Biotechnology, People and the Environment (3 credits)  
(CFAN 1501) – Spring Semester 2014  
Syllabus

Time and Location
Classes meet in Ruttan Hall B25 on Monday, Wednesday, Friday from 11:45 am to 12:35 pm throughout spring semester. Students should plan to attend every class, because new material not found in the readings or handouts is presented each day and this material is important for tests and assignments. Unless otherwise announced, students should come to class ready to discuss readings that were assigned for that date.

Faculty and Staff
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Plant Pathology  
Plant Biology  
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Melissa Palmer  
Animal Science  
612-625-1814 / 317B Hacker Hall  
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Note: Instructors are frequently available to answer e-mail questions if this is more convenient for you. Also, instructors can generally meet with students before/after class to answer student’s questions.

Learner Outcomes

Biotechnology, People, and the Environment will teach you:
• How to clone a gene.
• How to genetically modify microbes, plants, and animals.
• What is possible, and what is not possible, using current tools of biotechnology.
• How biotechnology impacts society.
• How biotechnology impacts the environment.
• How different people view biotechnology.
• How biotechnology influences -- and is influenced by -- ethical, legal, economic and social issues.
Goals and Objectives

*Biotechnology, People and the Environment* (CFAN 1501) is a non-technical introduction to biotechnology and genetic engineering with a special emphasis on their impact on food, agriculture, the environment, and human health.

CFAN 1501 is organized into four sections: 1) a brief overview of genetic engineering and genomic technology; 2) the biotechnology of plants, highlighting genetically modified foods and crops as well as the creation of biofuels and bioproducts; 3) the biotechnology of microbes, highlighting bioremediation of pollution, biocontrol of environmental organisms, and the microbiology of food products and 4) the biotechnology of human and animal health, emphasizing biopharmaceuticals, genetic screening, stem cells, genome sequencing, animal cloning, bioterrorism, and gene therapy.

*Biotechnology, People, and the Environment* fulfills the **Technology and Society theme of the Council on Liberal Education** (CLE). Each section of the class explores measurable impacts of biotechnology on contemporary society.

*Biotechnology, People, and the Environment* also fulfills the **Interdisciplinary Requirement** for undergraduate programs in the College of Food, Agriculture and Natural Resources Sciences (CFANS).

With this in mind, CFAN 1501 includes the following:

- Commonalities among the questions and technologies across disciplines
- Motivations behind biotechnological innovation
- Real world impacts of biotechnology including unintended consequences
- Critical and quantitative evaluation of risk
- The role of society in driving biotechnology development
- Contrasting perspectives toward biotechnology
- Ethical dilemmas arising from biotechnology
- Intellectual property and its relation to biotechnology.

Students are challenged to develop their own fact-based ways of thinking about biotechnology, to recognize the impacts of biotechnology broadly in the world around them, and to appreciate the role that society plays in the creation, utilization, adoption, and response to new biotechnologies. Students are also

**Moodle Page**

https://ay13.moodle.umn.edu/course/view.php?id=8012#section-0

*(Best to access through your own X500 password and Moodle link)*

**Textbook and Readings**

The textbook for CFAN 1501 in 2014 is *INTRODUCTION TO BIOTECHNOLOGY* 3rd Edition (ISBN 0-321-76611-3), available through the University Bookstore as well as from on-line book suppliers. Paperback, used, electronic, and rented versions of this textbook are acceptable. No matter what medium you choose, it is essential that you are able to find the correct page numbers for reading assignments.
Additional readings for CFAN 1501 come from the World Wide Web and are accessed as links through the course Moodle site.

**Students also need to have iClicker-2** (available from the University Bookstore) for participation during in-class activities and quizzes. If you already own an iClicker-2 from a different class, there is no need to buy another specifically for CFAN 1501.

**Grading (REVISED 2/5/14)**

Grades for the course will be determined based on the following exams and assignments (details provided below):

- 100 points: Recombinant DNA and Plant Biotechnology Exam
- 100 points: Animal & Human Biotechnology Exam
- 100 points: Microbial Biotechnology Exam
- 40 points: Plant Biotechnology Journal
- 40 points: Microbial Biotechnology Journal
- 50 points: Consumer Perception Activity
- 80 points: iClicker activities (4 points each; lowest two scores will be dropped)
- 40 points: Special activities (4 points each; lowest score will be dropped)

- TOTAL: 550 points

Sorry, CFAN 1501 does not include an option for extra credit or re-submitted homework.

Letter grades in CFAN 1501 are then calculated by the following formula:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>94.00 and above</td>
</tr>
<tr>
<td>A-</td>
<td>90.00 - 93.99</td>
</tr>
<tr>
<td>B+</td>
<td>87.00 - 89.99</td>
</tr>
<tr>
<td>B</td>
<td>83.00 - 86.99</td>
</tr>
<tr>
<td>B-</td>
<td>80.00 - 82.99</td>
</tr>
<tr>
<td>C+</td>
<td>77.00 - 79.99</td>
</tr>
<tr>
<td>C</td>
<td>73.00 - 76.99</td>
</tr>
<tr>
<td>C-</td>
<td>70.00 - 72.99</td>
</tr>
<tr>
<td>D+</td>
<td>65.00 - 69.99</td>
</tr>
<tr>
<td>D</td>
<td>60.00 - 64.99</td>
</tr>
<tr>
<td>F</td>
<td>59.99 and below</td>
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I - Assigned at the discretion of the instructor. This grade can only be given when, due to extraordinary circumstances, a student is prevented from completing the work of the course on time, but has already completed a significant portion of the class.

