Form: Study Plan- Bachelors	Form Number	EXC-01-03-02A
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1.	School	Agriculture
2.	Department	Animal Production
3.	Program title (Arabic)	البكالوريوس في الإنتاج الحيواني
4.	Program title (English)	B.Sc. Degree in Animal Production

5. Components of Curriculum:

The curriculum for the bachelor's degree in Animal Production consists of (138) credit hours as follows

Number	Type of requirement	Type of learning (face-to-face | blended | online)	credit hours
First	University Requirements	face-to-face | blended | online	27
Second	Faculty Requirements	face-to-face | blended	24
Third	Department Requirements	face-to-face | blended | online	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
0	General	5	Animal Physiology and Reproduction
1	Production and Management of Ruminants and Poultry	6	Animal Breeding

2	Production of Camel, Horse, and Fish	7	Management of Natural Rangelands
3	Animal Health and Poultry Diseases	8	Nutrition of Ruminants and Poultry
4	-	9	Project, Research and Field Training

C- Course number consists of 7 digits

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

First: University Requirements:

First: University Requirements (27 Credit Hours):

a- Compulsory Requirements: 18 Credit Hours

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

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	Type of learning
1	Environmental Culture and Development	0310102	3	-	blended
2	Islamic Culture	0400102	3	-	blended
3	Health Culture	0720100	3	-	blended
4	Legal Culture	1000102	3	-	face-to-face
5	Physical Fitness Culture	1100100	3	-	blended
6	Introduction to Philosophy and Critical Thinking	3400103	3	-	online
7	Tourism Culture	3400111	3	-	blended

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

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

Course Number	Course Title	Type of learning	Contact Hours		Credit Hours	Pre-requisite
			Theoretical	Practical		
0301101	Calculus (1)	face-to-face	3	-	3	-
0333106	General Chemistry for Life Sciences	face-to-face	3	-	3	-
0333109	Experimental General Chemistry	face-to-face	-	3	1	0333106 or sim.
0334103	Biology for Life Sciences	face-to-face	3	-	3	-
0304111	Practical General Biology	face-to-face	-	3	1	0334103 or sim.
0342103	General Physics for Life Sciences	face-to-face	3	-	3	-
0332113	Experimental General Physics for Life Sciences	face-to-face	-	3	1	0342103 or sim.
0661101	Principles of Plant Production	face-to-face	3	-	3	0334103
0605151	Biostatistics and Data Analysis	face-to-face	3	-	3	1900103
1900103	Modern Digital Skills	blended	3	-	3	1932099

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

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

A. Obligatory specialty courses: (72) credit hours

Course Number	Course Title	Type of learning	Contact Hours		Credit Hours	Pre-requisite
			Theoretical	Practical		
0602101	Principles of Animal Production	face-to-face	3	-	3	0334103
0602212	Poultry Production	face-to-face	2	2	3	0602101
0602214	Sheep Production	face-to-face	3	-	3	0602101
0602215	Dairy Cattle Production	face-to-face	3	-	3	0602101
0602232	Ruminant Health and Diseases	face-to-face	3	-	3	0602101
0602257	Anatomy and Physiology of Farm Animals	blended	3	-	3	0602101
0602301	General Biochemistry	face-to-face	3	-	3	0334103 0333106
0602318	Poultry Farms Management	face-to-face	3	-	3	0602212
0602319	Dairy Cattle Management	face-to-face	3	-	3	0602215
0602333	Poultry Health and Diseases	face-to-face	2	2	3	0602101
0602361	Genetic Improvement of Farm Animals	face-to-face	2	2	3	0602101
0642383	Fundamentals of Farm Animal Nutrition	face-to-face	3	-	3	0602101
0602455	Reproductive Physiology and Assistive Technologies	face-to-face	2	2	3	0602257
0642483	Feed Resource Analysis	face-to-face	2	2	3	0642383
0602486	Poultry Nutrition	face-to-face	3	-	3	0642383
0602487	Dairy Cattle Nutrition	face-to-face	3	-	3	0642383
0602489	Ruminant Nutrition	face-to-face	3	-	3	0642383
0632459	Environmental Physiology of Farm Animals	blended	2	2	3	0602257
0605101	Principles of Agricultural Economics	face-to-face	3	-	3	0301101
0652492	Graduation Project in Animal Production	face-to-face	-	4	1	(*)
Practical Training and Employability Readiness Program (14) credit hours						
0662490	Fundamentals of Employment Readiness (Interpersonal Skills and Professional Development- General)	face-to-face	3	-	3	(*)
0672491	Employment Readiness- Specialized Skills in Animal Production	face-to-face	3	-	3	(*)
0662493	Field Practices in Dairy Cattle Production	face-to-face	-	8	2	(*)
0662494	Field Practices in Sheep Production	face-to-face	-	8	2	(*)

Course Number	Course Title	Type of learning	Contact Hours		Credit Hours	Pre-requisite
			Theoretical	Practical		
0662495	Field Practices in Poultry Production	face-to-face	-	8	2	(*)
0605497	Field Practices in Agricultural Economics and Agribusiness Management	face-to-face	-	4	1	(*) + 0605101
0633497	Training in Animal Products Manufacturing	face-to-face	-	4	1	(*)

(*) Successfully completing 110 credit hours with the department's approval

B. **Elective specialty courses: (15) credit hours:** The student selects from the two groups mentioned below, with (12 hours from the first group) and (3 hours from the second group), as follows: -

Course Number	Course Title	Type of learning	Contact Hours		Credit Hours	Pre-requisite
			Theoretical	Practical		
Group 1	Animal Production		Student selects 12 credit hours from the following courses			
0602272	Natural Rangelands and Their Management	face-to-face	3	-	3	0602101
0602322	Camel and Horse Production	face-to-face	3	-	3	0602101
0602323	Fish Production	face-to-face	3	-	3	0602101
0632373	Grazing Management	face-to-face	3	-	3	0602101
0602388	Feed Manufacturing and Handling	online	3	-	3	0602101
0602404	Selected Topics in Animal Production	face-to-face	3	-	3	0602101
0632412	Poultry Breeder Production	face-to-face	3	-	3	0602101
0602488	Animal Production in Hot Regions	online	3	-	3	0602101
0602419	Organic Animal Production	face-to-face	3	-	3	0602101
0602417	Meat Animal Production	face-to-face	3	-	3	0602101
0602475	Techniques of Rangeland Development	online	3	-	3	0602101
Group 2	Courses of the School of Agriculture - Other Departments		Student selects 3 credit hours from the following courses			
0603101	Principles of Food and Nutrition	face-to-face	3	-	3	0334103
0601233	Forage Crops Production Systems	blended	3	-	3	0661101
0601250	Principles of Farm Mechanization	online	3	-	3	0342103
0604334	Green Skills and Sustainability	face-to-face	3	-	3	-
0605322	Innovation and Entrepreneurship for Agribusiness	face-to-face	3	-	3	-

Fourth: Courses offered by other faculties and departments

Course Number	Course Title	Type of learning	Contact Hours		Credit Hours	Pre-requisite
			Theoretical	Practical		
0301101	Calculus (1)	face-to-face	3	-	3	-
0333106	General Chemistry for Life Sciences Students	face-to-face	3	-	3	-
0333109	Experimental General Chemistry for Non-Chemistry Students	face-to-face	-	3	1	0333106 or sim.
0334103	General Biological Sciences for Life Sciences Students	face-to-face	3	-	3	-
0304111	Experimental General Biological Sciences 1	face-to-face	-	3	1	0334103 or sim.
0342103	General Physics for Life Sciences Students	face-to-face	3	-	3	-
0332113	Experimental Physics for Life Sciences	face-to-face	-	3	1	0342103 or sim.
0661101	Principles of Plant Production	face-to-face	3	-	3	0334103
0605151	Biostatistics and Data Analysis	face-to-face	3	-	3	1931102
1900103	Modern Digital Skills	blended	3	-	3	1932099
0601250	Principles of Farm Mechanization	online	3	-	3	0342103
0603101	Principles of Food and Nutrition	face-to-face	3	-	3	0334103
0605101	Principles of Agricultural Economics	face-to-face	3	-	3	0301101
0601232	Forage Crop Production Systems	blended	3	-	3	0661101
0604334	Green Skills and Sustainability	face-to-face	3	-	3	-
0605322	Innovation and Entrepreneurship in Agribusiness	face-to-face	3	-	3	-
0605497	Field Practices in Agricultural Economics and Agribusiness Management	face-to-face	-	4	1	(*) + 0605101
0633497	Training in Animal Products Manufacturing	face-to-face	-	4	1	(*)

(*) Successfully completing 110 credit hours with the department's approval

Fifth: Advisory Study Plan

First Year

Fall				Spring			
Course Number	Course Title	Type of learning	Credit Hours	Course Number	Course Title	Type of learning	Credit Hours
0301101	Calculus (1)	face-to-face	3	0661101	Principles of Plant Production	face-to-face	3
0333106	General Chemistry for Life Sciences Students	face-to-face	3	0602101	Principles of Animal Production	face-to-face	3
0333109	Experimental General Chemistry for Non-Chemistry Students	face-to-face	1	0342103	General Physics for Life Sciences Students	face-to-face	3
0334103	Biological Sciences for Life Sciences Students	face-to-face	3	0302113	Experimental General Physics for Life Sciences	face-to-face	1
0304111	Experimental Biological Sciences (1)	face-to-face	1	1900103	Modern Digital Skills	blended	3
	University Requirement	-	3		University Requirement	-	3
Fall Total			14	Spring Total			16
Summer				University requirement		-	3
				University requirement		-	3
Summer Total			6	Academic Year Total			36

