האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

VETERINARY EMBRYOLOGY - 65716

Last update 04-08-2016

HU Credits: 2

Degree/Cycle: 2nd degree (Master)

Responsible Department: veterinary medicine

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Rehovot

Course/Module Coordinator: Dr. Dalit Sela-Ddonenfeld

Coordinator Email: dalit.seladon@mail.huji.ac.il

Coordinator Office Hours: By appointment

Teaching Staff:

Dr. Dalit Sela-Donenfeld

Course/Module description:

Anatomical and cellular processes that occur during embryonic development of multiple animals in order to understand the similarities and differences of avian and mammalian embryogenesis. The course teaches fundamental stages of embryonic development such as the characteristics of the fertilized egg of multiple animals, cleavages of the embryo, implantation, gastrulation, neurulation, and formation of placenta in different animals. Lectures are also given on different aspects of organogenesis such as the development of the central and peripheral nervous systems, sensory organs, heart and circulation, skeleton-muscle system, urogenital and digestive systems, limbs, skin and glands A special emphasis will be given on birth defects that are induced by genetic or environmental causes that are relevant to veterinary medicine.

Course/Module aims:

1. Studying the different stages of embryos and their organs
2. Studying the development of the placenta and other extra-embryonic tissues
3. Recognizing the main birth defects that occur at distinct developmental stages and organs
4. Understanding the similarities and differences of embryogenesis in different animals

Learning outcomes - On successful completion of this module, students should be able to:

A. Knowing in depth and being able to compare between the stages of embryonic/fetal development in different animals
B. Recognize and distinguish between normal and malformed embryogeneis
C. Recognize the key factors which induce birth defects of various kinds

Attendance requirements(%):

100

Teaching arrangement and method of instruction: lectures

Course/Module Content:

Lesson 1: Introduction to Veterinary Embryology: importance, uses and examples.
Lesson 2: The process of fertilization:

a. Formation of zygote, fusion of the genetic material, Fertilization rates in different mammals, In vitro fertilization, breeding, embryo transfer, cloning
b. Abnormalities during fertilization of different animals.
Lessons 3-4: Cleavages and gastrulation:
a. Cleavage in different animal, blastocyst formation, impairments in the cleavages, twins.
b. Gastrulation, determination of the initial body structures (notochord, endoderm, mesoderm, ectoderm), formation of body axes, defects
Lesson 5-6: Ectoderm- Nervous system development, eye development as a sensory organ:
a. Neural tube formation, differentiation onto the brain and spinal cord, formation of different neural cell types, the development of the neural crest, main congenital defects
b. Development of the eye and abnormalities
Lesson 7: Mesoderm- Somite development:
a. Somites, sclerotome, myotome and different muscles, congenital defects
b. Skin development, dermis and epidermis, development of feathers/fur, development of milk glands, malformations
Lesson 8: Mesoderm - Skeleton development:
Formation of long or flat bone, cartilage, limbs, malformation
Lesson 9-10: Extra-embryonic tissues:
a. The 4 types of extra-embryonic tissues,
b. Placenta in different animals, pathologies
c. Umbilical cord in different animals
Lesson 11: Mesoderm - The cardiovascular system:
Heart development, blood vessel development, congenital heart defects
Lesson 12: Mesoderm – The urogenital system
a. Development of the fetal kidneys, ureter, bladder, malformations
b. Development of the genital system, ducts, malformations
Lesson 13: Meeting with a veterinarian:
Discussion of the main congenital defects of large animals and their etiology
Lesson 14: Endoderm- The development of the gut and lung:
a. The development of the entire gut tube, liver and pancreas, malformations
b. trachea and lung development, birth defects.

Required Reading:
none

Additional Reading Material:
1. Developmental Biology,8th edition, Gilbert. 2007.
2.Veterinary Embryology. McGeady et al.2008
3.The embryology of domestic animals. Noden and Lahunta. 1985

4. Before we are born, Essentials of embryology and birth defects. Moore and Persaud. 2008
5.Langman's medical embryology. Sadler. 2006
6.Veterinary developmental Anatomy. Fletche et al. 2008- web -address: http://vanat.cvm.umn.edu/vanat.pdf/EmbryoLectNotes.pdf

Course/Module evaluation:
End of year written/oral examination 100 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:
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