Jordan University of Science and Technology

Faculty of Science & Arts

Biotechnology & Genetic Engineering Department

BT411 Animal Biotechnology
Summer Semester 2019-2020

Course Catalog
2 Credit Hours. Course Description: The course Animal Biotechnology is devoted to the study of transgenic animals, cloning, stem cells and their applications. In addition the course covers assisted reproductive technology (ART) and their applications.

Text Book	
Title	. Biotechnology, an Introduction
Author(s)	Susan R. Barnum
Edition	2nd Edition
Short Name	Ref#1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#2	Transgenic Mammals	John Bishop	1st Edition	

Instructor	
Name	**Prof. Ahmad Bateiha**
Office Location	PH1L0
Office Hours	Sun : 09:00 - 10:00 Sun : 13:00 - 14:00 Mon : 09:00 - 10:00 Tue : 09:00 - 10:00 Wed : 09:00 - 10:00 Thu : 09:00 - 10:00
Email	betieha@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Mon, Tue, Wed : 10:00 - 11:00 Room: منصة الكترونية

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
962300	BT230 Basic Biotechnology	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Animal Biotechnology & Transgenic Animals: ? DNA microinjection method ? Retrovirus vector (RNA virus) method ? Engineered embryonic stem cell method ? Transfer of diploid somatic nuclei ? Mitochondrial transgenesis	**Chapter 1** From **Ref#1**
Weeks 3, 4	Development and use of transgenic animals (Applications) ? Transgenic mice ? Transgenic sheep, goats and pigs ? Transgenic cattle ? Transgenic birds and fish	From **Ref#2**
Week 5	Transgenic animals as bioreactors (recombinant proteins) ? Production of human proteins ? Xenotransplantation, animal organs for human patients ? Altering components of milk such as removing lactose ? Genetically Engineered hormones and vaccines	From **Ref#2**
Week 6	Cloning: - Embryonic cloning - Therapeutic cloning - Nuclear transfer cloning (Adult cloning) - Applications - Ethics of cloning	From **Ref#1**
Week 7	Embryo Fusion and chimera production	From **Ref#1**, From **Ref#2**
Week 8	Stem Cells: - Definition of stem cells - Types of stem cells (totipotant, pluripotant, multipotant) - Source of stem cells (adult ,fetal, and embryonic) - Parthenotes as a source of stem cells (Haploid and diploid parthenotes) - Stem cells therapies: - 1. neurogenerative diseases: Parkinson's Disease, Alzheimer Disease, Spinal Cord Injury and other brain syndromes - 2. Tissue System Failures; Diabetes (Types 1 and 2), Cardiomyopathy, Kidney failure, cancer and hemophilia	From **Ref#2**
Week 9	Cancer stem cells	From **Ref#1**, From **Ref#2**
Weeks 10, 11, 12, 13	Assisted reproductive technology ? In vitro fertilization and embryo transfer ? Hormonal control of reproduction ? Benefits of IVF ? Procedure of IVF ? Intracytoplasmic sperm injection (ICSI) ? Gamete intra-fallopian injection (GIFT) ? Zygotic intra-fallopian transfer (ZIFT)	From **Ref#1**, From **Ref#2**

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understanding the concept of transgenic animals and their applications [1C]	45%	

Acquiring the knowledge about cloning and stem cells and their applications [1C]	25%	
Familiar with assisted reproductive technology [1C]	30%	

Relationship to Program Student Outcomes (Out of 100%)					
A	B	C	D	E	F
		100			

Evaluation	
Assessment Tool	**Weight**
first exam	30%
Second exam	30%
final	40%

Policy	
Policy 1	1. Your class attendence is mandatory. Absences in excess of 20% of the total lecture hours will result in your being dropped from the course with a failing grade.
Policy 2	2. Make-up exam appeals should be filed within Two days of the missed exam
Policy 3	3. Cell phones are prohibited during examinations and must be turned off during lecture. No incoming or outgoing calls or text messages are allowed
Policy 4	4. Unethical conduct, including cheating during examintions, will result in punishment by the university administratino.
Evaluation	Assessment Type Weight (%) First Exam 25 Second Exam 25 Final Exam 40 Project 10 Total 100

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