



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Biotechnological Applications							
Course Code		VDJ544		Course Level		Second Cycle (Master's Degree)			
ECTS Credit	3	Workload	75 (Hours)	Theory	1	Practice	2	Laboratory	0
Objectives of the Course		To gain basic knowledge about reproductive biotechnology and demonstrate the applicability of these in the field of veterinary medicine. Determining in which application areas will some biotechnological methods for the development of country's farming take place							
Course Content		To explain the Usage and development of some actual biotechnological applications in veterinary gynecology							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Discussion, Project Based Study, Individual Study, Problem Solving					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	60
Assignment	4	20

Recommended or Required Reading

1	Alaçam, E. (2002) Doğum ve İnfertilite, Medisan Yayınları, Ankara.
2	Johnston, S.D., Kustritz, M.V.R., Olson, P.N.S. (2001) Canine and Feline Theriogenoiogy, W.B. Saunders Comp., Philadelphia.
3	Noakes, D.E., Parkinson, T.J., England, G.C.W. (2001) Artur's Veterinary Reproduction and Obstetrics, W.B. Saunders Comp., Philadelphia.
4	Hafez, E.S.E. (1993) Reproduction in Farm Animals, Lea & Febiger, Philadelphia.
5	Dinç, D.A. (2008) Ultrason fiziği ve ineklerde reproduktif ultrasonografi, Pozitif Matbaacılık Ltd. Şti, Ankara.
6	J. Kevin KEALY, H. Mc ALLISTER (2005) Diagnostic Radiology and Ultrasonography of the Dog and Cat

Week	Weekly Detailed Course Contents	
1	Theoretical	Definition of in vitro embryo production, advantages of in vitro embryo production, factors affecting the success in vitro embryo production
	Practice	Method used to obtain oocytes from slaughterhouse material
2	Theoretical	Methods used for obtaining oocytes from slaughterhouse material, aspiration, slicing and dissection methods, mediums used in washing os oocytes
	Practice	Method used to obtain oocytes from slaughterhouse material
3	Theoretical	Methods used for obtaining oocytes and embryo from live animals; obtaining oocytes and embryo with surgical method, transvaginally collection of oocytes and embryos with ultrason-guided (Ovum pick up; OPU)
	Practice	Methods for obtaining oocytes and embryo from live animals
4	Theoretical	Maturation of immature oocytes under laboratory conditions (in vitro maturation; IVM)
	Practice	Methods for obtaining oocytes and embryo from live animals
5	Theoretical	Fertilization of in vitro matured oocytes in laboratory (in vitro fertilization; IVF) methods that are the most commonly used for preparation of sperm: swim-up and perkol separation methods
	Practice	Methods for obtaining oocytes and embryo from live animals
6	Theoretical	Sperm injection
	Practice	Maturation of immature oocytes under laboratory conditions
7	Theoretical	Classification of embryos according to development stage: oosperm, two cells, four cells, eight cells, sixteen cells, morula, blastocyst; morphologic evaluation in embryos; very good, good, medium and weak
	Practice	Fertilisation of in vitro matured oocytes in laboratory
8	Theoretical	Culture medias used for development of embryos after IVF; in vivo and in vitro culture media; medias used for in vitro culture; co-culture, definition contents, simple and nondefinition contents complex culture medias
	Practice	Fertilisation of in vitro matured oocytes in laboratory



9	Practice	Sperm injection
	Intermediate Exam	Intermediate exam
10	Theoretical	Definition of cryopreservation, advantages and methods used for cryopreservation: slow freezing, fast freezing and vitrification
	Practice	Sperm injection
11	Theoretical	Cryopreservation of oocytes and embryos, cryopreservation of oocyte tissue
	Practice	Classification of embryos according to development stage
12	Theoretical	Determination of embryos sex before transfer, advantages, methods used for determination of sex
	Practice	Classification of embryos according to development stage
13	Theoretical	what is transgenic, advantages of transgenic animals production, methods used for production of transgenic animals
	Practice	Preparation of culture medias in which embryos continuing development after IVF
14	Theoretical	Definition of embryonic stem cells, possibilities of usage in veterinary medicine and human medicine
	Practice	Preparation of culture medias in which embryos continuing development after IVF
15	Theoretical	What is cloning, main possibilities of usage, therapeutic cloning, methods used for cloning
	Practice	Preparation of culture medias in which embryos continuing development after IVF
16	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	1	14
Lecture - Practice	14	0	2	28
Assignment	4	0	1	4
Reading	14	0	1	14
Midterm Examination	1	5	2	7
Final Examination	1	6	2	8
Total Workload (Hours)				75
[Total Workload (Hours) / 25*] = ECTS				3