Second Year

Fall				Spring			
Course Number	Course Name	Type of learning	Credit Hours	Course Number	Course Name	Type of learning	Credit Hours
0602215	Dairy Cattle Production	face-to-face	3	0602333	Poultry Health and Diseases	face-to-face	3
0602212	Poultry Production	face-to-face	3	0605151	Biostatistics and Data Analysis	face-to-face	3
0602214	Sheep Production	face-to-face	3		Elective Specialty Requirement	-	3
0605101	Principles of Agricultural Economics	face-to-face	3	0642383	Fundamentals of Farm Animal Nutrition	face-to-face	3
0602257	Anatomy and Physiology of Farm Animals	blended	3		University requirement	-	3
Fall Total			15	Spring Total			15
Summer				University requirement		-	3
				Elective Specialty Requirement		-	3
Summer Total			6	Academic Year Total			36

Third Year

Fall				Spring			
Course Number	Course Name	Type of learning	Credit Hours	Course Number	Course Name	Type of learning	Credit Hours
0602301	General Biochemistry	face-to-face	3	0602489	Ruminant Nutrition	face-to-face	3
0602319	Dairy Farm Management	face-to-face	3	0642483	Feed Resource Analysis	face-to-face	3
0602232	Ruminant Health and Diseases	face-to-face	3		Elective Specialty Requirement	-	3
0632459	Environmental Physiology of Farm Animals	blended	3	0602361	Genetic Improvement of Farm Animals	face-to-face	3
	University requirement	-	3	0602318	Poultry Farm Management	face-to-face	3
Fall Total			15	Spring Total			15
Summer				University requirement		-	3
				Elective Specialty Requirement		-	3
Summer Total			6	Academic Year Total			36

Fourth Year

Fall				Spring			
Course Number	Course Name (Practical Training and Employability Readiness Program)	Type of learning	Credit Hours	Course Number	Course Name	Type of learning	Credit Hours
0662490	Fundamentals of Employment Readiness (Interpersonal Skills and Professional Development- General)	face-to-face	3	0602487	Dairy Cattle Nutrition	face-to-face	3
0672491	Employment Readiness: Specialized Skills in Animal Production	face-to-face	3	0602486	Poultry Nutrition	face-to-face	3
0662493	Field Practices in Dairy Cattle Production	face-to-face	2	0602455	Reproductive Physiology and Assistive Technologies	face-to-face	3
0662494	Field Practices in Sheep Production	face-to-face	2	0652492	Graduation Project in Animal Production	face-to-face	1
0662495	Field Practices in Poultry Production	face-to-face	2		Elective Specialty Requirement	-	3
0605497	Field Practices in Agricultural Economics and Agribusiness Management	face-to-face	1		University requirement	-	3
0633497	Training in Animal Products Manufacturing	face-to-face	1				
Fall Total			14	Spring Total			16
Summer				-			-
				-			-
Summer Total			-	Academic Year Total			30

Sixth: Course Description

Speciality courses offered by the department

0602101	Principles of Animal Production	face-to-face	Credit hours: 3
Prerequisite: 0334103			
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.			
0602212	Poultry Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
This course aims to enable students to learn the following topics: the poultry industry in Jordan, breeds and breeding systems, anatomy and physiology of chickens, digestion, absorption and metabolism, hatchery and hatchery management, incubation and care of chicks, management of egg flocks, principles of poultry feeding and product marketing. Practical applications at different stages of production. The practical part includes a visit to a farm producing meat chickens and chicken eggs, and dissection of meat chickens and eggs to know the internal parts and all the different devices that were covered in the theoretical lectures, in addition to determining the quality of eggs by measuring the whites, yolks and thickness of the shell in the laboratory on different egg samples. Provide students with videos about the poultry production process.			
0602214	Sheep Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
This course aims to learn students the information needed to produce and manage sheep farms. The course includes basic information about sheep breeds globally and in the Arab region, genetic principles for breeding, selection and improvement, mating systems in sheep, feeding sheep, fattening lambs, basic management operations, equipment and barns used for sheep, wool and its characteristics, health protection and the most important diseases.			
0602215	Dairy Cattle Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
The registered students of the current course will gain the scientific knowledge related to dairy cattle science. During this course, students will learn many topics regarding dairy cattle production including the basic principles of breeding and systems of genetic improvement, anatomy and physiology of digestive system, the nutrient requirements and feeding practices, anatomy and physiology of reproductive system, and lactation physiology. Furthermore, students will gain the skills of innovative thinking, get the information needed from the right sources, problem solving, assignments, case studies, and group discussions. To achieve the course goals, the evaluation process will be based on a well-designed rubric table.			
0602232	Ruminant Health and Diseases	face-to-face	Credit hours: 3
Prerequisite: 0602101			
This course aims to teach students about environmental factors and their relationship to the health of ruminant animals, the disease clinical signs that appear on the animal. This course also explains the health problems related to water and air in the farm, disinfectants and medications used. This subject also explains common diseases in Jordan and their preventive measures (bacterial, viral and nutritional diseases, External parasites) and methods of their control in ruminant animals. this subject also explains the mode of action of antibiotics and disinfectants. This course includes topics related to biosecurity and its relationship to animal health and zoonotic diseases, ruminant health, antiseptics, medicines, animal			

diseases and their causes (bacterial, viral, internal and external parasites) and methods of controlling and preventing them in ruminants.			
0602257	Anatomy and Physiology of Farm Animals	blended	Credit hours: 3
Prerequisite: 0602101			
By studying this course, students will learn about the various physical components of animals including: cells and tissues, the digestive system, the circulatory system, the urinary system, the nervous system, respiration and reproduction, muscular and skeletal systems, growth and development, species differences. Throughout the course, students will examine the biological mechanisms of farm animals. This is both a valuable stand-alone course and an excellent foundation for further study of animal biology, health and welfare. Interactive videos, assignments, case studies, group discussions are the learning strategies that will be used. In order to achieve the course goals, the evaluation process will be based on a well-designed rubric table. Experts people will be invited to give students lectures or a variety of interactive activities.			
0602301	General Biochemistry	face-to-face	Credit hours: 3
Prerequisite: 0334103 + 0333106			
This course provides an overview of the structural and functional properties of carbohydrates, lipids, amino acids, proteins, nucleic acids, and biological membranes. Emphasis is placed on enzyme kinetics, catalytic mechanisms, and regulatory processes. The course also introduces key concepts in the metabolism of carbohydrates, fats, and proteins, as well as an introduction to signal transduction pathways and their role in cellular communication and regulation.			
0602318	Poultry Farm Management	face-to-face	Credit hours: 3
Prerequisite: 0602212			
This course aims for the student to learn and acquire knowledge in the following topics: the ingredients of the poultry industry in Jordan, the pure and commercial types of chickens, the poultry environment and the design of poultry houses in terms of maintaining heat, humidity and ventilation, the physiology of reproduction and its relationship to lighting, compulsory feather feathering of egg chickens, preventive security in Farms, bird care and welfare, feed materials used in poultry feeding, feed additives in poultry feed, basics of preparing diets. This course is based on active learning, which will be the preparation of different diets, whether for chickens or eggs, by making groups of students, and then discussing each group according to the different diets given. Experienced people will be invited to give students lectures or a variety of interactive activities.			
0602319	Dairy Farm Management	face-to-face	Credit hours: 3
Prerequisite: 0602215			
The registered students of the current course will gain the scientific knowledge related to dairy system management. During this course, students will learn many scientific topics including: the importance of feed storage and feeding methods, use of computer in recording and planning, the use of new techniques in reproduction to improve fertility, the use of new milking machines in controlling diseases, determining bulls' selection criteria for herd improvement and the facilities and equipment needs for housing management, the purpose, methods for, and devices for heat detection apply synchronization to oestrus and to describe hormonal control of oestrus and synchronized ovulation regimen. In addition, students will gain the skills of innovative thinking, get the information needed from the right sources, problem solving assignments, case studies, group discussions. To achieve the course goals, the evaluation process will be based on a well-designed rubric table. Experts people will be invited to give students lectures or a variety of interactive activities.			
0602333	Poultry Health and Diseases	face-to-face	Credit hours: 3
Prerequisite: 0602101			
This course aims to teach students the methods of Poultry autopsy methods and postmortem examination of internal organs and physiology, teaching the students how to recognize and differentiate normal, and abnormal looking internal			

organs. It also includes different bacterial, viral, parasitological and nutritional diseases that affects poultry in Jordan. In the lab students learn poultry autopsy, sample taking, gram stain, media preparation, methods of vaccination and medications administration and serial dilution of bacteria, bacterial counting.			
0602361	**Genetic Improvement of Farm Animals**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0602101			
This course aims at teaching the student the principles of animal breeding and genetics .The students will learn basic information about how animal population improved, Mendelian inheritance, population genetics, comparison between simply inherited and polygenic traits, selection principles for both types of traits, principles of statistical tools applied to animal genetics, mating systems including those that are due to animal performance and relationship: inbreeding and crossbreeding, hybrid vigour and crossbreeding systems.			
0642383	**Fundamentals of Farm Animal Nutrition**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0602101			
The student in this course will learn the basics of farm animal nutrition, its importance, and some related terminology. He will learn about the main nutritional groups in the feed, their digestion in the digestive system (taking care of the variation between the digestive systems of different farm animals), the absorbing methods of digested nutrients, and their metabolism in various farm animals. The student will also learn about the symptoms of nutrients deficiency, in addition to the mechanism of action of enzymes and their role in vital reactions, to know their importance during the nutrients' digestion and metabolism. From all of this, the student will be able to understand the importance of providing the animal with these nutrients in balanced rations and the most important factors that affect nutritional groups' digestion and absorption. The subject is taught to the student through traditional face-to-face learning.			
0602455	**Reproductive Physiology and Assistive Technologies**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0602257			
The registered students of the current course will gain the scientific knowledge related to the Comparative anatomy and physiology of reproduction in domestic animals in both female and male, oestrous cycle, fertilization, gestation and parturition. In addition, students will learn the endocrine regulation of reproductive function, patterns of reproduction, environmental influences on reproductive efficiency, application of selected techniques for controlling reproduction. Laboratory provides application of techniques used in reproductive management such as semen collection, evaluation and preservation, artificial insemination (AI), oestrus and ovulation synchronization programs, multiple ovulation and embryo transfer (MOET) and in vitro fertilization (IVF) and how to evaluate the farm from the reproduction side. Interactive videos, scientific journals, assignments, case studies, and group discussions are the learning strategies that will be used.			
0642483	**Feed Resource Analysis**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0642383			
This course aims to teach the student on the principle and techniques of feed manufacturing technology to provide students with an in-depth understanding of the feed manufacturing process and the knowledge to adequately handle the processing and manufacturing of feed for farm animals in general. Topics include receiving and storing feed materials, milling processes and reducing particle size, patching, processing and mixing feed materials, extruding, drying and cooling, the effect of feed processing on animal nutrition, pelleting, cooling and breakdown, feed processing and ingredients, feed plant design, and systems Steam generation, molds and mycotoxins. Experts people will be invited to give students lectures or a variety of interactive activities.			
0602486	**Poultry Nutrition**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0642383			

The course will provide a basic and thorough understanding of poultry nutrition, review of nutrient constituents of feedstuffs and their role in poultry nutrition, review of feed toxins and contaminants. Students will learn about various components of poultry diets, specifically non-nutritive feed ingredients, and which feedstuffs are used by the poultry industry in Jordan. Moreover, students will learn about different feeding programs used for broiler chicken, egg-type layers and broiler breeders. Some light will be shed on feed processing, manufacturing, and milling technology. The course will encompass a field visit to a feed manufacturing plant and invited guests to cover topics related to poultry nutrition. Experts people will be invited to give students lectures or a variety of interactive activities.			
0602487	**Dairy Cattle Nutrition**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0642383			
The course mainly aims to learn students of the basic and practical principles of feeding milk cows during the various stages of production. The content of the course includes general lines for feeding milk cows, which include feeding suckling calves and rumen development, feeding growing calves, feeding cows before and after childbirth, feeding cows during milking, designing mixtures Fodder, feeding and reproduction relationship, feeding in hot conditions, feed additives, nutritional diseases. Discussion groups will also be used in some parts of the course. Experts people will be invited to give students lectures or a variety of interactive activities..			
0602489	**Ruminant Nutrition**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0642383			
The student in this course will learn more about the specificity of the ruminant digestive system, and he will learn about the microbial environment within the different parts of the digestive system, especially the rumen, and the feed fermentation outputs. He will also learn the classification of feeds used in feeding ruminants, their most important characteristics and nutritional problems, and the difference between concentrates and forage. The student will also learn how to determine the ruminants' voluntary feed intake and nutritional requirements at different life stages and different levels of production. From all of this, he will learn how to build balanced rations.			
0632459	**Environmental Physiology of Farm Animals**	**blended**	**Credit hours: 3**
Prerequisite: 0602257			
The registered students of the current course will gain the scientific knowledge related to the environment of farm animals and the factors affecting their environment such as temperature and humidity in addition to other factors. Skills will be gained by the students by using the most recent published literatures in the field of the environment and its effects on farm animals. The responses of farm animals to heat stress conditions will be intensively studied. The lab course will expose farm animals (mainly poultry) to heat stress to study and scientifically explain the responses. In addition, students will gain practical skills during the lab applications. Interactive videos, scientific journals, assignments, case studies, group discussions, and the final research project which will be presented in front of the student colleagues are the learning strategies that will be used. In order to achieve the course goals, the evaluation process will be based on a well-designed rubric tables.			
0662490	**Fundamentals of Employment Readiness (Interpersonal Skills and Professional Development- General)**	**face-to-face**	**Credit hours: 3**
Prerequisite: Successfully completing 110 credit hours with the department's approval			
This course equips students with fundamentals competencies such as communications, equity and inclusion, leaderships and management, professionalism work ethics and career development. It focuses on enhancing knowledge, workspace skills, attitude and behaviour needed for each competency. The course also provides an introduction to the local and			

