SPSS 3240/5240 Plant Biotechnology (Spring, 2010)

Instructor and his office: Yi Li  E-mail: yi.li@uconn.edu Phone: 486-6780,
Office: Hampton Building, UConn Depot Campus
Text: The instructor will provide handouts and other reading materials
Time and location: 11:00AM-12:15PM, Tuesday and Thursday, 109 W. B. Young
Office Hours: By appointment, the office at Hampton Building of Depot Campus

Grading:

Mid-term in class exam**: 100 points
Take-home exam***: 200 points
Oral Presentation****: 75 points
Class attendance and participation*****: 75 points
Total: 450 points

* Graduate and undergraduate students will be graded differentially.
** In class, closed-book exam.
*** Take-home exam will be handed in and graded three times. The instructor will provide help as needed.
**** You will select a scientific research publication provided by the instructor and do an oral presentation based on the publication. You need to have a thoroughly understanding of the publication and prepare and give a 20-30 min power-point presentation to the class. The instructor will provide you all needed help.
****** Because of no text books used, your attendance is essential for you to learn. The instructor will have an attendance sheet to track class attendance. Each student will be allowed to miss two classes to cover any unexpected events or emergencies. If one misses 3 classes, he/she will lose 20 points. If you miss 4 classes, you will lose 45 points. If you miss 5 classes, you will lose 75 points. If you miss 6 or more classes, you will automatically fail the course.

Course Description:
To introduce the scientific principles that underlie transgenic plant technology, and to illustrate how transgenic plant technology are being and can be applied in agriculture, horticulture, forestry, bioenergy production, human and animal health care, and environment clean-up and protection. Transgenic plant technology is moving from the laboratory to the field and beginning to make a significant impact on our society. While some believe this is a revolution, others see it as the dawn of a dangerous "Brave New World". After taking this class, you should be more informed about the newest developments in the field of transgenic plant technology and its impacts, and be able to take an educated position on many controversial issues around the technology.

Course Contents:

--Basic concepts of recombinant DNA and transgenic plant technologies
  --Plant gene structure, expression and regulation of expression
  --Principles of recombinant DNA technology
  --Production of transgenic plants
  --Reporter genes and their utilities
  --Comparison of plant genetic engineering and traditional crop breeding

--Plant gene transfer and improvement of agriculture/horticulture
  --Resistance to insects and pathogens
  --Tolerance to environmental stresses (e.g., drought and cold)
  --Extension of shelf life of ornamentals, fresh vegetables and fruits
  --Changes in growth habit and appearance of ornamental plants
  --Carbohydrates metabolism and improvement of yield of crop plants

--Transgenic plant technology and its applications in non-traditional agricultural areas
  --Human/animal health care (e.g., vitamin-enriched fruits and oral vaccines)
  --Production of industrial and medical enzymes and proteins
  --Phytoremediation (e.g., removal of mercury from soil)
  --Energy production and forestry

--Controversial issues, potential negative impacts and possible solutions
  --Ecological impacts (e.g., Bt and butterflies, edible vaccines)
  --" Terminator seed" and "gene deletor" technologies