604104	Principles of Soil and irrigation	3	-	3	0342103
0605101	Principles of Agricultural Economics	3	-	3	0301101
0601212	Fundamentals of Fruit Trees Production	3	-	3	0661101
0601222	Fundamentals of Vegetable Crops Production	3	-	3	0661101
0601497	Field Practices in Horticulture and Crops	0	4	1	0661101 *
0604497	Field Practices in land, water and environment	0	4	1	0604104 *
0662490	Fundamentals of Employment Readiness (Interpersonal skills and professional Development- General)	-	6	3	*
0641211	Floriculture	2	2	3	0661101
0601232	Field Crops Production Systems	2	2	3	0661101
0601241	Crop Physiology	2	2	3	0661101
0604334	Green Skills and Sustainability	3	-	3	-
0605322	Innovation and Entrepreneurship for Agribusiness	3	-	3	-

0603101	Principles of Food and Nutrition	3	-	3	0334103
0644352	Climate Change	3	-	3	-
0604223	Soil Fertility and Fertilizers	2	3	3	0604104
0634230	Agrometeorology	3	-	3	-
0605260	Agricultural Extension	3	-	3	-
0635230	Agricultural Marketing	3	-	3	0605101
0602101	Principles of Animal Production	3	-	3	0334103

* Completion of 110 credit hours successfully and department approval.

Fifth: The Guiding/Annual Plan

First Year

Fall			**Spring**		
Course Number	**Course Name**	**Credit Hours**	**Course Number**	**Course Name**	**Credit Hours**
0333106	General Chemistry for Life Sciences	3	0301101	Calculus (1)	3
0333109	Experimental General Chemistry for non-Chemistry Students	1	0342103	General Physics for Life Sciences	3
0334103	General Biology for Life Sciences	3		University requirement compulsory	3
0304111	Experimental General Biology (1)	1	1900103	Modern Digital Skills	3
	Compulsory University Requirement	3	0605151	Biostatistics and Data Analysis	3
	Elective University Requirement	3	0661101	Principles of Plant Production	3
0302113	Experimental General Physics for life Sciences	1			
Fall Total		**15**	**Spring Total**		**18**
Summer			Compulsory University Requirement		**3**
			Elective University Requirement		**3**
Summer Total		**6**	**Academic Year Total**		**39**

Second year

Fall			**Spring**		
Course Number	**Course Name**	**Credit Hours**	**Course Number**	**Course Name**	**Credit Hours**
0606212	General Entomology	3	0601250	Principles of Farm Mechanization	3
0636221	Plant Pathology	3	0604104	Principles of Soil and Irrigation	3
	Department Requirement\ Elective	3	0606213	Economic Entomology	3
0605101	Principles of Agricultural Economics	3	0601212	Basics of Fruit Trees	3
0601222	Basics of Olericulture	3	0333233	Organic Chemistry for non-Chemistry Students	3
Fall Total		**15**	**Spring Total**		**15**

Summer		Compulsory University Requirement	**3**
		Elective University Requirement	**3**
		Experimental Organic Chemistry for non-Chemistry Students (0303239)	**1**
Summer Total	**7**	**Academic Year Total**	**37**

Third year

Fall			**Spring**		
Course Number	**Course Name**	**Credit Hours**	**Course Number**	**Course Name**	**Credit Hours**
0606223	Mycology	3	0606325	Phytopathogenic Bacteria	3
0606323	Plant Fungal Diseases	3	0606327	Plant Nematology	3
0606351	Pesticides	3	0606231	Weed Science	3
0606326	Plant Viral Diseases	3	606316	Medicinal and Veterinary Entomology	2
	Compulsory University Requirement	3		Department Requirement Elective	3
			0606242	Honeybee Keeping	
Fall Total		**15**	**Spring Total**		**17**
Summer			Department Requirement Elective		3
			Compulsory University Requirement		3
Summer Total		**6**	**Academic Year Total**		**38**

Fourth Year

Fall			**Spring**		
Course Number	**Course Name**	**Credit Hours**	**Course Number**	**Course Name**	**Credit Hours**
0666493	Field Practices in Plant Protection – Entomology	2	0606418	Insect Ecology	3
0666494	Field Practices in Plant Protection – Plant Pathology	2	0606417	Insect Classification	3
0666495	Field Practices in Plant Protection – Weed	2		Department Requirement Elective	3
0601497	Field Practices in Horticulture and Crops	1	0656492	Graduation Project in plant Protection	1
0604497	Field Practices in land, water and environment	1			
	Fundamentals of Employment Readiness (Interpersonal skills and professional Development-General) (0662490)	3			
	Employment Readiness: Specialized Skills in Plant Protection (0676490)	3			
Fall Total		**14**	**Spring Total**		**10**
Summer Total		**-**	**Academic Year Total**		**24**

Course Description

(0) General

Course Number: 0606101	Course Title: Principles of Plant Protection	Type of learning: online	Credit Hours: 3
Prerequisite: (0334103)			
Description: The student will study various plant pests, selected examples of economic disease-causing agents and insect pests in Jordan, their classification, symptoms of infection, nature of the damage, plant hosts, and timing of infection occurrence, methods of spread, and practical control methods.			

