

FACULTY of SCIENCE Department of Biology

Course: SC/BIOL 2010 4.0 – Plant Biology

Course Webpage: <http://www.yorku.ca/plants/>

Term: Winter Term 2014/2015

Prerequisite / Co-requisite: SC/BIOL 1010 6.0; or SC/BIOL 1000 3.0 and SC/BIOL 1001 3.0; or Permission of the Course Director.

Course Instructor: Roger R. Lew

(416) 736-2100 ext 66114

Farquharson 229 (lab)

planters@yorku.ca

Course consultation hours: I am usually in my lab, so please feel free to drop by.

Time and Location

Lectures MWF 9:30 LAS (Lassonde) B

Laboratory MTWR 2:30–5:30 and W and R 6:30–9:30 Lumbers 118

Expanded Course Description

Plant Biology - Current advances in plant biology research, highlighting plant structure, physiology, development and diversity. Three lecture hours, three laboratory hours. One term. Four credits.

Overview. This course is an introduction to the field of botany. Non-biology majors with some background in biology may enroll with permission of the Course Director. The lectures will present information about prokaryotes, algae, fungi and plants (structure, function, and diversity; lifecycles; ecology; relevance to human society). The laboratories are integrated with lecture, and illustrate the biological diversity of algae, fungi, and nonvascular and vascular plants, and highlight key aspects of plant biology.

Organization of the Course. The course involves formal lectures by the lecturer and weekly laboratories. The textbook and lectures are central to the course. Lectures serve to enrich, clarify, and illustrate crucial issues from the textbook used to reveal the diversity of photosynthetic organisms and—a major part of the course—the life of a higher plant. Most of the material presented in laboratory exercises focuses on developing the observational skills of the students: observation and recording of gross form and structure (including the life cycle of a fern), and microscopic form and structure. Opportunities to identify material using keys—from algae, conifers to pollen—test and hone the student's observational skills. Some of the lab exercises will require statistical analysis. The lecture and laboratory components are integrated (and usually synchronized). The final grade of the student is compiled from the combination of lecture and laboratory.

Course Learning Objectives. Please note that a detailed syllabus of lecture material and past tests on the course website (www.yorku.ca/plants) provide a detailed and practical presentation of the Learning Objectives

Brief statement of the purpose:

DIVERSITAS

Students will learn the major characteristics of biological groupings commonly compiled together in a plants course: Prokaryotic heterotrophs and autotrophs, Eukaryotic Protist groups emphasizing the autotrophs, the heterotrophic Fungi, and Land Plants. The Learning Objective is fulfilled by integration of lecture and lab components. In Lecture, the students learn the characteristics, economic importance, and evolutionary significance of the various groups. In Lab, students are given the opportunity to observe life cycles of these organisms, from both prepared and living material. The Observational Skills that the students acquire in Lab (including microscopic observation and documentation with drawings) are crucial for their ability to integrate their understanding of biotic diversity in the context of Lecture presentation.

Achievement of the *Diversitas* Learning Objectives is documented by term tests that challenge the student to apply and integrate their knowledge of biotic diversity, and by lab quizzes and write-ups that document their ability to observe and identify major biotic groups.

FORMA VITAE

Students will explore that form and development of an angiosperm, from seed to seed in the context of environmental and physiological cues that control each life stage transition. The Learning Objective is fulfilled by integration of lecture and lab components. In Lecture, the students learn about environmental cues that regulate each life stage transition of a flowering plant and how the plant achieves that transition. In Lab, students are given the opportunity to dissect a plant and explore its internal structures that support survival at each life stage. The Learning Objectives include a transition to independent learning in which analytical thinking is emphasized.

Achievement of the *Forma Vitae* Learning Objectives is documented by term test and final exam that challenge the student to apply and integrate their knowledge of the life cycle of a flowering plant with analytical thinking, and by write-ups that document their ability to observe and explore the plant structures that support survival of the plant.

Brief list of specific learning objectives of the course

The specific objectives of the course are that students will be able to:

- critically examine the diversity of major organismal groups—their characteristics and life cycles
- understand the key evolutionary transitions from photosynthetic microorganisms (cyanobacteria) to protist eukaryotes (unicellular algae) to multicellular complexity (algae, fungi and land plants), and appreciate the remarkable depth and breadth of 4000 million years of evolution.
- develop and hone the observational skills required to identify major organismal groupings
- develop the flexibility required to apply and integrate fundamental principles and mechanisms in the evolution of diverse organisms—both form and function.
- Become familiar with the scientific language used to describe organismal diversity and the ecophysiological basis of the life cycle of a flowering plant.
- develop their ability to independently analyze organismal diversity and the life of a higher plant.

Course Text / Readings

Evert RF and SE Eichorn 2012 Raven Biology of Plants. Eighth Edition.

Raven Biology of the Plants provides an obligatory coverage of photosynthesis, organismal diversity and its evolution and the life cycle of flowering plants.

Lew and others 2014. Laboratory Manual for SC/BIOL 2010 4.0 (Plant Biology).

The laboratory manual provides explanations of each of the lab exercises, diagrammatic representations of diverse life cycles and identification keys for major groups.

Evaluation

- Two term tests and final exam (highest scoring 25%, mid-scoring 20%, lowest scoring 15%)
- Laboratory exercises, write-ups and quizzes (40%). A detailed breakdown of the lab marks are available in the lab manual.

In the event of an absence from a term test, please provide a letter stating that you were absent, and acknowledging that the weight of the missed term test (15%) will be added to the weight of the final exam.

It is not always possible to accommodate missed lab assignments or quizzes, in which case, the weight of the missed lab assignment/quiz will be added to the weight of the final exam.

“Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.”

Grading: The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, C+ = 5, etc.). Assignments and tests* will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.). For a full description of York grading system see the York University Undergraduate Calendar - <http://calendars.registrar.yorku.ca/2010-2011/academic/index.htm>. Students may take a limited number of courses for degree credit on an ungraded (pass/fail) basis. For full information on this option see Alternative Grading Option in the (*Faculty of Science and Engineering*) section of the Undergraduate Calendar: (<http://ugbio.apps01.yorku.ca/>)

Assignment Submission: Proper academic performance depends on students doing their work not only well, but on time. Accordingly, **lab** assignments for this course must be received on the due date specified for the assignment. Assignments are to be handed in to the TA for your laboratory section per their instructions.

Lateness Penalty: Assignments received later than the due date will be penalized (Late penalties will be determined by the laboratory coordinator).

Missed Tests: Students with a documented reason for missing a course test, such as illness, compassionate grounds, etc., which is confirmed by supporting documentation (e.g., doctor's letter) will have the weight of the missed term test transferred to the final exam.

IMPORTANT COURSE INFORMATION FOR STUDENTS

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage (see Reports, Initiatives, Documents) <http://www.yorku.ca/secretariat/senate/committees/ascp/index-ascp.html>

- Senate Policy on Academic Honesty and the Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation