



1.	School	Agriculture
2.	Department	Animal Production
3.	Program title (Arabic)	دكتوراه في الانتاج الحيواني
4.	Program title (English)	PhD in Animal Production

Plan Number	Specialization #	Degree	Dep #	School #	Year	Track
		9	02	06	2017	Dissertation

**First: General Rules & Conditions:**

1. This plan conforms to valid regulations of the programs of graduate studies.

2. Specialties of Admission:

- The first priority: Master of Animal Production
- The Second priority: Master of Ruminant Animals
- The third priority: Master of Poultry
- The forth priority: Master of Agricultural Science
- The fifth priority: Master of Veterinary Medicine



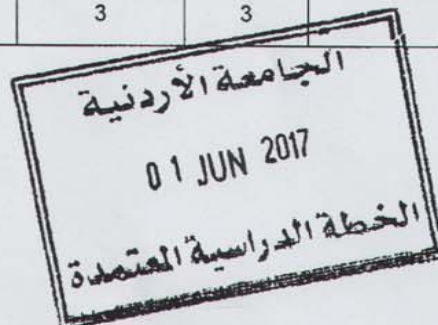
**Second: Special Conditions:**

- None.

**Third: Study Plan: Studying (54) Credit Hours as following:**

1. Obligatory Courses (21) credit hours:

Course No.	Course Title	Credit Hrs	Theory	Practical	Pre/Co-requisite
0631901	Experimental Design and Analysis	3	3	-	-
0602901	Biotechnology in Animal Production	3	3	-	-
0602911	Topics in Farm Animals Environmental Physiology	3	3	-	-
0602931	Biosecurity and Animal Health Management	2	2	-	-
0602951	Endocrinology	3	3	-	-
0602981	Nutritional Biochemistry	3	3	-	-



Handwritten signature and date: 2017/4/1

0602982	Nutrient Metabolism in Farm Animals	3	3	-	-
0602991	Graduate Seminar	1	1	-	-

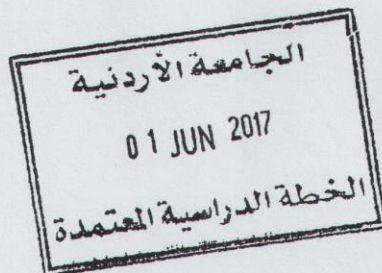
2. Elective Courses (15) Credit Hours: from the following:

Course No.	Course Title	Credit Hrs	Theory	Practical	Pre/Co-requisite
0602912	Heat Stress Management	3	3	-	-
0602913	Organic Meat Production.	3	3	-	-
0602914	Incubation & Hatchery Management	3	3	-	-
0602915	Integrated Management of Poultry Enterprises	3	3	-	-
0602916	Growth & Development of Farm Animals	3	3	-	-
0602932	Zoonotic Disease	3	3	-	-
0602952	Poultry Reproduction	3	3	-	-
0602953	Embryology	3	3	-	-
0602961	Recent advances in Genetic Improvements	3	3	-	-
0602971	Range inventory and monitoring	3	3	-	-
0602983	Recent Topics in Ruminant Nutrition	3	3	-	-
0602984	Feed evaluation systems	3	3	-	-

3. Thesis: (18) Credit hours (0602999).

4. Pass the qualifying exam (0602998).

\*notes



*[Handwritten signature]*  
C.W/2/11

## Course Description

### Faculty of Agriculture Doctoral Program in Animal Production (Dissertation Track)

(0631901) Experimental Design and Analysis (3 Credit Hours)

This course covers advanced statistical methods, design and analysis for agricultural research, such as incomplete block design, Lattice design and Lattice equal confounding and their uses. This course also covers combined analysis of several experiments over space and time.

(0602901) Biotechnology in Animal Production (3 Credit Hours)

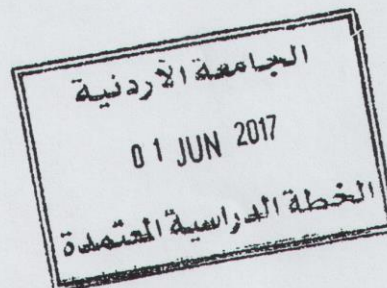
The objective of this course is to provide insight use of animals in areas of biotechnology; this course emphasizes the use of livestock in food production as well as human medicine applications; topics covered include marker-assisted selection of livestock, in vitro fertilization, transgenesis, cloning and stem cell technology. Combines the basic required animal science with a focus on biology and technology. Knowledge of the procedures for marketing authorization of biotechnological products.

