زانکۆی پۆلیتەکنیکی هەولێر
ERBIL POLYTECHNIC UNIVERSITY

(Histopathological technique) Course Catalogue

2020-2021

College/ Institute	**Shaqlawa technical Institute**	
Department	**Veterinary**	
Module Name	**Histology and Embryology**	
Module Code		
Semester	**6**	
Credit	**6**	
Module type	**Core**	
Weekly hours	**4**	
Weekly hours (Theory)	**(2)hr Class**	**( )hr Workload**
Weekly hours (Practical)	**(2)hr Class**	**( )hr Workload**
Lecturer (Theory)	**Azhin S. Ali**	
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Lecturer (Practical)	**Azhin S. Ali, Mr. Ramazan**	
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Course Book

Course overview:

This course which consists of (2) hours lecture & (2) hrs lab. per week for (12) weeks, is an introduction to Veterinary Histology and Embryology theoretically and observing slides of all types tissues with some examples of formation, growth and development of embryos during practical parts.

Course objective:

The purpose of this course is to introduce the students to veterinary histology which include all types of tissues in detailed morphology, characterizations, classifications, functions and positions. Besides, introduction of how embryo form, grow and develop.

At the conclusion of this course the student should be able to demonstrate through written examinations, quizzes, and oral discussion the following achievements:

1. Demonstrate and understanding of basic histology and general anatomy.
2. Explaining of different types of tissues in details.
3. Formation, growth and development of embryo.

Student's obligation

The students should be attendance and complete of all tests, exams and assignments. They also do reports and seminars.

Forms of teaching

lecture halls with data show equipment for lecture presentations and white board during theoretical part, and showing slides of histology and embryology with gross examination of some embryo during practical part.

Assessment scheme

10% Mid. Theory exam
15% Mid. practical exam
8% Quiz
2% Activity
2% homework
8% Seminar
8% Report
7% Lab report
20% final practical
20% final theory

Specific learning outcome:

On successful completion of this program, graduates will be able to

1- Identify evaluate and apply major theoretical traditions in veterinary histology
2- Understand how the using light microscope.
3- Could be able to see all types of tissues under light microscope.

4- Could be able to identify all types of tissues under light microscope.
5- Could be able to see stage of embryo develop through gross examinations.
6- Personal safety.

Course Reading List and References:

1. Essentials of veterinary histology and embryology by Dr. Ranajit Kumar Ghosh, second edition.
2. Veterinary histology of domestic mammals and birds (text and colour atlas), by Hans-Georg Liebich, fifth edition.
3. Veterinary histology by Ryan Jennings and Christopher Premanandan,

- **Course topics (Theory)**	**Week**	**Learning Outcome**
Definitions of histology, anatomy and embryology Explanation about body organizations Explanation of the general structure of the cells, tissue, organ, organ system. Explanation of importance of Histology and embryology in veterinary line.	First week	Able to knowing the general information about this module and definition of some related concepts And How to be prepared for this course requirements
Epithelial tissues,	Second week	Able to know how biopsy will obtain from patients
Connective tissue	Third week	Must be able to knowing all the steps of Histological technique in general and detailed information about fixation process
Connective tissues	Forth week	Must be able to knowing detailed information about declassifications process
Muscular tissue	Fifth week	Must be able to knowing detailed information about Dehydration and Clearing process

Nervous tissue	Sixth week	Be able to knowing detailed information about Infiltration (impregnation) and embedding
Embryology 1 General Introduction to Embryology Female Reproductive system	Seventh week	The aim of the course and the introduction of reference books, the place of embryology in the veterinary curriculum and its relationship with other disciplines, the definition and history of embryology, the female genital system, gametogenesis, ovulation, genital cycle (ovary and uterus cycle), estrus cycle
Embryology 2 Male Reproductive system	Eighth week	Male genital system, gametogenesis, appendage glands and structure of spermatozoa.
Embryology 3 Fertilization	Ninth week	Transport of spermatozoon and oocyte in female genital tract in mammals, fertilization process, acrosome, reaction, zona reaction, sex discrimination. Types of oocytes, post-zygote divisions according to species, division types (amphioxus, frog, mammal and poultry)
Embryology 4 Formation of morula, blastula and gastrulation by species (Amphioxus and amphibian, winged and mammalian).	Tenth week	Formation of morula, blastula and gastrulation by species (Amphioxus and amphibian, winged and mammalian).
Embryology 5 Neurolation and formation of somites, formation of chorda dorsalis and neural plate, notochord and neural induction, sclerotome, myotome.	Eleventh week	Neurolation and formation of somites, formation of chorda dorsalis and neural plate, notochord and neural induction, sclerotome, myotome.

Embryology 6	Twelfth week	Extraembryonic sacs (amnion, chorion, allantois and vitellus sacs) and umbilical cord, implantation, placentation, and placental types, congenital anomalies.
- **Practical Topics (If there is any)**	**Week**	**Learning Outcome**
Introduction to microscope	First week	Be able to how use microscope.
Epithelial tissues	Second week	Be able to recognize all types of epithelial tissues under microscope.
Connective tissues	Third week	Be able to recognize some types of connective tissues under microscope.
Connective tissues	Forth week	Be able to recognize some types of connective tissues under microscope.
Muscular tissues	Fifth week	Be able to recognize all types of muscular tissues under microscope.
Nervous tissues	Sixth week	Be able to recognize all types of nervous tissues under microscope.
Embryology 1 Female Reproductive system	Seventh week	Being able to recognizing all parts of female reproductive system after dissection of birds and one of mammals
Embryology 2 Male Reproductive system	Eighth week	Being able to recognizing all parts of female reproductive system after dissection of birds and one of mammals

Embryology 3 Fertilization	Ninth week	Be able to seeing some types of sperms and egg for both birds, mammals and poultry
Embryology 4 Formation of morula, blastula and gastrulation by species (Amphioxus and amphibian, winged and mammalian).	Tenth week	Be able to recognizing morula, blastula and gastrulation by species (Amphioxus and amphibian, winged and mammalian).
Embryology 5 Neurolation and formation of somites, formation of chorda dorsalis and neural plate, notochord and neural induction, sclerotome, myotome.	Eleventh week	Be able to recognizing Neurolation and formation of somites, formation of chorda dorsalis and neural plate, notochord and neural induction, sclerotome, myotome.
Embryology 6 Extraembryonic sacs (amnion, chorion, allantois and vitellus sacs) and umbilical cord, implantation, placentation, and placental types, congenital anomalies.	Twelfth week	Be able to recognizing Extraembryonic sacs (amnion, chorion, allantois and vitellus sacs) and umbilical cord, implantation, placentation, and placental types, congenital anomalies.

Examinations (question design):

Q/ Enumerate followings;

1. Types of epithelial tissue depending on number of layers
2. Types of fibers of connective tissues
3. Stains use in preparing histological slides
4. cytological fixative

Q/ Answer the followings:

1. describe endothelium histologically
2. define histology and embryology
3. What is morula?

External Evaluator