**PLEASE NOTE:** For all written assignments (such as the Personal Reflections and Consumer Perception) as well as essay questions on exams, grading will be guided by the following formula:

- 25% Scientific Accuracy
- 25% Depth
- 25% Creativity and Overall Impression
- 25% Writing Quality

**ALSO:** Organization, legibility, spelling and grammar are taken into consideration in
grading assignments! Students should always leave a 1.5” margin on the left side of any homework or essay question answer to provide space for the instructor's comments. Homework assignments should be typed.

Grade Disputes
Students who feel an assignment has been graded incorrectly should submit a written or email explanation within one week of having the assignment returned. Grades cannot be disputed more than one week after an assignment or exam is returned. If the disputed grade is a matter of opinion, the entire assignment or exam will be given to the two other instructors for re-grading. Their decision will be final. Errors due to a simple miscalculation can be corrected immediately. The Student Dispute Resolution Center is also available to help resolve grade conflicts.

ASSIGNMENTS

Biotechnology Journals and Personal Reflections
Biotechnology Journals and Personal Reflections are intended to illustrate the impact of biotechnology on people, society and the environment and to provide additional insights into debates involving biotechnology. For the Plant and Microbial sections, you will create a journal consisting of four entries that are based on your understanding and interpretation of specific web-readings assigned for class. For the Animal/Medical biotechnology section, Personal Reflections will be assigned on a weekly basis and announced by the instructor.


Public Perception Homework
The purpose of the Public Perception Assignment is for you to discover more about how people outside of class feel about controversial issues in biotechnology. In the process, you will need to learn how to communicate effectively about these issues. Much of the assignment will be performed individually outside of class. On the day the homework is due, everyone’s results will be collected and discussed in small groups and by the entire class. This will provide a sample of society's attitudes towards biotechnology.

Due Date: May 5

PLEASE NOTE: Assignments handed after the deadline will be reduced one letter grade. Assignments handed in two business days late will be reduced two letter grades. No late assignments will be accepted after two business days without a written valid excuse and permission of instructor.

Exams
Recombinant DNA and Plant Biotechnology Exam (February 24)
The exam will be primarily fact-based and focused on recombinant DNA technology and the principles of plant biotechnology. There will be a combination of multiple choice, short answer and essay questions.

Microbial Biotechnology Exam (April 2)
The exam will be primarily fact-based and focused on microbial biotechnology. There will be a combination of multiple choice, short answer and essay questions.

Animal & Human Biotechnology Exam (May 9)
The exam will be primarily fact-based and focused on animal and medical biotechnology, though there will be at least one question "integrating" bioethics and/or environmental ethics from the entire course. There will be a combination of multiple choice, short answer and essay questions.

**Excused Absences**

All students are expected to be present on the days of exams. **There are no make-up exams except for unusual circumstances.** However, University policy does provide for make-up exams for students in cases of legitimate absences. Students should provide a written explanation to the instructor as far in advance as possible and certainly no more than three days after the exam. Instructors will determine whether the absence is excused. Written documentation from a physician, clergy, funeral director, coach or academic adviser will help to validate requests for an excused absence. **In cases of an excused absence, faculty may decide to schedule a special, essay question only exam for students with an excused absence.** Alternatively, faculty may decide to excuse students from one exam (and no more) during the semester, in which case the student's final grade will be calculated on the basis of the other exams during the course.

**Class Participation**

Attending and participating in class on a regular basis is essential for succeeding in Biotechnology. Subjects presented in class are explored in further detail through student discussion and are generally the topics covered most on exams.

To encourage class participation throughout the semester, instructors will assign frequent iClicker-2 activities during class, often for credit, so you need to participate every time. Many iClicker-2 activities will be in the form of quizzes that test student learning. Quiz and Participation activities are included in calculating final grades, with the lowest quiz score and two lowest participation grades dropped from the final grade calculation.

**Scholastic Conduct**

All students in CFAN 1501 are expected to do their own work, though group activities and discussion among students is strongly encouraged. To make it clear what types of activities are **not acceptable** in class, here is a summary of the University of Minnesota Student Handbook on Scholastic Conduct:

“cheating on assignments or examinations; plagiarizing, which means misrepresenting as your own work any part of work done by another; submitting the same paper or substantially similar papers to meet different course requirements without the approval and consent of all instructors concerned; depriving another student of necessary course material; or interfering with another student's work.”

None of these activities will be tolerated in CFAN 1501. Any scholastic misconduct will lead to failure or expulsion from class.

Students are also reminded that disrupting class is disrespectful to other students and can lead to dismissal from that class period. Repeated problems can lead to expulsion.
from class. The use of cell phones, tablets or laptops on activities unrelated to CFAN 1501 is not permitted. Cell phone conversations can never occur during class and cell phones can only be used in class as part of ChimeIn activities. There will generally be a second instructor in class to help ensure that student attention remains focused on class.

Students who violate these rules or disrupt the learning environment for others will be dismissed from class, may receive a reduced final grade, and are potentially subject to disciplinary action.

Old Exam File
An old exam file, including the questions for exams over the past few years, is available on-line. These exams give students an indication of the kind of questions to expect on this year's exam. Keep in mind, new exams are prepared each year, so the old exams should be treated only as an indication of the types of questions to expect.

Help Sessions (TBA)
Just before each exam, help sessions are scheduled for students who feel they need a little more preparation for assignments or the final exam. Help sessions will be scheduled to take place during regular class times.

Disabilities
Students who have any type of disability will be accommodated as much as possible. For assistance, please contact University Disability Services (612-624-4037) or one of the instructors.

This syllabus is available in alternative formats upon request.