



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

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|----------------------------|
| 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                |                                  |
|--------------------------|----------------------------------|
| <b>Title</b>             | . Biotechnology, an Introduction |
| <b>Author(s)</b>         | Susan R. Barnum                  |
| <b>Edition</b>           | 2nd Edition                      |
| <b>Short Name</b>        | Ref#1                            |
| <b>Other Information</b> | 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            | <b>Prof. Ahmad Bateiha</b>   |
| Office Location | PH1L0  |
| Office Hours    | Sun : 09:30 - 10:30<br>Sun : 11:30 - 12:30<br>Mon : 10:30 - 11:30<br>Tue : 09:30 - 10:30<br>Tue : 11:30 - 13:30<br>Thu : 09:30 - 10:30 |
| Email           | betieha@just.edu.jo  |

| <b>Class Schedule &amp; Room</b>                                   |
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| Section 1:<br>Lecture Time: Sun, Tue : 10:30 - 11:30<br>Room: NF38 |

| <b>Prerequisites</b> |                           |                          |
|----------------------|---------------------------|--------------------------|
| <b>Line Number</b>   | <b>Course Name</b>        | <b>Prerequisite Type</b> |
| 962320               | BT232 Basic Biotechnology | Prerequisite / Pass      |

| <b>Tentative List of Topics Covered</b> |   |  |
|---|---|--|
| <b>Weeks</b>                            | <b>Topic</b>  | <b>References</b>                        |
| 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   | <b>Chapter 1</b><br>From <b>Ref#1</b>    |
| Weeks 3, 4                              | Development and use of transgenic animals (Applications) ? Transgenic mice ? Transgenic sheep, goats and pigs ? Transgenic cattle ? Transgenic birds and fish   | From <b>Ref#2</b>                        |
| 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 <b>Ref#2</b>                        |
| Week 6                                  | Cloning: - Embryonic cloning - Therapeutic cloning - Nuclear transfer cloning (Adult cloning) - Applications - Ethics of cloning  | From <b>Ref#1</b>                        |
| Week 7                                  | Embryo Fusion and chimera production  | From <b>Ref#1</b> ,<br>From <b>Ref#2</b> |
| 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 <b>Ref#2</b>                        |
| Week 9                                  | Cancer stem cells   | From <b>Ref#1</b> ,<br>From <b>Ref#2</b> |
| 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 <b>Ref#1</b> ,<br>From <b>Ref#2</b> |

| <b>Mapping of Course Outcomes to Program Student Outcomes</b>               | <b>Course Outcome Weight (Out of 100%)</b> | <b>Assessment method</b>           |
|---|--|------------------------------------|
| Understanding the concept of transgenic animals and their applications [1C] | 45%  | First Exam, Project,<br>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 (%)<br>First Exam 25<br>Second Exam 25<br>Final Exam 40<br>Project 10<br>Total 100   |

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Biotechnology Biotechnology is technology based on biology, especially when used in agriculture, food science, and medicine. The United Nations.Â my.bionity.com. With an accout for my.bionity.com you can always see everything at a glance â€” and you can configure your own website and individual newsletter. My watch list. My saved searches.