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	To be able to comprehend reproductive biotechnology
2	To be able to comprehend in vitro production of embryo, cryopreservation of oocytes and embryos, determination of sex
3	To be able to comprehend intracytoplasmic sperm injection and production of chimeric animals
4	To be able to comprehend production of transgenic farm animals and cloning subjects
5	To be able to comprehend applicability of these methods in the field of veterinary medicine
6	To be able to comprehend some biotechnological methods which include application areas for the development of country's farming

Programme Outcomes (Obstetrics and Gynecology (Veterinary Medicine) Master)

1	Acquiring basic principles and establishing crucial links in the theory and practical aspects in the field of Obstetrics and Gynecology. Getting grip on the animal's reproductive systems, organs, structures and their functional features.
2	Reproductive anatomy of the female animals, embryonic development of the gonads, maturation, cellular and hormonal mechanisms of oogenesis and mechanisms of ovulation and transport of ovum. Sexual cycles of the female animals and their species related differences.
3	Being informed about the fertilisation, early embryonic development, implantation and pregnancy. Fetal development, intrauterine life and detection of risked pregnancies. Learning to deal with the the issues of abortion. Knowing the hormonal and obstetrical aspects of normal parturition. Recognizing dystocia cases and being aware of predisposing and effective etiology of dystocia. Learning the initial approach to dystocia cases and learning to choose the appropriate intervention. Learning to apply the obstetrical methods.
4	Being informed about the puerperium and postpartum periods, learning the physiology and diagnosis and treatment of pathological conditions (metabolic, infectious and traumatic) during the transition period. Learn the ability to perform intrauterine applications. Acquiring right approaches on handling mother and the offspring in the puerperal period. Learning about the care and diseases of the newborn.
5	Gaining experience about the fertility parameters in the farm animals. Being informed about the diagnosis and therapy of infertility cases and management of them in the herd scale. Learning necessary precautions and management practices for establishing the reproductivity as a branch of herd health. Being informed about the effects of nutrition and management on reproduction.



6	Acquiring the knowledge of the hormones and their clinical applications, affecting reproduction directly or indirectly. Learning methods of sexual synchronisation and appropriate timing of insemination or mating. Being able to administer medical and operative contraceptive methods to female animals. Being informed about assisted reproductive techniques.
7	Administering specialized systematic examination of female animals, performing morphologic and functional examination of the female genitalia and mammary glands thus learning the diagnosis of hormonal, infectious, traumatic and tumoral diseases. Gaining skills in surgical therapy or/and elective gynaecological-oncological, udder and teat operations of the related diseases.
8	Having knowledge of the etiology, diagnosis and therapy of mastitis. Learning necessary precautions and management practices to control mastitis incidence in farm animals particularly in dairy enterprises. Having knowledge of etiology, diagnosis and therapy of circulatory disorders and infectious and non-infectious skin diseases.
9	Being informed about frequently used anesthetic methods and anesthetic agents, analgesics, antibiotics, liquid therapy and other medical agents. Gaining skills in solving problems due to reproductive emergency cases, being able to make definitive diagnosis by clinical symptomatic data and administer appropriate therapy in various animal species.
10	Learning methods and principles of scientific research, learn and acquire scientific ethics concept. Being aware of current developments by surveying and analyzing scientific literature. Gaining skills in interpreting classical knowledge of the scientific area to the students and the community.
11	Being able to plan, conduct and accomplish an original scientific study that can deliver novelty, develop a new scientific method or adopt a known method to a new area and present the results as a scientific article, in the area of obstetrics and gynaecology.

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5	L6
P1	4	4	4	4	4	4