(0602911) Topics in Farm Animals Environmental Physiology (3 Credit Hours)

Comprehensive review of the current and classical scientific literature of selected topics related to farm animals environmental physiology, Behavior, Stress and Welfare. Scientific –based practical knowledge of these topics will be emphasized.

(0602912) Heat Stress Management (3 Credit Hours)

Presentations and discussions of the most recent scientific research and literature to establish a fully understanding of heat stress physiology, signs, causes, effects, consequences and assessment. In addition to the advances in management strategies to avoid and alleviate its negative impacts on performance, welfare and health of farm animals. Recent practical heat stress abatement methods will be also emphasized.



(0602913)

**Organic Meat Production.**

**(3 Credit Hours)**

Historical development of organic livestock farming; differences between organic and other forms of animal production; principles and characteristics of organic animal production; management systems: conversion period, breeding, nutrition and feeding, housing, transport and slaughtering; nutritional value of organic meat and potential human health response; and challenges to organic livestock industry.

(0602914)

**Incubation & Hatchery Management**

**(3 Credit Hours)**

This course deals with the embryonic development of bird eggs under commercial and experimental incubation conditions; developmental processes are evaluated relative to various environment and genetic parameters; course will covers factors that affect hatchability of flocks, types of incubation, and hatchery management.

(0602915)

**Integrated Management of Poultry Enterprises**

**(3 Credit Hours)**

The purpose of this course is to study the modern systems of integrated management of poultry enterprises at large scales. There will be a focus on different poultry production systems and their integration into other agricultural operations. House designs, construction materials, and proposed layouts for future systems will be covered. The full integration of different poultry management practices in the whole production cycle with special emphasis on the advanced technology will be covered.

(0602916)

**Growth & Development of Farm Animals**

**(3 Credit Hours)**

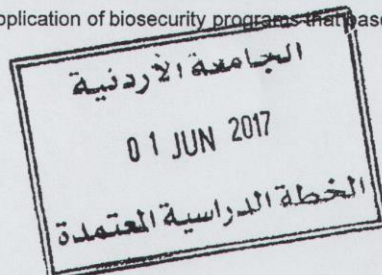
Growth and development of livestock animals with emphasis on the prenatal and postnatal differentiation and development of skeletal muscle, bone, and adipose tissue; organ growth discussed, course covers as well as classical concepts of animal growth along with the genetic, hormonal, and nutritional factors that affect growth.

(0602931)

**Biosecurity and Animal Health Management**

**(2 Credit Hours)**

This course emphasis on study of the effective strategies for health management of livestock animals, disease prevention and control through application of biosecurity programs that based on knowing the nature



س. م. م.  
2017/6/1

of threat (causes of diseases), risk assessment of importing animals from different resources, application of epidemiological principles that support disease monitoring with the using of isolation, quarantine and eradication principles, designing of an effective biosecurity programs for all sectors of animal production, evaluation of the biological, economic and social impact for the success or failure of biosecurity programs, and the using of modern biotechnologies in animal health management.

(0602932)

Zoonotic Disease

(3 Credit Hours)

By the end of this course, the student will acquire the knowledge and skills needed to protect himself as well as maintain human health through prevention and control of zoonotic diseases transmitted from animals or animal products to man.

(0602951)

Endocrinology

(3 Credit Hours)

Course will address the knowledge on hypothalamic-pituitary regulation of physiological systems including reproduction, growth, immune function, digestion, and behavior. Endocrine glands will be studied from the standpoint of their structure, physiological function in relation to the organism, the chemical nature and mechanisms of action of their secretory products, and the nature of anomalies manifested with their dysfunction.

(0602952)

Poultry Reproduction

(3 Credit Hours)

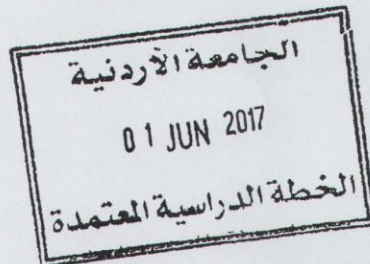
Emphasis is placed on the reproductive physiology of poultry and its relation to nutritional and lighting management programs directed towards maximizing reproductive efficiency; covers topics such as semen collection and evaluation, artificial insemination of poultry, and fertility and hatchability in breeding flocks.

(0602953)

Embryology

(3 Credit Hours)

This course presents basic facts and concepts of embryology, from fertilization to parturition, including early embryonic development, comparative placentation, and major organ development (face, mouth, pharynx, respiratory system, musculoskeletal system, digestive system, vascular system, urogenital system, nervous system, eye and ear) and malformation.