(1) Entomology

Course Number: 0606212	Course Title: General Entomology	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0334103)			
Description: The student will study the taxonomic classification of insects within the animal kingdom and their relationship to arthropods, the external structure of insect parts and their functions, the internal anatomy of systems and their functions, the identification of insect orders of economic importance, as well as insect behaviour and their relationship with plants, animals, humans, and the environment.			
Course Number: 0606213	Course Title: Economic Entomology	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606212)			
Description: Students will learn identification of insects and mite pests; damage and symptoms on vegetables and fruit trees; life cycles; geographical distribution of pests, and control of economic pests. Expert people will be invited to give students lectures or a variety of interactive activities.			
Course Number: 0606316	Course Title: Medicinal and Veterinary Entomology	Type of learning: blended	Credit Hours: 2
Prerequisite: (0606212)			
Description: Students will learn the fundamental of medical and veterinary entomology, its aim is to provide basic information on the identification, biology, habits, medical importance and control of insects important in the health and well-being of man and animals.			
Course Number: 0606417	Course Title: Insect Classification	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606212)			
Description: Students will learn principles of insect classification, identification of insect orders and families. Study of life cycle, habitats, habits, adaptations to the environment. Methods of collecting, preserving and identification of insects using taxonomic keys. Expert people will be invited to give students lectures or a variety of interactive activities.			
Course Number: 0606418	Course Title: Insect Ecology	Type of learning: online	Credit Hours: 3
Prerequisite: (0606212)			
Description: Students will learn population ecology and applied ecology. It deals with elementary concepts of insect ecology, the various factors regulating abundance and distribution of insect populations, the tritrophic relationship between host plants/herbivores /natural enemies, and the applied aspects of insect ecology in plant protection.			
Course Number: 0606311	Course Title: General Acarology	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606212)			
Description: The student will study the basics of acarology, the relationship of mites with humans, plants, and animals, distinguishing mites from other arthropods, principles of mite classification, studying the external structure and internal systems and their functions, the environment of mites, and methods of controlling them.			
Course Number: 0636317	Course Title: Pests of Stored Materials	Type of learning: blended	Credit Hours: 3
Prerequisite: (0606212 + 0636221)			

Description: The student will study insect, mite, and animal pests, as well as the pathogens that attack stored materials, focusing on different types of insects and their morphological characteristics, symptoms of infestation, damage, life cycles, the environment of harmful insects, and pathogens, whether fungal, bacterial, or others. The course will also cover diagnosing these pathogens, along with biological, environmental, and epidemiological information related to them, and methods for controlling these pests.			
Course Number: 0636419	Course Title: Insects Vector of Plant Diseases	Type of learning: blended	Credit Hours: 2
Prerequisite: (0606212)			
Description: Students will learn arthropods especially insects and insect's role in plant disease transmission, their economic importance and their control.			

(2) Plant Pathology

Course Number: 0636221	Course Title: Plant Pathology	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0334103)			
Description: The student will study the basics of plant pathology, types of disease-causing agents, the disease life cycle, mechanisms of disease development, symptoms of infection, plant defence mechanisms, examples of major plant diseases, and control methods.			
Course Number: 0606223	Course Title: Mycology	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0636221)			
Description: The student will study fungi in terms of their characteristics, reproduction, and economic importance, as well as their classification into groups based on their forms and structures. The course includes detailed examples of economically important fungi, both beneficial and harmful. The practical part of the course involves laboratory study of key fungi belonging to different groups, focusing on their various forms and structures. Experts will be invited to provide lectures or lead interactive activities for the students.			
Course Number: 0606323	Course Title: Plant Fungal Diseases	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606223)			
Description: The student will study the fundamentals of plant pathology caused by fungi, which affect certain vegetables, field crops, fruit trees, forests, and economically important ornamental plants in terms of the causal agent, symptoms and characteristics, pathological signs of each disease, the life cycle of the pathogen, and various prevention and control methods.			
Course Number: 0606325	Course Title: Phytopathogenic Bacteria	Type of learning: blended	Credit Hours: 3
Prerequisite: (0636221)			
Description: The student will study the fundamentals of bacteriology in terms of shape, structure, and reproduction, the bacterial genera that cause plant diseases, modern methods for classifying and identifying them, the diseases resulting from them, their symptoms, epidemiology, and control methods. Experts will be consulted to give students lectures or varied interactive activities.			
Course Number: 0606326	Course Title: Plant Viral Diseases	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0636221)			
Description: Students will learn principles of virology, morphology structure, replication and spread of viruses: techniques and methods in virus isolation, purification and characterization of viruses. Experts people will be invited to give students lectures or a variety of interactive activities.			
Course Number: 0606327	Course Title: Plant Nematology	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0636221)			
Description: Students will learn the basic principles of nematology; involving the morphology, biology, host-parasite relationship, and management of phytonematodes. This course also covers individual			

