COURSE NAME; NUMBER; SEMESTER; MEETING DAYS, TIMES, AND PLACE.
Ethical and Scientific Challenges in Biotechnology
11:126:111     Spring 2020
time tbd
location 138A Foran Hall

CONTACT INFORMATION:
Instructor(s): Paul Meers and tbd
Office Location: 272 Foran Hall
Phone: 848-932-6230        Email: paul.meers@rutgers.edu
Office Hours: tbd

COURSE WEBSITE, RESOURCES AND MATERIALS:
- Website will be set up on the Canvas system as per RU recommendation

COURSE DESCRIPTION:
The purpose of this course is to survey the methods and applications of biotechnology and to examine the consequences of developments in this area. This is an area of great public interest with a pressing need for informed debate. The course is organized by topic and covers many aspects of biotechnology, including those that relate to animals, plants, microbes, human health, agriculture, medicine and the environment. A specialist guest lecturer will introduce each topic with a lecture and lead the subsequent class discussion. Students learn about the scientific basics from the textbook Introduction to Biotechnology and will also investigate and present viewpoints on ethical issues in various fields of biotechnology.

LEARNING GOALS:

Course learning goals:

Upon training in this course students will:

1. have knowledge of the basic approaches to biotechnology research and development, and the wide range of biotechnology applications, including a basic knowledge of the scientific method.
2. be able to address ethical and societal issues relevant to controversial applications of biotechnology.
3. have gained basic oral and written communications skills in the sciences.

This course addresses the following Biotechnology program learning goals:

As a Biotechnology Major, each student will:
1. be able to describe the basic molecular concepts essential for understanding the field of biotechnology and the applications of biotechnology.
2. be able to find and read published scientific research in biotechnology and summarize and communicate that research effectively and critically.
3. acquire knowledge of ethical aspects of biotechnology and be able to analyze alternate viewpoints.
4. learn to work as a team in the laboratory setting or group presentations.

ASSIGNMENTS/RESPONSIBILITIES, GRADING & ASSESSMENT:

1. Weekly readings from a textbook on basic biotechnology applications are assessed by weekly quizzes (40% of final grade).
2. Students give oral presentations on ethical and societal aspects of biotechnology in small group format (3-4 students per group); oral presentations comprise 20% of the grade for the course.
3. Students who are not making the group presentation in any particular week will have material to read related to the topic presented that week and will be asked to submit 1 paragraph on the subject, answer a small number of questions and submit a list of 3 questions that they may ask in class. These students will be allowed to submit these assignments each week individually or as a presentation group (5% of grade).
4. Class participation (not presenting) in group discussions is recorded and assessed as 5% of the student grade.
5. A final term paper project assesses student ability to write about one current aspect of biotechnology and the societal issues surrounding it (30% of grade).

ADDITIONAL DETAILS:
Weekly quizzes (40%). For 9 class periods, there will be a reading assignment from the required textbook Introduction to Biotechnology, 4th Edition, by W. J. Thieman and M. A. Palladino. Although this textbook is relatively expensive to purchase new, used textbooks are cheaper and there are two copies on reserve at Chang library that can be checked out for free, or the text can be rented for the semester from either Amazon or Barnes & Noble (Amazon or B & N). For each reading assignment, there will be a short in-class quiz at the beginning of the class period to assess your familiarity with the material in the chapter. There will be no make-up quizzes, but the lowest quiz grade for the semester will not be included in calculating your course grade. *There will also be 2 homework assignments, which will be worth the same number of points as a weekly quiz.

Individual written project (30%). A writing assignment requiring independent work will be chosen from a set of themes/questions that will be provided. Further details of the project will be given out in week 4 or 5.

Group Activity/Presentation (20%) For one activity, you will work in a group of 3 students to research a topic and present a short skit or role-playing scenario to accompany the week’s
lecture. Each student group will be presented with an outline of the scenario and some ideas for where to begin the research 2 weeks prior to the date of the group presentation.

**ACCOMODATIONS FOR STUDENTS WITH DISABILITIES**
Please follow the procedures outlined at [https://ods.rutgers.edu/students/registration-form](https://ods.rutgers.edu/students/registration-form). Full policies and procedures are at [https://ods.rutgers.edu/](https://ods.rutgers.edu/)
Enter additional text here if you wish

**ABSENCE POLICY**
Students are expected to attend all classes; if you expect to miss one or two classes, please use the University absence reporting website [https://sims.rutgers.edu/ssra/](https://sims.rutgers.edu/ssra/) to indicate the date and reason for your absence. An email is automatically sent to me.

