PLANT BIOLOGY -- B0 250 --Fall 2006

Class meetings: Tues. and Thurs. 11:45 a.m. - 1:00 p.m. **Location: GA 2213**
Lab: Mon. sec 201 1:30 - 4:15 pm **Location: BOS 4706 D**
Wed. sec. 202 1:30 - 4:15 pm

OVERVIEW: This course introduces the student to the basics of plant biology including plant diversity, structure, physiology, metabolism, reproduction, genetics, evolution and ecology. Perquisites are BIO 181 and 183 or their equivalent. You will have the same instructor for lecture and lab. There will be a field trip and fantastic videos on plant life. The lab has new state of the art equipment with which you can do tissue culture, photosynthesis and nitrogen fixation experiments. See list of **COURSE OBJECTIVES** on page 3 of Syllabus.

TEXTS and MATERIALS:

Required:
Biology of Plants 7th ed.
by Raven, Evert and Eichhorn

BO250 Course Pac FALL 2006 by Barbara Thakor

Optional:
A Photographic Atlas for the Botany Laboratory
by Van De Graaff, Rushforth and Crawley

TESTS and GRADING: There will be two tests and one final exam. Each of the two tests will cover material presented since the preceding test. The final exam will cover all material presented since test 2 as well as include a comprehensive review of all material in the course. Some written assignments are given during the course.

The final course grade in credits (based on 1000 total credits) will be determined as follows:

TEST 1	150 credits
TEST 2	250 credits
FINAL EXAM (comprehensive)	250 credits
Lab Written Assignments:	
Field Trip -NCSU Conservatory	40 credits
Scientific Paper - Tissue Culture	40 credits
Paper - Photosynthesis	35 credits
Paper - Nitrogen Fixation	35 credits
10 Videos - Hill Library Media Center	150credits
Attendance	50 credits

FINAL GRADES: **Final Letter Grades are determined as follows**:

A+ = 961 - 1000; A = 901 - 960; A- = 891 - 900;
B+ = 851 - 890; B = 801 - 850; B- = 791 - 800;
C+ = 751 - 790; C = 701 - 750; C- = 691 - 700;
D+ = 661 - 690; D = 611 - 660: D- = 600 - 610;
F = below 600

ABSENCES: You are expected to attend all lecture and lab sessions. **It is assumed that, when you enrolled in this course, you had arranged the time in your schedule to be present at every lecture and lab session. Lab cannot be made up, and an absence from lab is also an absence from the assignments that are dependent on that lab.** Attendance will be recorded and absences will be reflected in your final grade (see grading above). You will be allowed 2 non-excused lecture absences. After that, an absence from lecture deducts **5** credits and an absence from laboratory deducts **15** credits from the total allowable attendance credits of **50** credits. There are no non-excused lab absences. Only documented emergencies will be accepted as excused absences and such must be verified in writing from an acceptable, competent authority, e.g., medical doctor, police, etc. or prior permission from your instructor.

Credit is deducted for any unexcused late assignments at the rate of one credit per class day.

INSTRUCTOR: **Dr. Barbara H. Thakor**

email: barbara_thakor@ncsu.edu (**the preferred method for contacting me**)

tel. (919)515 - 8787 (office at NCSU) or (919) 968 - 1517 (home)

Office hours: I will be available at NCSU on Mon - Thursdays from around 10 a.m. until about 5 p.m. You are welcome to come to my office anytime or telephone or email to arrange for an appointment.

Office location: Gardner Hall GA4203

RULES: Keep cell phones **turned off** while you are in lecture and lab. No food or drink is allowed in the lab room.

HONOR CODE: You are expected to adhere strictly to the Academic Integrity Policy of NCSU. For details consult:
http://www2.ncsu.edu/ncsu/provost/info/hat/current/appendix/appen_l.html

Reasonable accommodation will be made for any disabled student. The student must provide written verification of disability from NCSU Disability Services for Students (Rm 2000 Harris Hall, 515-7653).