nematodes of significant economic importance from various nematode taxa. The laboratory part includes isolation and identification of phytonematodes. Expert people will be invited to give students lectures or a variety of interactive activities.			
Course Number: 0606423	Course Title: Beneficial Fungi	Type of learning: face-to-face	Credit Hours: 2
Prerequisite: (0334103)			
Description: Students will learn the different beneficial aspects of fungi in different disciplines such as food (mushrooms and single cell protein), industry, medicine, biochemistry and genetics, bioremediation, as endophytes in plants, and as mutualistic with plants and animals, and as biocontrol agents. Mushrooms will be studied in detail: biology, cultivation, collecting, and nutritional and medicinal values.			
Course Number: 0606428	Course Title: Epidemiology of Plant Diseases	Type of learning: blended	Credit Hours: 2
Prerequisite: (0636221)			
Description: Students will learn the basic principles of epidemiology, involving patterns and dynamics of epidemics, inoculum potential, dispersal of inoculum, environmental factors affecting epidemics of diseases, and management strategies of diseases.			

(3) Weed Control

Course Number: 0646231	Course Title: Weed Science	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0334103)			
Description: The student will study various aspects of the life and environment of weeds, their different classifications, the most important weeds found in Jordan, as well as the interactions of harmful weeds (competition and inhibition), their economic importance, and various control methods.			
Course Number: 0646331	Course Title: Parasitic Flowering Plants	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0646231)			
Description: Students will learn about parasitic flowering plants and their distribution worldwide, their impact on their hosts, especially on the strategic crops. Physiology of parasitism, growth of the parasitic plants, means of management, with emphasis on parasitic plants in Jordan. The course includes conducting some laboratories, field study cases, literature surveys and presentation of research papers.			
Course Number: 0606452	Course Title: Herbicides	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606351)			
Description: Students will learn herbicides with respect to their nomenclature, categories, formulations and their chemical groups, applications, and safe use. It also provides the mode of actions, resistance to herbicide, and impact on the environment.			

(4) Honeybee

Course Number: 0606242	Course Title: Honeybee Keeping	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606212)			
Description: Students will learn beekeeping past and present. Honeybee relatives and social life. Honeybee colony, castes, morphology, anatomy, activities, and communication. Colony nutrition, diseases, and pests. Hive products. Beekeeping equipment.			
Course Number: 0606442	Course Title: Honeybee products	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606242)			
Description: The student will study everything related to establishing an apiary, honey bee plants, plant			

pollination, seasonal care, the reproductive system of the honeybee queen, worker, and drone, honey bee queen production, artificial insemination of the queen, production and marketing of honey and royal jelly, therapy using bee venom, production of pollen, beeswax, and propolis.

(5) Pest Control

Course Number: 0606351	Course Title: Pesticides	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0333106)			
Description: The student will study pest control pesticides and their importance in pest management, focusing on different pesticide groups in terms of their names, chemical composition, properties, formulations, usage, and application methods. The course will also cover spraying equipment and calibration, with an emphasis on the safe use of pesticides, regulations, and pesticide registration. Experts will be invited to provide lectures or lead interactive activities for the students.			
Course Number: 0606451	Course Title: Biological Control	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606212 + 0636221)			
Description: The student will study the general concept of biological control, including the history of traditional biological control, which involves the introduction of natural enemies (parasites, predators, and pathogens) to combat pests such as insects, mites, and weeds. The course will address the problems associated with the use of chemical pesticides and their harmful effects on the environment. It will also include the identification of different insect orders and families that contain biological control agents, as well as case studies where natural enemies have been successfully used in pest control programs.			
Course Number: 0606453	Course Title: Agricultural Quarantine	Type of learning: blended	Credit Hours: 2
Prerequisite: (0606212 + 0636221)			
Description: Students will learn the principles of agricultural quarantine. The student will be exposed to phytosanitary terms, plant inspection and sampling consignments, surveillance of pests, pest risk analysis, certification of plant material, diagnosis of selected quarantine pests, international movement of seeds, wood, plant growing media, used vehicles, machinery and equipment.			
Course Number: 0606454	Course Title: Recent Techniques in Plant Protection	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: (0606212 + 0636221)			
Description: Students will learn plant pathogens identification, epidemiology, control, and management using advance techniques. Examples are: (i) using molecular approaches in pathogen's identification and optimizing the integrated use of agrochemicals with crop varieties of differing genetic background, (ii) using beneficial endophytes to enhance crop protection (iii) developing synergistic mixes and formulations of pesticides and identifying novel bioactive natural products and control agents (iv) using advanced breeding techniques including agricultural biotechnology to introduce insect and disease resistance into major crop plants, (v) modelling and forecasting of crop pest epidemics and disease outbreaks, and (vi) using anti-feeding materials, repellents, and sterilizing insects with radiation.			

