

## **Syllabus**

### **Instructor Information**

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### **Course Information**

Course title: Biotechnology and Society

Course number: ENTO 315-500

Course discipline: Natural Sciences

Course description: There are a number of courses on campus that deal with the scientific mechanics of biotechnology; for example, how to make a transgenic plant or manipulate a virus. These require a solid biochemistry and molecular biology background. There are also courses in Bioethics that cover a wide range of topics as well as Economics and Business programs that offer many courses and options. Communication and Education programs have courses that address how to deliver a message. The Biotechnology and Society Course represents an attempt to integrate some aspects of all these topics and angles, with Biotechnology in general forming the background.

The course is composed of a series of lectures designed to ask and answer questions.

There will be section in each lecture to address technical aspects and terminology to build base scientific knowledge.

The mid-term exams are based on the breadth of biotechnology knowledge and understanding of technology and terminology.

The Final paper will describe a future biotechnology application including a discussion and critique of issues. Prior to final submission, each person will give a brief presentation to the class. Peer assessment will also be utilized.

Bonus points are available by completing reviews and critiques of web sites, popular press articles, scientific papers.

In class participation will be graded with the goal being for each student to participate in an intellectual discussion and make the course enjoyable.

Course dates: Jan 14, 2014 through May 7, 2014

Location: HPCT 123

Meeting day(s): TR

Meeting time(s): 12:45pm – 2:00pm

Prerequisite(s): Junior or Senior Classification

### **Course Goals**

Course Goals

To provide a balanced risk vs. benefit assessment of biotechnology from a scientific perspective.

Allow students to independently assess and critique information provided from a variety of sources.

Enable students to become effective communicators of this information to others.

Not the Purpose of the Course

To convince students that biotechnology is the only answer to the worlds problems.  
To convince students that there is no risk involved with biotechnology applications.  
To promote the views and opinions of biotechnology companies.

### **Student Learning Outcomes:**

1. Describe biotechnology advances, techniques and biological components  
Assessment: Weekly assignments, mid-term exam questions.
2. Perform a risk-benefit assessment of biotechnology advances from multiple perspectives.  
Assessment: Weekly assignments, mid-term exam questions.
3. Formulate a novel biotechnology advance and perform a critique of this advance.  
Assessment: Final Paper
4. Effectively communicate biotechnology advances to a lay person audience.  
Assessment: Oral Presentations, Final Paper
5. Write lay person critiques of biotechnology articles.  
Assessment: Extra Credit Assignments.

### **Policies**

**Americans with Disabilities Act:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If a student believes he or she has a disability requiring an accommodation, he or she should contact the Office of Support Services for Students With Disabilities in Room 126 of the Koldus Building (845-1637) so that such accommodation can be made.

**Scholastic Dishonesty and Attendance:** Student rules governing class attendance and scholastic dishonesty, including plagiarism, can be found on the Texas A&M University Website, under Student Rules 2002-2003 at <http://student-rules.tamu.edu/>.

**Aggie Honor Code:** An Aggie does not lie, cheat, or steal, or tolerate those who do. Academic misconduct, a violation of the Texas A&M Honor System, involves any of the following: cheating, fabrication, falsification, multiple submission, plagiarism, and complicity. For explanations and examples visit <http://www.tamu.edu/aggiehonor>

**Make-up Exams:** These will only be provided for official University sanctioned excused absences. The make-up exams will be oral or written exams at a time and in a format to be determined by the instructor.

**Late Assignments:** Up to 100% Late penalties will be applied to all assignment that are not submitted on time.

### **Textbook**

Recommended reading: *Understanding Biotechnology*, Borem, Santos & Bowen,

Prentice Hall, 2003, 0-13-101011-5

### **Course Requirements**

Introduction Assessment will be based on assignments, mid-term exams, class participation, peer evaluation and a final paper. Bonus points are available by completing critical reviews of biotechnology websites, popular press articles or scientific journal articles.

**Requirements Assignments (20%)** - There are 12 assignments to be completed.

**Mid-term Exams (10%, 20%)** - Mid-term exam #1 will cover the material leading up to that exam. Mid-term exam #2 will cover the material following the first exam. Make-up exams will only be given for official University sanctioned excused absences. The make-ups will be oral exams at a time to be determined by the instructor.

**In class participation (10%)** - This will be a combination of attendance, participation in class discussions, final paper presentations.

**Peer Evaluation (5%)** - The final papers will be evaluated by your peers.

**Final Paper (35%)** - The due date for this paper will be determined by the in class presentation date.

#### **Bonus Points (up to 15%)**

**Web Site (up to 2%)** - Submit a web site link and critical review (will only accept 3 independent submissions from each site)

**Popular Press Article (up to 5%)** - submit a critical review of a current popular press article (within the last 6 months, will only accept 3 independent submissions about the same article)

**Scientific Article (up to 8%)** - Submit a layperson summary of a scientific advance in biotechnology that has been published in a peer review journal within the last 6 months.

### **Grading Scheme**

A – 90%-100%

B – 80%-89%

C – 70%-79%

D – 60%-69%

F – 0-59%

## **Lecture Schedule**

- 1 - Introduction to Biotechnology
- 2 - What are the real and perceived risks of Biotechnology?
- 3 - What are the real and perceived Benefits of Biotechnology?
- 4 - What are the medical applications of biotechnology?
- 5 - What are the medical applications of biotechnology?
- 6 - What are the environmental applications of biotechnology?
- 7 - How do selective breeding programs produce improved strains of crops and animals?
- 8 - Exam #1
- 9 - What is a genetically modified organism?
- 10 - How do GMOs differ from traditional breeding strains?
- 11 - How do GMOs differ from traditional breeding strains?
- 12 - What are the risks associated with GMOs?
- 13 - What are the benefits associated with GMOs?
- 14 - How are GMOs regulated?
- 15 - How are biotechnology, politics and big business connected?
- 16 - What is the future of GMOs and biotechnology?
- 17 - Exam #2
- 18 - Class Meeting to discuss final paper topics and presentations.
- 19 - Class Meeting to discuss final paper topics and presentations
- 20 - Presentations - Papers 1-4
- 23 - Presentations - Papers 5-8
- 24 - Draft Papers Due
- 25 - Peer Evaluations Due
- 26 - Final Papers Due