regional labour market, job opportunities, and relevant laws and regulations. Additionally, experts from the public and private sectors will share their experiences and provide guidance to students.			
0672491	**Employment Readiness- Specialized Skills in Animal Production**	**face-to-face**	**Credit hours: 3**
Prerequisite: Successfully completing 110 credit hours with the department's approval			
This course equips students with essential competencies for animal production careers. It combines competences such as effective communication, collaboration, adaptation to emerging challenges, technology adoption, and career development in the field of animal production. It focuses on enhancing knowledge, workplace skills, attitudes and behaviour such as problem-solving, decision making, critical thinking, time management, and relevant laws and regulations, and environmental awareness. Additionally, experts from the public and private sectors will share their experiences in the field of animal production and provide guidance to students.			
0652492	**Graduation Project in Animal Production**	**face-to-face**	**Credit hours: 3**
Prerequisite: Successfully completing 110 credit hours with the department's approval			
The student will learn how to prepare a technical report on a topic/issue (nutrition, health, reproduction, marketing, management, environmental…) in animal production and how to prepare and deliver a presentation on the contents of this technical report. The students, in small groups, study an administrative, nutritional or health problem in one of the animal production sectors in terms of its causes and work on finding appropriate solutions and then presenting the outputs in the form of a report and presentation			
0662493	**Field Practices in Dairy Cattle Production**	**face-to-face**	**Credit hours: 2**
Prerequisite: Successfully completing 110 credit hours with the department's approval			
The registered students of the current course will gain the scientific knowledge related to practical training in dairy cows. Skills will be gained by the students by using the most recent published literatures in the field of dairy cows' management, students will have an idea about rearing dairy cow throughout their production cycle. Students will learn how to carry day to day practices. Such practices include calving, feeding suckling animals, feeding the herd at different stages, milking, estrus synchronization, identification, Selection Pathways in Dairy Farms and Selection of Breeding Bull, Bull Nose Ring, Calves Castration, Bloat "Tympany" in Cows, Semen Collection from Bulls and its Evaluation, vaccination, and medication. In addition, students will gain practical skills during the practical training. Interactive videos, assignments, case studies, group discussions are the learning strategies that will be used. In order to achieve the course goals, the evaluation process will be based on a well-designed rubric table.			
0662494	**Field Practices in Sheep Production**	**face-to-face**	**Credit hours: 2**
Prerequisite: Successfully completing 110 credit hours with the department's approval			
The aim of this course is to learn students the basic skills of sheep rearing at the Agricultural Research Station/ Al Ghor. Where they were trained in daily and seasonal routine operations in sheep farms to manage these farms, including methods of catching, determining age, methods of giving medicines, equipment, assistance in childbirth, equipping maternity pens, breast-feeding and weaning new-borns, manual and mechanical milking, weaning and fattening new-borns. It also includes methods for timing oestrus, using sponges, shearing wool, clipping horns and hooves, formal evaluation of the herd, caring for rams and preparing them for mating purposes, and how to select and elect stallions for mating. In addition to the methods of slaughtering and dealing with animals that will be slaughtered.			
0662495	**Field Practices in Poultry Production**	**face-to-face**	**Credit hours: 2**
Prerequisite: Successfully completing 110 credit hours with the department's approval			
This course aims to provide the student with field training on the daily and seasonal routine operations in poultry farms and to acquire the basic applied skills to manage these farms at the Agricultural Research Station in the Ghor and visits to			

poultry farms in Jordan. Where the student receives a group of chicks and takes care of them from the first day until the age of Marketing of heating, food and water, calculating the efficiency of food conversion, then training in the slaughtering process that takes place in slaughterhouses, and calculating the final meat percentage.			
0602272	Natural Rangelands and Their Management	face-to-face	Credit hours: 3
Prerequisite: 0602101			
The student will learn the following topics: kinds and areas of grazing lands at global scale; Importance of rangelands especially for food security; bio-physics of rangelands; components of rangeland ecosystem; succession and retrogression of plants; inventory and monitoring of rangeland resources; preparation of rangeland management plan; indicators for evaluation of rangeland management plan; future of rangelands within the context of climate change; rangeland sector in Jordan.			
0602322	Camel and Horse Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
This course aims to teach students the basics of producing, dealing with and managing camels and horses. In this course, students will learn the necessary information about the importance of camels and horses, the origin and domestication of camel and horse breeds, anatomical characteristics and physiological functions, reproduction, health, productivity, nutrition, uses of different horses, management and dander of camels, and basic routine breeding practices. Experts people will be invited to give students lectures or a variety of interactive activities.			
0602323	Fish Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
This course is concerned with introducing students to the economic and nutritional importance of fish wealth, while giving the student a general overview of the related sciences. The course will provide an overview on fish production includes providing information about fish production in Jordan and the world, types of fish and their characteristics, the foundations and care of fish, the foundations of fish farming from site selection and pond construction, fish productivity from fish farms, fish farming activities and its components, and means of developing fish farms - appropriate nutrition, improvement, operations Hatching, care and fattening, and creating suitable conditions for breeding. The course also contains the most important common diseases, in addition to the problems that educators face and how to overcome them. Experts people will be invited to give students lectures or a variety of interactive activities.			
0632373	Grazing Management	face-to-face	Credit hours: 3
Prerequisite: 0602101			
The student will learn the following topics: objectives of grazing; effect of grazing on the components of rangeland ecosystem (soils, vegetation, hydrology, wildlife; productivity of domestic livestock); needed data/information for preparation of grazing management plans; determination of grazing capacity and selection of suitable grazing plans; basics of grazing management (grazing intensity, grazing season, kind of grazing animal, distribution of grazing animals on rangeland); future of pastoral animal production in Jordan.			
0602388	Feed Manufacturing and Handling	online	Credit hours: 3
Prerequisite: 0602101			
This course aims to teach students the basic methods of forage analysis and determining its nutritional value Where the course includes teaching the students different chemical analysis methods for feed, especially the approximate analysis of feed: which includes moisture, crude protein, crude fat, carbohydrates, crude fiber, ash, in addition to fiber analysis using the “Van Soset” detergent method. Students will also learn the mechanism of using photometric and atomic absorption methods to analyse minor and major minerals. Methods of biological evaluation of feed will be discussed using the digestive tract, digestion coefficient, and estimation of the energy content of the feed.			