(0602961)

Recent advances in Genetic Improvements

(3 Credit Hours)

This course aims to apply the theories of quantitative and population genetics in genetic improvement, divide the genetic variation, studying the mother influence, studying the overlap between environment and genetic models and the genetic correlating. It is also studies the references of selection, design and analysis of the genetic election experiments and the election using indicators.

(0602971)

Range inventory and monitoring

(3 Credit Hours)

Students will learn the approaches and methodologies for inventory and monitoring of rangeland, sampling techniques for measuring vegetation attributes to assess rangeland health and condition, computing grazing capacity and range condition and forage utilization, analyzing data and interpreting the results, designing and executing and presenting the results of an ecological research project.

(0602981)

Nutritional Biochemistry

(3 Credit Hours)

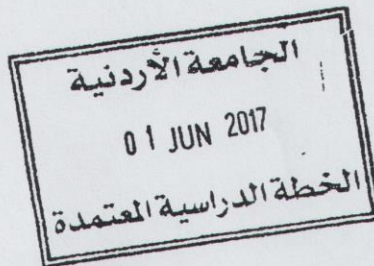
This course emphasis on advanced study of biochemistry related to carbohydrates, fats and farm animals' protein utilization process with focusing on relation between them. Furthermore, studying the metabolic mechanisms in various organs and tissues, with focusing in regulating balance processes in animal body.

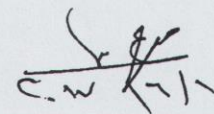
(0602982)

Nutrient Metabolism in Farm Animals

(3 Credit Hours)

This course studies with the basic concepts and recent developments in nutrients metabolism, with a focus on the biochemical, physiological and nutritional implications as well as hormonal regulation. This course also emphasis nutritional aspects comparison between different types of farm animals, determine their feed requirements, discuss the energy and digestible protein and the operations of construction and demolition within the body. Furthermore, advanced understanding the metabolism of proteins and energy and other feed ingredients.





(0602983)

**Recent Topics in Ruminant Nutrition**

**(3 Credit Hours)**

This course will provide students with different new topics related to ruminant nutrition. These topics should cover the new research findings of different subjects. The use of a new feed or develop new mechanisms to address and improve the efficiency of agricultural by-products are considered as an important topic that could be covered. Development of new mechanisms to estimate protein digestibility or the use of new protein resources and any other new topics related to ruminant nutrition could also be covered by this course.

(0602984)

**Feed evaluation systems**

**(3 Credit Hours)**

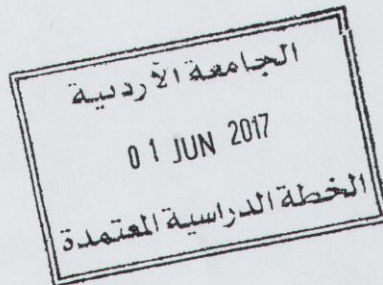
Studying an integrated method for evaluating feed rations used in animal nutrition, which include different aspects. Collection the information of chemical composition and physical properties of feed ration, feed intake and times number of feeding, protein and energy value of feed ration, digestion and metabolism of available nutrients in feed ration, detailed information about target animal, and estimated values of predicted production of animal products (meat, eggs, milk). By using this information, the appropriateness of feed ration or feed materials suggested for feeding animals is evaluated.

(0602991)

**Graduate Seminar**

**(1 Credit Hours)**

This course is designed to give the graduate students an opportunity to explore topics of current interest in animal production. Students may select topics in line with their intended research and prepare presentations for faculty. Students will receive feedback from the faculty members attending the seminar.



0602982	Nutrient Metabolism in Farm Animals	3	3	-	-
0602991	Graduate Seminar	1	1	-	-

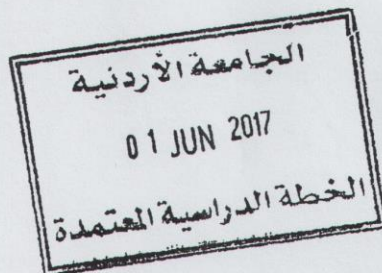
2. Elective Courses (15) Credit Hours: from the following:

Course No.	Course Title	Credit Hrs	Theory	Practical	Pre/Co-requisite
0602912	Heat Stress Management	3	3	-	-
0602913	Organic Meat Production.	3	3	-	-
0602914	Incubation & Hatchery Management	3	3	-	-
0602915	Integrated Management of Poultry Enterprises	3	3	-	-
0602916	Growth & Development of Farm Animals	3	3	-	-
0602932	Zoonotic Disease	3	3	-	-
0602952	Poultry Reproduction	3	3	-	-
0602953	Embryology	3	3	-	-
0602961	Recent advances in Genetic Improvements	3	3	-	-
0602971	Range inventory and monitoring	3	3	-	-
0602983	Recent Topics in Ruminant Nutrition	3	3	-	-
0602984	Feed evaluation systems	3	3	-	-