BO 250 COURSE OBJECTIVES

When you complete BO 250, you should

- **have removed all vestiges of ZOOCENTRISM from your mindset**

- **be able to formulate a definition of a PLANT in terms that distinguish the plant from all other life forms**

- **understand why plants are the life source for food and oxygen for all organisms of terrestrial earth**

- **understand the significance of the diplobiontic life cycle of plants and be able to explain why gametes are produced in plants by mitosis**

- **appreciate the intricate biochemical workings of plants including those of photosynthesis, cell respiration, and hormone action and recognize how the underlying molecular, cellular and tissue organization makes these possible**

- **be aware of the role external environmental factors play in producing internal responses in plants**

- **be able to appreciate the richness of plant diversity resulting from eons of evolution**

- **be able to understand some unique speciation modes of plants**

- **be able to enter a forest, other natural area or your own backyard and distinguish the plants you encounter as being either Bryophytes, Pteridophytes, Gymnosperms or Angiosperms**

LECTURE SYLLABUS -- BO 250
FALL 2006

DATE	TOPIC of the day	ASSIGNMENT from Raven et. al. (entire chapter unless otherwise noted)
Aug 24 Th	Introduction to course; What is a plant? Zoocentrism	Chap. 1&2
Aug 29 Tu	Time line, prokaryotes, eukaryotes, Serial Endosymbiotic Theory; Domains of Life	Chap. 12
Aug 31 Th	**Cells, membranes, walls**	Chap 3 & 4
Sep 5 Tu	**Cell Metabolism:** Glycolysis and cell respiration	Chap. 5 and 6 to p. 105
Sep 7 Th	**Cell Metabolism:** (continued)	Chap. 6 p.105 to end
Sep 12 Tu	**Cell Metabolism:** Photosynthesis - history and light dependent reaction (begin)	Chap. 7 to p. 121
Sep 14 Th	**Cell Metabolism:** Photosynthesis - light dependent reaction (finish); light independent reaction	Chap. 7 to p. 127
Sep 19 Tu	**Cell Metabolism:** C_4 and CAM	Chap. 7 finish
Sep 21 Th	**Genetics:** Plant Genetics	Chap. 8
Sep 26 Tu	**Evolution:** Plant Evolution - Speciation	Chap. 11
Sep 28 Th	**TEST 1**	
Oct 3 Tu	**Diversity and life cycles:** Green algae, Cyanobacteria,	Chap. 12 p. 236; Chap. 13 to p. 247; Chap. 15 to p. 302, 327-340(top);
Oct 5 Th	**Diversity and life cycles:** Bryophytes	Chap. 16
Oct 10 Tu	**Diversity and life cycles:** Vascular Cryptogams	Chap. 17 to p. 389
Oct 12 Th	**FALL BREAK**	
Oct 17 Tu	**Diversity and life cycles:** Vascular Cryptogams (cont.) & Ferns	Chap. 17 p. 389 to end
Oct 19 Th	**Diversity and life cycles:** Coniferophytes	Chap. 18 to p. 427
Oct 24 Tu	**Diversity and life cycles:** Cycadophytes, Ginkgophytes and Gnetophytes	Chap. 18 finish
Oct 26 Th	**Diversity and life cycles:** Angiosperms	Chap. 19
Oct 31 Tu	**Anatomy:** Angiosperms /Early Development	Chap 22
Nov 2 Th	**Anatomy:** Cells and tissues of plant body	Chap. 23

Nov 7 Tu	**TEST 2**	
Nov 9 Th	**Anatomy:** Roots	Chap. 24
Nov 14 Tu	**Anatomy:** Shoots (Stems and Leaves)	Chap. 25
Nov 16 Th	**Anatomy:** Secondary growth in stems	Chap. 26
Nov 21 Tu	**Physiology:** Plant nutrition and Soils	Chap. 29
Nov 23 Th	**THANKSGIVING HOLIDAY**	
Nov 28 Tu	**Physiology:** Movement of water and photosynthate	Chap. 30
Nov 30 Th	**Physiology:** Plant hormones	Chap. 27
Dec 5 Tu	**Physiology:** Tropisms;Turgor changes; Phytochrome	Chap. 28
Dec 7 Th	**Finish** **evaluations**	Chap. 31, 32
Dec 12 Tu	**FINAL EXAM** **8:00am - 11:00am**	