(6) Training, research and Graduation Project

Course Number: 0656492	Course Title: Graduation Project in Plant Protection	Type of learning: blended	Credit Hours: 1
Prerequisite: Completion of 110 credit hours successfully and department approval.			
Description: Students will learn carrying out an experiment or more about a pest (insect or pathogen), analyse data and present it in suitable tables, figures and charts, and to discuss the results according to published literature, and finally submit a report to the advisor containing the main components of a manuscript.			
Course Number: 0666493	Course Title: Field Practices in Entomology	Type of learning: face-to-face	Credit Hours: 2
Prerequisite: (0606212+0606213) Completion of 110 credit hours successfully			

Description: Students will learn identification and diagnosing of crop pests (insects and mites); practical application of pest control and integrated pest management.			
Course Number: 0666494	Course Title: Field Practices in Plant Pathology	Type of learning: face-to-face	Credit Hours: 2
Prerequisite: (0636221+0606323) Completion of 110 credit hours successfully			
Description: Students will learn identification and diagnosing of crop diseases caused by fungi, nematodes, bacteria and viruses, practical application of pest control and integrated pest management.			
Course Number: 0666495	Course Title: Field Practices in Weed Science	Type of learning: face-to-face	Credit Hours: 2
Prerequisite: (0646231) Completion of 110 credit hours successfully			
Description: Students will learn to identify weeds, understand their ecology and economic importance, and explore management strategies in open fields, greenhouses, and orchards.			
Course Number: 0606497	Course Title: Field Practices in Plant Protection	Type of learning: face-to-face	Credit Hours: 1
Prerequisite: 0606101 and to successfully pass 110 credit hours with department approval			
Description: This course aims to train the students and to develop their skills in identifying, diagnosing and studying main insect, pests, plant pathogens, diseases and major weeds species in terms of symptoms of infection, economic importance, methods of prevention, control and management in open field, protected greenhouses and fruit tree orchards.			
Course Number: 0601497	Course Title: Field Practices in Horticulture and Crops	Type of learning: face-to-face	Credit Hours: 1
Prerequisite: (0661101) Completion of 110 credit hours successfully			
Description: The course primarily means providing the student with basic practical skills in the agricultural field, specifically in the field of vegetables, fruits and crops. It also works to break the barrier between the student and the field and between theoretical and applied information. The student is exposed to the application of miniature models of what the farmer does in his field, such as multiplying vegetables, cultivating the land, planting seeds and seedlings in the open field and greenhouses, and working to track the crop service from planting to the stage of harvesting. Training on the mechanism of dismantling and installing greenhouses and tunnels, grafting seedlings, planting and serving different field crops, identifying and serving different fruit trees, and identifying the mechanism of applying good agricultural practices in the field, reducing post-harvest losses, inferring the components of the quality of ripe fruits and preparing the product for marketing.			
Course Number: 0604497	Course Title: Field Practices in land, Water and Environment	Type of learning: face-to-face	Credit Hours: 1
Prerequisite: (0604104) Completion of 110 credit hours successfully			
Description: Students will learn the production and maintenance of major and secondary cut flowers, flowering and foliage pot plants, bulbous plants, bedding plants, hanging baskets, trees, shrubs, hedges, other ornamentals, turf grass establishment and maintenance.			

(7) Employment Readiness

Course Number: 0662490	Course Title: Fundamentals of Employment Readiness (Interpersonal Skills and Professional Development- General)	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: Minimum completion of 110 credit hours successfully, in addition to the department approval.			
Description: This course aims to help students acquire the skills, experiences and competencies necessary to enter the labour market efficiently, and to make graduates distinguished in their professional fields and able to solve the problems they face by providing them with the skills and competencies required for the labour market. The course will focus on enhancing the technical, professional and personal capabilities of students while discussing the concepts of leadership, creativity, innovation, productivity, administrative hierarchy and capacity development. The course also includes a description of the local and regional labour			