Above is suggested text. Can be deleted. To edit, cut and paste elsewhere. Add your personal or dept’s policies here

**COURSE SCHEDULE:**
Tbd – an expected schedule is shown. The actual schedule depends on when we can get speakers to commit.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic/lecture (weekly class period 1)</th>
<th>Assigned Reading Quiz/Homework (period 2)</th>
<th>Activity/Presentation (period 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Bioethics</td>
<td>None (Chapter 1 recommended)</td>
<td>Discussion on Bioethics</td>
</tr>
<tr>
<td>2</td>
<td>Bioethics and Scientific Method</td>
<td>Chapter 2, An Introduction to Genes and Genomes assignment – Scientific Method</td>
<td>Discussion on Bioethics</td>
</tr>
<tr>
<td>3</td>
<td>Intellectual Property</td>
<td>Chapter 3, Recombinant DNA Technology and Genomics</td>
<td>Discussion, Scientific Method</td>
</tr>
<tr>
<td>4</td>
<td>Plant Biotechnology</td>
<td>Chapter 6, Plant Biotechnology</td>
<td>Group 1 Genetically engineered bananas</td>
</tr>
<tr>
<td>5</td>
<td>Animal Biotechnology</td>
<td>Chapter 7 Animal Biotechnology</td>
<td>Group 2 Cloning Endangered Species</td>
</tr>
<tr>
<td>6</td>
<td>Public Perception of Biotechnology</td>
<td>Assignment – Citations and Plagiarism</td>
<td>Group 3 Labeling of GM Foods</td>
</tr>
<tr>
<td>7</td>
<td>Gene Therapy &amp; Stem Cell Biology</td>
<td>Chapter 11 Medical Biotechnology</td>
<td>Group 4 Gene therapy</td>
</tr>
<tr>
<td>8</td>
<td>Biofuels and Bioconversion</td>
<td>None</td>
<td>Group 5 Biofuels, Bioenergy</td>
</tr>
<tr>
<td>9</td>
<td>Biotech and Pharma</td>
<td>None</td>
<td>Group 6 Pharmacogenomics</td>
</tr>
<tr>
<td>10</td>
<td>Marine Biotechnology</td>
<td>Chapter 9 Marine microbes</td>
<td>Group 7 Hydrothermal vents</td>
</tr>
<tr>
<td>11</td>
<td>Microbial Biotechnology</td>
<td>Chapter 5 Microbial Biotechnology</td>
<td>Group 8 Vaccines</td>
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</table>
**FINAL EXAM/PAPER DATE AND TIME**
Final term paper due the 13th week of the semester (see schedule).

**Absence Policy:** Attendance will be taken during each class period. Students are expected to attend all classes; if you expect to miss one or two classes, please use the University absence reporting website https://sims.rutgers.edu/ssra/ to indicate the date and reason for your absence. An email is automatically sent to us. These absences will be counted as unexcused absences. Absences will be excused only with appropriate documentation, such as a doctor’s note for illness, obituary notice for a funeral of a family member, or similar document provided to the professor for the course section. Studying for an exam, working at a job, attending a social gathering or vacation are not acceptable reasons for an excused absence.

Perfect attendance will be awarded 3 bonus points towards the final grade. 1 or 2 unexcused absences are allowed without penalty. A third unexcused absence will be penalized by subtracting 3 points from the final grade based on 100 points. Each successive absence will result in the loss of 3 additional points.

**ACADEMIC INTEGRITY**
*Turnitin plagiarism detection software will be used to scan assignments for copied and improperly attributed material.*

The university's policy on Academic Integrity is available at http://academicintegrity.rutgers.edu/academic-integrity-policy. The principles of academic integrity require that a student:
- properly acknowledge and cite all use of the ideas, results, or words of others.
- properly acknowledge all contributors to a given piece of work.
- make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that
- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- all student work is fairly evaluated and no student has an inappropriate advantage over others.
- the academic and ethical development of all students is fostered.
- the reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.
COURSE SYLLABUS

Enter optional text or delete. Copy and paste elsewhere if you wish to edit. Here is an example from a syllabus (spring 2010 Andy Egan 01:730: 252 Eating Right: Cheating on tests or plagiarizing materials in your papers deprives you of the educational benefits of preparing these materials appropriately. It is personally dishonest to cheat on a test or to hand in a paper based on unacknowledged words or ideas that someone else originated. It is also unfair, since it gives you an undeserved advantage over your fellow students who are graded on the basis of their own work. In this class we will take cheating very seriously. All suspected cases of cheating and plagiarism will be automatically referred to the Office of Judicial Affairs, and we will recommend penalties appropriate to the gravity of the infraction. To help protect you, and future students, from plagiarism, we require all papers to be submitted through Turnitin.com.

STUDENT WELLNESS SERVICES
The Rutgers University Student Assembly urges that this information be included at the end of every syllabus. Edit or delete as you wish:

Just In Case Web App  http://codu.co/cee05e
Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)
(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ www.rhscaps.rutgers.edu/
CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students’ efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)
(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/
The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services
(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / https://ods.rutgers.edu/
Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus’s disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: https://ods.rutgers.edu/students/registration-form.

Scarlet Listeners
(732) 247-5555 / https://rutgers.campuslabs.com/engage/organization/scarletlisteners
Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.