Syllabus for PB580, Introduction to Plant Biotechnology

Location: http://moodle.wolfware.ncsu.edu/

Instructor: Dr. Niki Robertson, Professor of Plant Biology and Genetics

Office: 360B Partners III, Centennial Campus

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Office Hours: Thurs. 3-5 or by appointment (can include Elluminate meetings, Skype, telephone, texting)

Office: 360B Partners III, Centennial Campus. I can also meet in 2111 Gardner Hall (by appointment only)

Textbook: There is no required textbook. Readings will be hyperlinked to the course home page. Recommended supplementary reading: Stewart, Plant Biotechnology and Genetics.

Course goals:

At the end of this course you should be able to:

1. Think critically about issues in Plant Biotechnology.

2. Appreciate the plasticity of plant development during tissue culture and transformation.

3. Understand how to design a transgene for expression in plants and be familiar with some of the problems that can arise during the process of transformation.

4. Be familiar with the regulation and testing of GMOs in the US and other parts of the world.

5. Understand the global dimensions of engineering and marketing transgenic plant products and why patents are important.
**Course Schedule:**

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPICS</th>
<th>FORUM TOPIC</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-11-12</td>
<td>1. Course Orientation</td>
<td>Critical thinking (post by 1/17)</td>
<td>Short biography, due 1/17&lt;br&gt;Questionnaire, due 1/17</td>
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<tr>
<td>1-17-12</td>
<td>2. Tissue Culture Pathways</td>
<td>Webquest (post by 1/23)</td>
<td>Deadline to get approval for term paper topics</td>
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<tr>
<td>1-23-12</td>
<td>3. Plant Transformation</td>
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<td>1-30-12</td>
<td>4. Agrobacterium transformation</td>
<td>GFP (post by 2/6)</td>
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<tr>
<td>2-6-12</td>
<td>5. Microprojectile Bombardment</td>
<td>Enhancing transformation (post by 2/13)</td>
<td>Term paper: Deadline to send a tentative title and 3 references to Dr. Robertson</td>
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<td>2-13-12</td>
<td>6. Herbicide Resistance</td>
<td>Should we ban glyphosate? (post by 2/20)</td>
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<tr>
<td>2-20-12</td>
<td>First Midterm, Take-home Exam</td>
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<tr>
<td>2-27-12</td>
<td>7. Insect Resistance</td>
<td></td>
<td>First case study, due 3/5</td>
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<td>3-5-12</td>
<td>Spring Break</td>
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<tr>
<td>3-12-12</td>
<td>8. Preventing Transgene Escape</td>
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<td>Second case study, due 3/19</td>
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<td>3-19-12</td>
<td>9. Gene Silencing</td>
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<td>Position paper: Deadline for topic approval</td>
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<td>3-26-12</td>
<td>10. GMO Regulation, Safety</td>
<td></td>
<td>Term paper due 3/26&lt;br&gt;Third case study, due</td>
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Term Paper: Choose any area of plant biotechnology. The paper should be ~10 pages long, double-spaced, and have at least 10 references cited correctly. One of these references should be primary literature, and your paper should discuss the experimental results of this paper. A critical evaluation of the overall topic with respect to science and technology is expected. You are also expected to prepare a presentation using Powerpoint (or equivalent) that will be used to introduce the rest of the class to your topic. Presentations will be peer-reviewed.

Position Paper: This assignment distinguishes PB480 and PB580 and is only required for PB580. A position paper is used to discuss the advantages and disadvantages of a legal action, an issue, or a controversial topic. Your paper should focus on one issue in plant biotechnology and should be about 5 pages long with 3-5 references. You should introduce the topic, present both positions, and then come to a conclusion (usually supporting one of the positions). Your paper should be logical, presenting reasons for and against certain positions. I would also like you to prepare a summary of your paper for the rest of the class to read. The summary should be about 250 - 500 words and can be the first part of your paper.

Discussions: This class will be taught through active discussions. Critical thinking skills are expected to be honed and used. 15% of your grade will depend on your participation in the discussions.
**Exams:** All exams are open book/internet, but I expect you to work on the exams individually. There will be two midterms and a final.

**Grades:**

Discussions - 15%

Midterms - 20%

Term Paper - 25%

Paper presentation - 5%

Critique of others presentations - 5%

Position Paper - 10%

Case studies - 10%

Final Exam - 10%

**Grade cut-offs for the exams are as follows:**

A+ = 98%, A = 94%, A- = 90%

B+ = 88%, B = 84%, B- = 80%

C+ = 78%, C = 74%, C- = 70%

D+ = 68%, D = 64%, D- = 60%

F = below 60%

**University Policies**

Academic Integrity: Guidelines set forth in the NCSU Policy on Academic Integrity will be strictly followed. In particular, sections 8 - 10 should be reviewed if there is any doubt as to what constitutes plagiarism or cheating. It is imperative that citations be used properly in scientific writing, and that credit is given to the original source of definitive ideas and data.

**Students with Disabilities:** If you need additional accomodations with respect to this course, please see the instructor as soon as possible. Resources at NCSU are available at the Disability Services Office, a unit of the Office for Equal Opportunity.

A grade of **Incomplete (IN)** will be given only if there is a significant and verifiable disruption in your work.