LABORATORY SYLLABUS -- BO 250
FALL 2006

DATE	TOPIC	ASSIGNMENTS from Course Pac, textbook
Aug 28, 30	**Introduction; Lab Safety**	Pac pp. 1 -9 **Video 1**
Sep 4, 6	**No Lab**	
Sep 11, 13	**Plant Biotechnology - Tissue Culture** **Video 1 due**	Pac pp. 10- 17 text pp. 188 - 197 (Biotechnology) **Tissue Culture Paper due Nov 27, 29** **Video 2**
Sep 18, 20	**Cells, Microscope** **Video 2 due**	Pac pp. 18- 28 **Video 3**
Sep 25, 27	**Photosynthesis** **Video 3 due**	Pac p. 29 + APPENDIX ref. **Photosynthesis paper due next lab** **Video 4**
Oct 2, 4	**Evolution** **Video 4 due** **Photosynthesis paper due**	Pac p. 47 Text pp. 198-199 **Video 5**
Oct 9, 11	**Green Algae and Bryophytes** **Nitrogen Fixation paper due** **Video 5 due**	Pac pp. 48 - 61 **Video 6**
Oct 16, 18	**Seedless Vascular Plants** **Video 6 due**	Pac pp. 62 - 77 **Video 7**
Oct 23, 25	**Seed Plants, Gymnosperms** **Video 7 due**	Pac pp. 78 - 91 **Video 8**
Oct 30, Nov 1	**Seed Plants, Angiosperms** **Video 8 due**	Pac pp. 92 - 101 **Video 9**
Nov 6, 8	**Global Plant Diversity Field Trip - NCSU Conservatory** **Video 9 due**	Pac pp. 102 - 115 **Conservatory paper due next lab** **Video 10**
Nov 13, 15	**Plant Anatomy and Morphology** **Conservatory paper due** **Video 10 due**	Pac pp. 33 - 46
Nov 20, 22	**THANKSGIVING HOLIDAYS**	
Nov 27, 29	**Nitrogen Fixation** **Tissue Culture paper due**	Pac pp. 30 - 33 + APPENDIX ref. ; Text pp. 656 - 659 **Nitrogen paper due next lab**
Dec 4, 6	**Ecology** **Nitrogen Fixation paper due** **Anatomy slides review for final exam**	www.whfreeman.com/Raven (chap. 31, 32)

NAME _____ **Lab day** _____

List all biology and chemistry courses you have completed and indicate whether they were taken in High school or college. **Use names not course numbers, please.**

Course Name	H.S. or Coll.

Indicate how well you **know** the following topics:

Topic	well, fairly well, poorly
Mitosis	
Meiosis	
Mendel's pea plant experiments and resulting genetic laws: law of independent assortment and law of segregation	
Darwin and his theory of evolution by natural selection	
Cell structure and function of various cell organelles	
Carbohydrates, fats, protein - differences in atomic makeup and use in cells	
Differences between Monocots and Dicots	
Cell respiration	
Photosynthesis	

Are you acquainted with the format of scientific paper writing e.g., Introduction, Materials, Results, Conclusions? _____

Have you ever written up a lab in the form of a scientific paper? _____

Have you taken BIO181 and BIO183? _____ Grades _____

What is your GPA? _____

What is your proposed major? _____

In which year in college are you currently enrolled? _____

Why are you taking BO250?

What do you like best/least about a lab course?

I have read the syllabus, and understand how grades are to be determined and how attendance is essential and I am willing to abide by the expectations for students in BO250 as stated in the syllabus.

NAME_____ Date _____