



Jordan University of Science and Technology
Faculty of Science & Arts
Biotechnology & Genetic Engineering Department

BT411 Animal Biotechnology
Second Semester 2017-2018

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	Brooks/Cole Thomson,

Course References

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

Instructor	
Name	Prof. Ahmad Bateiha
Office Location	PH1L0
Office Hours	Sun : 09:30 - 10:30 Sun : 11:30 - 12:30 Mon : 10:30 - 11:30 Tue : 09:30 - 10:30 Tue : 11:30 - 13:30 Thu : 09:30 - 10:30
Email	betieha@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 10:30 - 11:30 Room: NF38

Prerequisites		
Line Number	Course Name	Prerequisite Type
962320	BT232 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 (totipotent, pluripotent, multipotent) - 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%	First Exam, Project, Final Exam

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

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

Evaluation	
Assessment Tool	Weight
First Exam	25%
Second exam	25%
Project	10%
Final Exam	40%

Policy	
Policy 1	1. Your class attendance 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

Date Printed: 2018-10-08

An Introduction to Biotechnology is a biotechnology textbook aimed at undergraduates. It covers the basics of cell biology, biochemistry and molecular biology, and introduces laboratory techniques specific to the technologies addressed in the book; it addresses specific biotechnologies at both the theoretical and application levels. Biotechnology is a field that encompasses both basic science and engineering. There are currently few, if any, biotechnology textbooks that adequately address both areas. "Biotechnology"™, the term was coined by a Hungarian engineer, Karl Ereky and is defined as per the UN convention on biological diversity as, "Any technological application that uses biological system or living organisms to make or modify the process or products for specific use." Effusing life to life, through life, is what biotechnology is about. Overview of DNA technology. Ethical questions in biotechnology. Intro to biotechnology. What biotechnology is. Overview of DNA technology. Ethical questions in biotechnology. Google Classroom. Facebook.