0602404	Selected Topics in Animal Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
Develop and expand the student's knowledge and skills in various fields of knowledge, and highlight the latest developments in selected current issues of particular importance in animal production. Experts people will be invited to give students lectures or a variety of interactive activities.			
0632412	Poultry Breeder Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
The purpose of this course is to study the modern systems of poultry breeder production. The students will learn an overview of breeds and breeding programmers used to produce grandparent and parent stocks. All elements of knowledge needed by students for practical management at field level will be covered like physiology of reproduction, factors influencing egg fertility, hatcheries management, health programs, environmental factors, nutrition and feeding programmers. House designs, construction materials, equipment and proposed layouts for future production systems will be covered. A day- to-day management requirements for chicks, growing pullet, rooster and adult breeders will be covered. The course includes field visits to some poultry breeder farms in Jordan			
0602488	Animal Production in Hot Regions	online	Credit hours: 3
Prerequisite: 0602101			
The registered students of the current course will gain the scientific knowledge related to farm animal production in hot regions. Skills will be gained by the students by using the most recent published literatures in the field of farm animal's management in hot regions, including but not limited to housing design, feed additives, reproductive management and the scientific explanation for each management strategy that might help to mitigate the negative consequences caused by hot weather conditions. In addition, students will gain the skills of innovative thinking, get the information needed from the right sources, problem solving by interactive videos, scientific journals, assignments, case studies, group discussions, and the final research project which will be presented in front of the student colleagues. In order to achieve the course goals, the evaluation process will be based on a well-designed rubric table. Experts people will be invited to give students lectures or a variety of interactive activities.			
0602419	Organic Animal Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
The student will learn the following topics: concepts of organic agriculture and organic livestock production; historical development of organic livestock production; the driving forces for organic production; main differences between organic and inorganic livestock production; regulation of organic livestock production; management of organic livestock production (housing, animals, feeds, health, transportation, slaughtering); nutritional value of organic animal products; certification requirements for organic livestock production; challenges facing the industry of organic livestock production globally; organic livestock production in Jordan.			
0602417	Meat Animal Production	face-to-face	Credit hours: 3
Prerequisite: 0602101			
This course aims to provide students with an overview of production animals and their production and management methods. In this course, students will learn about the types of meat-producing animals and their breeds, rearing systems and management practices production and breeding systems, and methods of raising them. Students will also learn the basics of managing the growth of lambs and calves and their growth characteristics, in addition to Nutrition and feeding and caring for new-borns and mothers, food components and diet preparation, fattening, feed additives, growth stimuli and metabolic diseases that can affect them. In addition to Growth of lambs and calves, carcass composition and quality			

the methods of evaluating the carcasses and the resulting meat. Discussion groups will also be used in some parts of the course.			
0602475	Techniques of Rangeland Development	online	Credit hours: 3
Prerequisite: 0602101			
The student will learn the following topics: causes of rangeland degradation (policies and practices); an overview on rangeland improvement techniques (regulation of grazing, water harvesting, plantation of forage species); approaches for collaboration of rural communities; basics for selection of sound improvement techniques (harmony with the current pastoral animal production, requirements for implementation, economics); effect of techniques on rangeland ecosystem components; how to prepare a plan for improving degraded rangelands in arid regions.			

Courses offered by the department to students of other departments/schools/university

0602101	Principles of Animal Production	face-to-face	Credit hours: 3
Prerequisite: 0304101			
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.			
0602301	General Biochemistry	face-to-face	Credit hours: 3
Prerequisite: 0334103 + 0333106			
Students will learn about chemistry of water, amino acids, proteins, carbohydrates, and lipids, vitamins, protein structure and function; enzymology, carbohydrate metabolism, genetic code, regulation of gene expression, selected topics in the molecular physiology of animals. Students evaluation will be based on interactive videos, scientific journals, assignments, case studies, group discussions using a well-structured rubric tables In order to achieve the course goals			
0662490	Fundamentals of Employment Readiness (Interpersonal Skills and Professional Development- General)	face-to-face	Credit hours: 3
Prerequisite: Successfully completing 110 credit hours with the department's approval			
This course equips students with fundamentals competencies such as communications, equity and inclusion, leaderships and management, professionalism work ethics and career development. It focuses on enhancing knowledge, workspace skills, attitude and behaviour needed for each competency. The course also provides an introduction to the local and regional labour market, job opportunities, and relevant laws and regulations. Additionally, experts from the public and private sectors will share their experiences and provide guidance to students.			

