

The University of Manitoba
Faculty of Agricultural and Food Sciences



COURSE TITLE Plant Physiology

Department Plant Science

Course Number PLNT 3500

Academic Session Fall 2011

Credit Hours 3

Prerequisites and how they apply to this course BIOL1020 and BIOL1030; CHEM2770 or MBIO2770 or CHEM2360, or MBIO2360; BIOL2242, or consent of instructor. General knowledge in plant biology and chemistry is crucial for understanding basic physiological processes in plants.

Classroom Location Agriculture Bld 170

Meeting Days and Class Hours MWF 12:30-1:20

Lab/Seminar Location Ag Bld 342

Lab/Seminar/Hours M 2:30-5:25

Department Office location Ag Bld 222 **Phone Number** 8221

Course Web Page (if applicable) N/A

Instructor Information

Name & Title Stasolla (Associate Professor)

Office Location Ag Bld 315

Office Phone Number 6098

Office Hours Students can drop to my office anytime

Email Address stasolla@ms.umanitoba.ca

Teaching Assistant(s) (if applicable) Aaron Chan

TA Office Hours and Location TBD

Course Philosophy

Students' Learning Responsibilities

Students are encouraged to review material covered in previous courses, prerequisites of PLNT 3500. A detailed knowledge related to plant structure and anatomy (BIOL 1020, BIOL1030) and a basic understanding of biochemical processes (CHEM 2770 or equivalent) are expected. Attendance in class is also highly recommended as some of the material covered is not in the textbook.

Why this course is useful?

PLNT 3500 is a key course in plant biology because it explores how physiological processes affect plant behavior. Therefore in order to understand how plants respond to the environment it is important to appreciate plant physiology.

Who should take this course?

Any student interested in having a general knowledge in plant biology.

How this course fits into the curriculum

The course, which covers basic physiological processes related to vegetative and reproductive growth of plants, is important for understanding how plants "work". Therefore it complements information covered by other disciplines of the curriculum, including agronomy, plant pathology, genetics and breeding.

Course Description/Objectives

Undergraduate Calendar Description

The course will provide a comprehensive view of major physiological processes in plants, spanning from biochemical, cellular, tissue, organ and whole plant levels of organization.

Instructional Methods

This is a lecture-based course in which notes will be distributed to the students.

Course Objectives

The objectives of the course are

- 1) to make students aware of basic aspects of plant physiology and appreciate how structure relates to function
- 2) to encourage a multidisciplinary approach to understand plant behavior.
- 3) to understand how any plant response and behavior is governed by plant physiology
- 4) to have an appreciation of how biological processes interact to trigger a response

Learning outcomes

- 1) Ability to critically analyze and summarize scientific information
- 2) Ability to deliver information effectively through written communication
- 3) Creativity in testing specific hypothesis using a multidisciplinary approach
- 4) Ability to prioritize information

Description of Examinations

There are two types of examinations:

- 1) Two tests (midterm and final) in which students will be tested on basic physiological processes
- 2) Lab reports in which students will describe results of specific experiments they have performed in the lab.

Description of Assignments

N/A

Assignment Due Dates

N/A

Grade Evaluation

Lab reports 25%

Midterm 30%

Final exam 45%

Important Dates (e.g., voluntary withdrawal date)

Last day for voluntary withdrawal is Nov 16th 2011

Texts, Readings, Materials

Textbook(s) – Authors, Titles, Edition

L.Taiz and E. Zeiger, Plant Physiology, Fifth Edition, 2002

Additional Materials

Lab manual created by the instructor

Course Policies

Late Assignments

A penalty of 20% per day will be applied for any late lab report

Missed Assignments

A 0% grade will be given for any missed lab report

Missed Exams

A 0% grade will be given for any missed exam

Academic Integrity

Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty. Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room. Exam cheating can also include exam impersonation. A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Students should acquaint themselves with the University's policy on plagiarism, cheating, exam

impersonation and duplicate submission (see Section 7, p. 29 in the University of Manitoba Undergraduate Calendar 11/12).

Use of Third Party Detection and Submission Tools

Electronic detection tools may be used to screen assignments in cases of suspected plagiarism.

Course Content

Photosynthesis and respiration

- _ The capture of light energy and its conversion into organic compounds
- _ Photorespiration and photosynthetic processes
- _ Photosynthetic efficiency: C 3 and C 4 plants
- _ Function of respiration
- _ Factors affecting respiration

Water relations

- _ Properties of water
- _ Water, osmotic and pressure potentials
- _ Soil-plant-air continuum
- _ Transpiration

Mineral nutrition

- _ Essential nutrients for plant growth
- _ Ion up-take
- _ Soil, Roots and Microbes

Solute transport and assimilate partitioning

- _ Movements of nutrients and assimilate through plants
- _ membrane transport processes
- _ Source-sink relationships

Development and plant hormones

_ Auxins

_ Gibberellins

_ Cytokinins

_ Ethylene

_ Abscisic acid