market and the jobs available for the academic program, with an introduction to the laws, regulations and legislation in force related to the profession, in addition to presenting the reality of graduates of the School of Agriculture in general. The course characterized by giving an effective role to experts and pioneers from the public and private sectors to meet with students to discuss the work environment and job requirements in the major, in addition to presenting their experiences in their respective fields.			
Course Number: 0676490	Course Title: Employment Readiness: Specialized Skills in Plant Protection	Type of learning: face-to-face	Credit Hours: 3
Prerequisite: Minimum completion of 110 credit hours successfully, in addition to the department approval.			
Description: This course aims to equip students with the essential skills and knowledge needed to pursue professional pathways in the field of plant protection. It combines theoretical knowledge with practical exercises, current studies, and field insights to provide a comprehensive learning experience that contributes to sustainable agriculture. The main skills covered include: 1. Education and Training: Acquiring appropriate education in plant diseases, entomology, weed science, and pest management. 2. Technical Skills: Developing expertise in identifying pests and diseases, demonstrating the application of various pest management methods, such as biological control agents or agricultural practices, and creating a pest management plan for a specific crop while considering factors such as pest and disease life cycles, crop stages, and environmental impact. 3. Communication and Collaboration: Enhancing effective communication skills with peers, farmers, researchers, and stakeholders, and collaborating with interdisciplinary teams to address plant health challenges. 4. Environmental Awareness: Understanding the connection between plant health and the well-being of humans, animals, and ecosystems, and balancing agricultural needs with environmental sustainability. 5. Regulatory Knowledge: Understanding the regulations and policies related to plant protection and recognizing import/export requirements and risk assessment. 6. Problem Solving and Decision Making: Developing critical thinking skills to diagnose plant health issues and propose effective solutions, while enhancing adaptability to climate change and emerging threats. 7. Work Ethics: Understanding the essential ethics for success in plant protection. The course will include hosting experts to evaluate students' mastery of the skills and competencies required for the job market in plant protection. At the end of the semester, students will be required to present a graduation project that involves data collection, conducting studies, and presenting results to experts, along with an assessment of their readiness for the job market and their ability to perform essential tasks related to the required competencies in the specialization.			

(8) Courses offered by other faculties and departments

Course Number: 0301101	Course Name: Calculus (1)	Type of learning: face-to-face	Credit Hours: 3
Pre-requisite: - (-)			
Description: Functions: domain, operations on functions, graphs of functions; trigonometric functions; limits: meaning of a limit, computational techniques, limits at infinity, infinite limits ;continuity; limits and continuity of trigonometric functions; the derivative: techniques of differentiation, derivatives of trigonometric functions; the chain rule; implicit differentiation; differentials; Roll's Theorem; the mean value theorem; the extended mean value theorem; increasing and decreasing functions; concavity; maximum and minimum values of a function; graphs of functions including rational functions (asymptotes) and functions with vertical tangents (cusps); antiderivatives; the indefinite integral; the definite integral; the fundamental theorem of calculus ; the area under a curve; the area between two curves; transcendental functions: inverse functions, logarithmic and exponential functions; derivatives and integrals; limits (the indeterminate forms); hyperbolic functions and their inverses; inverse trigonometric functions; some techniques of integration.			
Course Number: 0333106	Course Name : General Chemistry for Life Science	Type of learning: face-to-face	Credit Hours: 3
Pre-requisite: - (-)			
Description: This course covers basic topics including: The scientific method, measurements and significant			

figures, units and dimensional analysis, naming simple inorganic compounds, stoichiometry, basic reactions in aqueous solutions and solution stoichiometry, properties of gases and kinetic molecular theory, measurements and calculations of energy associated with physical changes and chemical reactions, basic quantum theory and the electronic structure of the atoms, atomic periodic properties, ionic bonding, covalent bonding, molecular geometry, and hybridization of atomic orbitals.			
Course Number: 0333109	Experimental General Chemistry for non-Chemistry Students	Type of learning: face-to-face	Credit Hours: 1
Pre-requisite: - (0333106 or Sim.)			
Description: Safety and laboratory rules; chemical observations; Avogadro's number; stoichiometry; volumetric analysis; oxidation and reduction; colligative properties; thermochemistry and equilibrium.			
Course Number: 0334103	Course Name : General Biology for Life Sciences	Type of learning: face-to-face	Credit Hours : 3
Pre-requisite: - (-)			
Description: This course covers the fundamental principles of biology, focusing on the chemical basis of life, cell structure and function, energy transformations, and cellular processes. The course provides a comprehensive overview of biological concepts and processes, preparing students for advanced study in agricultural sciences.			
Course Number: 0304111	Course Name : Experimental General Biology (1)	Type of learning: face-to-face	Credit Hours : 1
Pre-requisite: - (0334103 or Sim.)			
Description: Laboratory experiments in microscopy and cells, chemical aspects of cells, plant and animal issues, animal and plant physiology. Mammalian anatomy, and systematic of major living groups.			
Course Number: 0342103	Course Name : General Physics for Life Sciences	Type of learning: face-to-face	Credit Hours : 3
Pre-requisite: -			
Description: Motion in a straight line, motion in two dimensions, newton's laws of motion, statics, work, energy, and power, linear momentum, temperature and the behaviour of gases, thermodynamics, thermal properties of matter, electric forces, electric fields, electric potentials, direct currents.			
Course Number: 0302113	Course Name : Experimental General Physics for life Sciences	Type of learning: face-to-face	Credit Hours : 1
Pre-requisite: - 0342103 or Sim.			
Description: Students perform 11 experiments of 3 hrs/week duration. These experiments are out of the following: Collection and Analysis of Data; Measurements and Uncertainties; Vectors: Force Table; Newton's 2nd Law of Motion; Simple Harmonic Motion: Simple Pendulum; The Falling Sphere Viscometer; The Laws of Gases; Measurement of Resistance; The Potentiometer; Specific Charge of Copper Ions; Introduction to the Oscilloscope; Joule Heat; Lenses.			
Course Number: 0333233	Course Name: Organic Chemistry for non-Chemistry Students	Type of learning: face-to-face	Credit Hours: 3
Pre-requisite: - (0333106)			
Description: Hydrocarbons: alkanes, cycloalkanes, alkenes, alkynes; aromatic compounds; stereochemistry; halides; alcohols; phenols; ethers; amines; carbonyl compounds and carboxylic acids.			
Course Number: 0333239	Course Name : Experimental Organic Chemistry for non-Chemistry Students	Type of learning: face-to-face	Credit Hours : 1
Pre-requisite: - (0333233 or Sim.)			
Description: The course involves separation, purification of and identification organic compounds through their physical properties: melting point, distillation, crystallization, extraction, and chromatography; preparation of simple organic compounds; qualitative tests for selected classes of organic compounds.			
Course Number: 0661101	Course Name: Principles of Plant Production	Type of learning: face-to-face	Credit Hours : 3
Pre-requisite: - (0334103)			