3. Thesis: (18) Credit hours (0602999).

4. Pass the qualifying exam (0602998).

\*notes



*[Handwritten Signature]*  
C.W/2/11



## Course Description

### Faculty of Agriculture Doctoral Program in Animal Production (Dissertation Track)

(0631901) Experimental Design and Analysis (3 Credit Hours)

This course covers advanced statistical methods, design and analysis for agricultural research, such as incomplete block design, Lattice design and Lattice equal confounding and their uses. This course also covers combined analysis of several experiments over space and time.

(0602901) Biotechnology in Animal Production (3 Credit Hours)

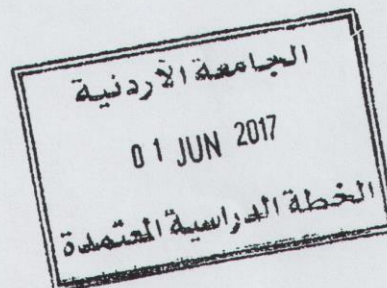
The objective of this course is to provide insight use of animals in areas of biotechnology; this course emphasizes the use of livestock in food production as well as human medicine applications; topics covered include marker-assisted selection of livestock, in vitro fertilization, transgenesis, cloning and stem cell technology. Combines the basic required animal science with a focus on biology and technology. Knowledge of the procedures for marketing authorization of biotechnological products.

(0602911) Topics in Farm Animals Environmental Physiology (3 Credit Hours)

Comprehensive review of the current and classical scientific literature of selected topics related to farm animals environmental physiology, Behavior, Stress and Welfare. Scientific –based practical knowledge of these topics will be emphasized.

(0602912) Heat Stress Management (3 Credit Hours)

Presentations and discussions of the most recent scientific research and literature to establish a fully understanding of heat stress physiology, signs, causes, effects, consequences and assessment. In addition to the advances in management strategies to avoid and alleviate its negative impacts on performance, welfare and health of farm animals. Recent practical heat stress abatement methods will be also emphasized.



(0602913)

**Organic Meat Production.**

**(3 Credit Hours)**

Historical development of organic livestock farming; differences between organic and other forms of animal production; principles and characteristics of organic animal production; management systems: conversion period, breeding, nutrition and feeding, housing, transport and slaughtering; nutritional value of organic meat and potential human health response; and challenges to organic livestock industry.

(0602914)

**Incubation & Hatchery Management**

**(3 Credit Hours)**

This course deals with the embryonic development of bird eggs under commercial and experimental incubation conditions; developmental processes are evaluated relative to various environment and genetic parameters; course will covers factors that affect hatchability of flocks, types of incubation, and hatchery management.

(0602915)

**Integrated Management of Poultry Enterprises**

**(3 Credit Hours)**

The purpose of this course is to study the modern systems of integrated management of poultry enterprises at large scales. There will be a focus on different poultry production systems and their integration into other agricultural operations. House designs, construction materials, and proposed layouts for future systems will be covered. The full integration of different poultry management practices in the whole production cycle with special emphasis on the advanced technology will be covered.

(0602916)

**Growth & Development of Farm Animals**

**(3 Credit Hours)**

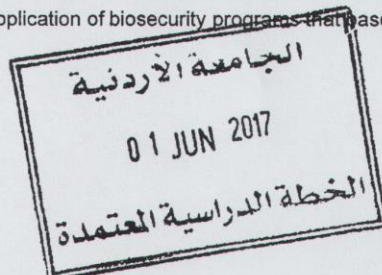
Growth and development of livestock animals with emphasis on the prenatal and postnatal differentiation and development of skeletal muscle, bone, and adipose tissue; organ growth discussed, course covers as well as classical concepts of animal growth along with the genetic, hormonal, and nutritional factors that affect growth.

(0602931)

**Biosecurity and Animal Health Management**

**(2 Credit Hours)**

This course emphasis on study of the effective strategies for health management of livestock animals, disease prevention and control through application of biosecurity programs that based on knowing the nature



س. م. م. م.  
2017/6/1

of threat (causes of diseases), risk assessment of importing animals from different resources, application of epidemiological principles that support disease monitoring with the using of isolation, quarantine and eradication principles, designing of an effective biosecurity programs for all sectors of animal production, evaluation of the biological, economic and social impact for the success or failure of biosecurity programs, and the using of modern biotechnologies in animal health management.