Courses offered by other departments for the Bachelor's program

0301101	Calculus (1)	face-to-face	Credit hours: 3
Prerequisite: (None)			
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; L'Hopital's rule; 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.			
0333106	**General Chemistry for Life Sciences Students**	**face-to-face**	**Credit hours: 3**
Prerequisite: (None)			
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.			
0333109	**Experimental General Chemistry for Non-Chemistry Students**	**face-to-face**	**Credit hours: 1**
Prerequisite: 0333106 or sim.			
Selected experiments representing the following subjects in general chemistry: tools and measurements, empirical formula, limiting reagent, acid-base reactions, oxidation reduction reactions, thermodynamics, common ion effect.			
0334103	**General Biological Sciences for Life Sciences Students**	**face-to-face**	**Credit hours: 3**
Prerequisite: (None)			
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.			
0304111	**Experimental General Biological Sciences 1**	**face-to-face**	**Credit hours:**
Prerequisite: 0334103 or sim.			
Laboratory experiments in microscopy and cells, chemical aspects of cells, plant and animal tissues, animal and plant physiology. Mammalian anatomy, and systematic of major living groups.			
0342103	**General Physics for Life Sciences Students**	**face-to-face**	**Credit hours: 3**
Prerequisite: (None)			
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.			
0332113	**Experimental Physics for Life Sciences**	**face-to-face**	**Credit hours: 1**
Prerequisite: 0342103 or sim.			
Laboratory experiments in 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.			
0661101	**Principles of Plant Production**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0334103			
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.			
0605151	**Biostatistics and Data Analysis**	**face-to-face**	**Credit hours: 3**
Prerequisite: 1900103			

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.			
1900103	**Modern Digital Skills**	**blended**	**Credit hours: 3**
Prerequisite: 1932099			
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 instills 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.			
0605497	**Field Practices in Agricultural Economics and Agribusiness**	**face-to-face**	**Credit hours: 1**
Prerequisite: To pass successfully 110 credit hours.			
Practical training in the fields of farm business management, budgeting and financial analysis, agricultural and agro-industries project analysis, and application of statistical, mathematical, economic and management tools for farm data analysis.			
0633497	**Training in Animal Products Manufacturing**	**face-to-face**	**Credit hours: 1**
Prerequisite: To pass successfully 110 credit hours.			
Commodities of Animal origin constitute a major component of the diet of people worldwide, providing essential nutrients, such as proteins and fat, through fresh, minimally processed and fully processed products. The physicochemical properties of milk will be studied, as are the processing methods involved in the conversion of milk to other dairy products such as cheese, yoghurt and butter. The chemistry, structure, composition, properties, uses, and method of processing of animal food such as eggs, fish meat and meat products are also will be studied.			
0603101	**Principles of Food and Nutrition**	**face-to-face**	**Credit hours: 3**
Prerequisite: 0334103			
Introduction to the nutrients with respect to classification, dietary sources, functions and body requirements. Concept of balanced diet and the aetiology and management of malnutrition. Types and causes of food spoilage, food preservation, and food-borne diseases, emphasizing the status of nutrition and food industries in the region.			
0601233	**Forage Crops Production Systems**	**blended**	**Credit hours: 3**
Prerequisite: 0661101			
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.			
0605101	**Principles of Agricultural Economics**	**face-to-face**	**Credit hours: 3**
Prerequisite: 301101			
Analysis of input-output, input-input, economic concepts, resources and systems, 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.			
0601250	**Principles of Farm Mechanization**	**online**	**Credit hours: 3**
Prerequisite : 0661101			
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.			
0604334	**Green Skills and Sustainability**	**face-to-face**	**Credit hours: 3**
Prerequisite: none			
Throughout this course, the student's 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 module combines academic studies with practical learning in various settings, providing learners with real-world experience. The module 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.			
0605322	**Innovation and Entrepreneurship in Agribusiness**	**face-to-face**	**Credit hours: 3**
Prerequisite: none			
This course aims to introduce students to the concepts of innovation and entrepreneurship, providing them with the essential knowledge and skills to develop ideas into viable projects in the agricultural sector. The course employs both theoretical and practical methodologies to train and prepare students to discover opportunities and unleash their potential in this field. Topics covered include: the culture and systems of innovation, creative thinking, entrepreneurship and business modelling, agricultural project management, small businesses, social entrepreneurship, intellectual property, technology marketing, and funding sources. To successfully complete this course, students are required to develop a business plan for a new, feasible project or idea.			

Inclusion rates in the program:

A. Courses that will be taught on the principle of full online:

Total hours that will be taught on the principle of full online in this program: (10.3 hour).

The percentage achieved for the subjects that will be taught on the principle of full online in this program: (7.5 %)

B. Subjects to be taught on the blended learning principle:

The total number of hours that will be taught on the principle of blended learning in this program: (26.7 hour)

Percentage achieved for subjects that will be taught on the principle of blended learning in this program: (19.3 %)

C. Face-to-face learning courses:

Number of hours of face-to-face education: (101 hour).