Description: Students will learn the importance of the plant production systems in achieving global food security. Major horticultural and field crops, their divisions, composition, growth, development, reproduction, and their appropriate environment for cultivation. An overview of major production practices, propagation, mineral nutrition, breeding and pruning, growth and development regulation and plant production systems for major agricultural crops.			
Course Number: 0605151	Course Name: Biostatistics and Data Analysis	Type of learning: face-to-face	Credit Hours: 3
Pre-requisite: - (1900103)			
Description: Study the basic concepts of statistics and the methods used in data collection, analysis and presentation, especially in agriculture. To describe basic principles of data analysis, methods for calculating some statistical measures such as measures of central tendency and dispersion. The concept of simple linear correlation and regression as a method for measuring the relationship between two phenomena. Distinguishing between quantitative and descriptive variables and providing the student with the ability to address some of the problems that they encounter in their working lives in a scientific manner based on a scientific method.			
Course Number: 1900103	Course Name: Modern Digital Skills	Type of learning: face-to-face	Credit Hours: 3
Pre-requisite: - (1932099)			
Description: This course aims to enhance the students' digital knowledge and skills, placing a spotlight on Artificial Intelligence (AI) and cutting-edge digital technologies, to equip them for current and future jobs. The course allows participants to learn the foundations of the digital world and enable them to better utilize technology to advance their careers. The course material includes, but is not limited to: types of data, information, and content; digital identity; digital content creation in all forms; cyber security and safety; collaborating and working online; global trends and technologies such as Big Data, Cloud Computing, Artificial Intelligence, Internet of Things, Gamification; Balanced use of technology and social media; and digital career competencies needed in the current job market. Aligned with Education for Sustainable Development (ESD) and Sustainable Development Goals (SDGs), it instils responsibility for inclusive and sustainable practices in the digital era. As the digital landscape evolves, the course content is continuously updated to keep students well-prepared and informed about emerging digital technologies shaping the future. The course employs experiential and active learning methods, including interactive lectures, collaborative activities, and the use of digital tools. Assessment methods include exams, assignments, practical tasks and the integration of professional certifications, providing students with hands-on experience and industry recognized credentials that enhance their career prospects.			
Course Number: 0601250	Course Name : Principles of Farm Mechanization	Type of learning: online	Credit Hours : 1
Prerequisite: 0342103			
Description: Basic mechanical principles and definitions, fluid power, hydraulic systems and their components. Power for agricultural machines and the principles of its transmission. Agricultural tractor, configurations, components and their systems of operation. Conventional and unconventional soil tillage systems and soil preparation equipment. Planting and fertilizing equipment: types and systems of function. Crop protection equipment: types, operation and calibration. Harvesting equipment: forage making and harvesting equipment, grain harvesting equipment, root-harvesting equipment. Machinery exploitation and management in agricultural operations.			
Course Number: 0604104	Course Name : Principles of Soil Science and Irrigation	Type of learning: face-to-face	Credit Hours : 3
Prerequisite: 0342103			
Description: Definition of soil and soil formation factors. Chemical and biological properties of soil. Soil fertility and major and minor elements needed for plant growth. Irrigation and drainage science, mathematical relationships of soil moisture and density, water quantity calculations, plant water needs, irrigation scheduling, irrigation methods (surface, sprinkler and drip irrigation), losses in the irrigation process, types and calculation of irrigation efficiency.			
Course Number: 0605101	Course Name : Principles of Agricultural Economics	Type of learning: face-to-face	Credit Hours : 3

Pre-requisite: - (0301101)			
Description: Economic concepts, resources and systems, analysis of input-output, input-input, and output-output relationships, analysis of costs of production, input and output decisions of agricultural firms, demand and supply and their related elasticities, market equilibrium, determination of prices and quantities, and types of markets. Basic agricultural economic concepts concerning resource use, price determination, and profit maximization are emphasized.			
Course Number: 0601212	Course Name: Fundamentals of Fruit Trees Production	Type of learning: face-to-face	Credit Hours : 3
Prerequisite: 0661101			
Description: Students will learn the importance of fruit trees, their classification, orchard establishment (site selection, rootstocks, cultivars, planting systems, and frost protection), flowering, fruit set, fruit drop, fruit growth and maturation, main cultural practices: pruning and training systems, fruit thinning, fertilizer application, irrigation, and pest control), harvesting and handling, and use of plant growth regulators.			
Course Number: 0601222	Course Name: Fundamentals of Vegetable Crops Production	Type of learning: face-to-face	Credit Hours : 3
Prerequisite: 0661101			
Description: Students will learn with the principles of production of vegetables crops, their importance, classification, proper environmental conditions suitable for their growth, different cultural practices for their production, flowering, fruiting, maturity, harvesting and storage.			
Course Number: 0641211	Course Name: Floriculture	Type of learning: face-to-face	Credit Hours : 3
Prerequisite: 0661101			
Description: Students will learn the production and maintenance of major and secondary cut flowers, flowering and foliage pot plants, bulbous plants, bedding plants, hanging baskets, trees, shrubs, hedges, other ornamentals, turf grass establishment and maintenance.			
Course Number: 0601232	Course Name : Forage crops production systems	Type of learning: blended	Credit Hours : 3
Prerequisite: 0661101			
Description: Students will learn the role of forages in a productive and sustainable agriculture production systems. Identify the major forage crops and develop an understanding of the principle of sound forage crop management, including harvesting, utilization and management. Also, it explains how management affects growth, stand persistence, and physiological changes of forage crops and the interaction with environments.			
Course Number: 0601241	Course Name: Crop Physiology	Type of learning: face-to-face	Credit Hours : 3
Prerequisite: 0661101			
Description: Students will learn the control of main crop physiological processes in relation to genetic, enzymatic, hormonal and phytochrome systems. Crop water status, nutrition and energy metabolism in relation to yield. Photosynthesis, transport, and accumulation of photosynthates. Use of plant growth regulators in agriculture. Crop growth and development in relation to environment. Stresses and their effects on crop growth, adaptations, and acclimatization.			
Course Number: 0604334	Course Name: Green Skills and Sustainability	Type of learning: face-to-face	Credit Hours : 3
Pre-requisite: -			
Description: Throughout this course, the students' skills and knowledge in sustainability and green skills will be expanded to build more sustainable practices in the land, water, plant and animal husbandry sectors. Students will learn how to identify sustainability issues, conduct environmental surveys, restore habitats, and understand conservation methods. The course combines academic studies with practical learning in a variety of settings, providing learners with real-world experience. The course will also cover topics such as carbon neutrality, working towards net zero, and how to increase sustainability in agriculture and the environment. Emphasis will be placed on promoting low-carbon technology to help advance education in agricultural areas and create a new understanding of a sustainable future. The agricultural sustainability management approach will contribute to future options for addressing environmental and sustainability issues within the Sustainable Development Goals.			