(0602932)

Zoonotic Disease

(3 Credit Hours)

By the end of this course, the student will acquire the knowledge and skills needed to protect himself as well as maintain human health through prevention and control of zoonotic diseases transmitted from animals or animal products to man.

(0602951)

Endocrinology

(3 Credit Hours)

Course will address the knowledge on hypothalamic-pituitary regulation of physiological systems including reproduction, growth, immune function, digestion, and behavior. Endocrine glands will be studied from the standpoint of their structure, physiological function in relation to the organism, the chemical nature and mechanisms of action of their secretory products, and the nature of anomalies manifested with their dysfunction.

(0602952)

Poultry Reproduction

(3 Credit Hours)

Emphasis is placed on the reproductive physiology of poultry and its relation to nutritional and lighting management programs directed towards maximizing reproductive efficiency; covers topics such as semen collection and evaluation, artificial insemination of poultry, and fertility and hatchability in breeding flocks.

(0602953)

Embryology

(3 Credit Hours)

This course presents basic facts and concepts of embryology, from fertilization to parturition, including early embryonic development, comparative placentation, and major organ development (face, mouth, pharynx, respiratory system, musculoskeletal system, digestive system, vascular system, urogenital system, nervous system, eye and ear) and malformation.

الجامعة الأردنية  
01 JUN 2017  
الخطة الدراسية المعتمدة

م.ن  
١٦/١

(0602961)

Recent advances in Genetic Improvements

(3 Credit Hours)

This course aims to apply the theories of quantitative and population genetics in genetic improvement, divide the genetic variation, studying the mother influence, studying the overlap between environment and genetic models and the genetic correlating. It is also studies the references of selection, design and analysis of the genetic election experiments and the election using indicators.

(0602971)

Range inventory and monitoring

(3 Credit Hours)

Students will learn the approaches and methodologies for inventory and monitoring of rangeland, sampling techniques for measuring vegetation attributes to assess rangeland health and condition, computing grazing capacity and range condition and forage utilization, analyzing data and interpreting the results, designing and executing and presenting the results of an ecological research project.

(0602981)

Nutritional Biochemistry

(3 Credit Hours)

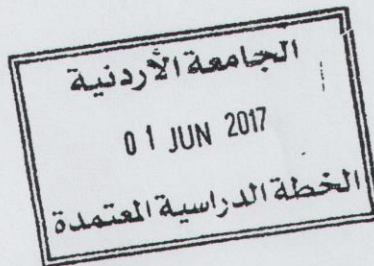
This course emphasis on advanced study of biochemistry related to carbohydrates, fats and farm animals' protein utilization process with focusing on relation between them. Furthermore, studying the metabolic mechanisms in various organs and tissues, with focusing in regulating balance processes in animal body.

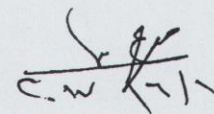
(0602982)

Nutrient Metabolism in Farm Animals

(3 Credit Hours)

This course studies with the basic concepts and recent developments in nutrients metabolism, with a focus on the biochemical, physiological and nutritional implications as well as hormonal regulation. This course also emphasis nutritional aspects comparison between different types of farm animals, determine their feed requirements, discuss the energy and digestible protein and the operations of construction and demolition within the body. Furthermore, advanced understanding the metabolism of proteins and energy and other feed ingredients.





(0602983)

**Recent Topics in Ruminant Nutrition**

**(3 Credit Hours)**

This course will provide students with different new topics related to ruminant nutrition. These topics should cover the new research findings of different subjects. The use of a new feed or develop new mechanisms to address and improve the efficiency of agricultural by-products are considered as an important topic that could be covered. Development of new mechanisms to estimate protein digestibility or the use of new protein resources and any other new topics related to ruminant nutrition could also be covered by this course.

(0602984)

**Feed evaluation systems**

**(3 Credit Hours)**

Studying an integrated method for evaluating feed rations used in animal nutrition, which include different aspects. Collection the information of chemical composition and physical properties of feed ration, feed intake and times number of feeding, protein and energy value of feed ration, digestion and metabolism of available nutrients in feed ration, detailed information about target animal, and estimated values of predicted production of animal products (meat, eggs, milk). By using this information, the appropriateness of feed ration or feed materials suggested for feeding animals is evaluated.

(0602991)

**Graduate Seminar**

**(1 Credit Hours)**

This course is designed to give the graduate students an opportunity to explore topics of current interest in animal production. Students may select topics in line with their intended research and prepare presentations for faculty. Students will receive feedback from the faculty members attending the seminar.

