BIOL 509 PLANT BIOTECHNOLOGY (4)
Three hours of lecture and three hours of laboratory per week.
Prerequisites: BIOL 400 and BIOL 422 or permission of instructor
This course will examine the scientific and technical advances which underlie the production of genetically modified crops. Topics include: plant genome organization and gene expression, plant tissue culture and genetic transformation, genetic manipulation to confer resistance to herbicides, pests and disease and strategies for engineering stress tolerance and the improvement of crop yield and quality.

2. Mode of Instruction.

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<thead>
<tr>
<th>Mode</th>
<th>Units</th>
<th>Hours per Unit</th>
<th>Benchmark Enrollment</th>
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<tbody>
<tr>
<td>Lecture</td>
<td>3</td>
<td>1</td>
<td>15</td>
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<tr>
<td>Seminar</td>
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<tr>
<td>Laboratory</td>
<td>1</td>
<td>3</td>
<td>15</td>
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<tr>
<td>Activity</td>
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3. Justification and Learning Objectives for the Course. (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) [Use as much space as necessary]

   Plant Biotechnology is an elective course for graduate students in the Professional Master of Science Degree Program in Bioinformatics.

   Students who successfully complete this course will be able to:
   
   • Describe plant genome organization and the mechanisms of gene expression in plants
   • Explain how plant tissue is cultured
   • Explain how genetic manipulation can be used to confer resistance to herbicides, pests and disease
   • Describe how crop yields and quality can be enhanced using genetic modifications

4. Is this a General Education Course

   If Yes, indicate GE category:
   
<table>
<thead>
<tr>
<th>Category</th>
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<tbody>
<tr>
<td>A (English Language, Communication, Critical Thinking)</td>
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<tr>
<td>B (Life Sciences)</td>
</tr>
<tr>
<td>C (Fine Arts, Literature, Languages &amp; Cultures)</td>
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<td>D (Social Perspectives)</td>
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<td>E (Human Psychological and Physiological Perspectives)</td>
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5. Course Content in Outline Form. [Be as brief as possible, but use as much space as necessary]

   Plant genomes - the organization and expression of plant genes
   Plant tissue culture
   Techniques for plant transformation
Binary vectors for plant transformation
The genetic manipulation of herbicide resistance
The genetic manipulation of pest resistance
Plant disease resistance
Reducing the effects of viral diseases
Strategies for stress tolerance
The improvement of crop yield and quality
Molecular farming or "pharming"
Future prospects for GM crops

6. References. [Provide 3 - 5 references on which this course is based and/or support it.]

7. List Faculty Qualified to Teach This Course.

Biology Faculty

8. Frequency.
a. Projected semesters to be offered: Fall ____ Spring ____ X ____ Summer ____

9. New Resources Required.
a. Computer (data processing), audio visual, broadcasting needs, other equipment
b. Library needs
c. Facility/space needs

10. Consultation.
Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

_______ Nancy Mozingo ________________________ 31 October 2003 ___________________________
Proposer of Course Date