Course Number: 0605322	Course Name: Innovation and Entrepreneurship for Agribusiness	Type of learning: face-to-face	Credit Hours : 3
Pre-requisite: -			
Description: This course aims to introduce students to the concepts of innovation and entrepreneurship and provide them with the basic knowledge and skills to develop ideas into viable projects in the agricultural sector. This course also uses theoretical and practical methodologies to train students and prepare them to discover opportunities and unleash their energies in this field. It includes the following topics: culture and systems of innovation and creative thinking, entrepreneurship and its modelling, management of agricultural projects and small companies, social entrepreneurship, intellectual property, technology marketing and sources of funding. Success in this course requires students to develop a business plan for a new viable project or idea.			
Course Number: 0603101	Course Name: Principles of Food and Nutrition	Type of learning: face-to-face	Credit hours: 3
Pre-requisite: - (0334103)			
Description: Introduction to the nutrients with respect to classification; dietary sources, functions and body requirements, the concept of balanced diet; the aetiology and management of malnutrition. Introduction to types and causes of food spoilage, food preservation, and food-borne diseases, emphasizing the status of nutrition and food industries in Jordan.			
Course Number: 0644352	Course Name: Climate Change	Type of learning: face-to-face	Credit hours: 3
Prerequisite:			
Description: Students will learn the physics of the atmosphere and climate indices around the globe, patterns of climate environmental change, and their assessment. Introduction to climate modelling and climate data, climate change scenarios and climate change impacts on water resources, rainwater distribution, soil erosion, floods, forest fires and effects on agricultural production, the economics and technology of climate change, and carbon emissions. Among some of the technologies and practices are advanced low-energy desalination systems, rainwater traps, sustainable irrigation and soil reforming for sustainable agriculture, techniques to reduce greenhouse gas emissions in meat and protein production, microalgae farming for food and fuels, carbon capture and sequestration technologies in power plants. Students will learn how to analyse emerging innovative technologies and practices, how to assess their climate change, recommendations to facilitate their implementation, and how to use green and social financial instruments to decrease community vulnerabilities and increase climate change resilience. Students also assess community vulnerabilities and recommend risk reduction technologies and practices to increase resilience. Additionally, students learn how to monetize environmental and social benefits for each technology or sustainable practice, green financing mechanisms; carbon offset exchanges, and some government grants to fund their implementation in the community. Expert people will be invited to give students lectures or a variety of interactive activities.			
Course Number: 0604223	Course Name: Fertilizers and Soil Fertility	Type of learning: blended	Credit hours: 3
Prerequisite: 0604101			
Description: Students will be introduced to historical developments of the concepts of soil, soil fertility and plant nutrition (Early Greeks, Muslims and Arabs, and Reconnaissance: names and achievements). Concepts of soil fertility and land productivity. Soil properties of relation to fertility. Factors affecting fertility: Soil moisture and salinity, irrigation scheduling and measurement of matric and osmotic soil potentials, light intensity, soil temperature, atmospheric CO_2 concentration, and farm management. Macro- and micro-nutrients: their sources, interactions with other soil components, availability, chemical forms available for root uptake, Symptoms of nutrients deficiency or toxicity. Organic and inorganic fertilizers: methods of manufacturing, their classifications, bioavailability, methods of application and their impact on the environment. Students will be able to identify factors limiting plant growth and crop yield, as well as the major biological, physical, and chemical processes that provide plants by all growth and yield components. There will be a weekly lab covering major course topics and ending by a final lab exam. Some numerical problems and case reports will be requested on weekly basis. Students will also be offered sites for some scientific and educational videos to watch.			
Course Number:	Course Name: Agrometeorology	Type of learning: face-to-	Credit hours: 3

0634230		face	
Prerequisite: -			
Description: This course is an Introductory agricultural meteorology category for the undergraduate level. It introduces the definitions of agrometeorology, its importance, and its scope. It comprises the physics of the atmosphere with emphasis on laws of radiation, solar and terrestrial radiation, surface and atmospheric energy balances, heat budgets, precipitation formation, and atmospheric spheres. It is designed to provide comprehensive knowledge of agrometeorological variables and their measurements which will provide the students with the knowledge of Elements and factors of climate and Weather by focusing on winds, cloud formation, stability, precipitation processes, weather systems, and severe weather phenomena. The course covers the Role of weather in determining risks and hazards and the use of weather data in planning and decision-making and discusses techniques of weather forecasting. The course emphasizes on understanding the world climate drivers, monsoons and global circulations then explain the climate indices of Jordan. It analyses the meteorological data, their presentation, and the main statistical metrics used. The course provides information about climatic classification and its application and effects in agriculture and how to manage severe weather conditions on agriculture.			
Course Number: 0605260	Agricultural Extension	Type of learning: online	Credit hours: 3
Prerequisite:			
Description: Development, objectives, philosophy of agricultural extension, and role of extension in the process of agricultural and rural development and factors affecting its effectiveness are explored. Communication process, extension methods, dissemination and adoption process, planning and evaluation of extension programs, systems and approaches of extension, and development of agricultural extension in Jordan are covered. Experts people will be invited to give students lectures or a variety of interactive activities.			
Course Number: 635230	Course Name : Agricultural Marketing	Type of learning: blended	Credit Hours : 3
Pre-requisite: 0605101			
Description: The concept and functions of agricultural marketing, methods of determining prices, estimating marketing margins, marketing channels, factors affecting prices and marketing channels, marketing institutions, and methods of conducting marketing studies. The course deals with the various trading activities that affect the sales of products in the food marketing system, and those that occur in retail stores.			
Course Number: 0602101	Course Name : Principles of Animal Production	Type of learning: face-to-face	Credit Hours : 3
Prerequisite: 0334103			
Description: The student will learn the following topics: Importance of farm animals for production of food; breeds of farm animals (dairy cattle, beef cattle, dairy sheep, mutton sheep, wool sheep, dairy goats, chevon goats, chicken broilers, egg-laying chicken); edible (meat, milk and table eggs) and inedible (animal fiber) animal products; physiology of digestive and reproductive systems; increasing animal productivity through proper management of breeding, nutrition, reproduction and health; classification of feedstuffs based on the content of fiber, protein and energy; an overview on livestock sector in Jordan (population of farm animals, breeds, production of meat, milk and table eggs) and challenges facing this sector within the context of climate change.			