

A Course Guide To

Life Strategies of Plants

BOT*2100

Drs. U. Posluszny and I. Tetlow

Department of Molecular and Cellular
Biology

Fall 2008

Instructors

Dr. Usher Posluszny received his Ph.D. from McGill University specializing in the area of developmental plant morphology. He continued his research on the structure, development and evolution of aquatic plants during his postdoctoral study at Harvard University and as a Life Science Fellow at the Hebrew University in Jerusalem, Israel. Elected a Fellow of the Linnean Society of London in 1976 he began his appointment at the University of Guelph in 1977 and is currently a professor in the Department of Botany. Dr. Posluszny continues to work with freshwater and marine plants as well as members of the grape family the Vitaceae. Over the past five years he has developed and taught a number of ethnobotanical courses including Plants and Human Use (BOT*1200), Plants and Biology and People (BOT*2000).

Dr. Posluszny can be contacted by e-mail at uposlusz@uoguelph.ca or at extension 52745. His office is in the New Science Complex, Room 4447.

Dr. Ian Tetlow was awarded a B.Sc. (Hons) in Plant Science from the Faculty of Agriculture at the University of Newcastle-upon-Tyne, U.K. in 1986. His Ph.D. project, undertaken at University College of North Wales (Bangor), U.K., focused on the physiological responses of plants to attack by biotrophic fungi with an emphasis on the effects of pathogens on plant carbon metabolism. Following his Ph.D. Dr. Tetlow began post-doctoral work at the University of Manchester, U.K. studying the regulation of carbon metabolism in non-photosynthetic plastids. Following post-doctoral studies Dr. Tetlow continued to work in the area of non-photosynthetic carbon metabolism and was awarded a Leverhulme Special Research Fellowship, followed by an Industrial Fellowship, both of which were held at the University of Manchester. In 2002 Dr. Tetlow moved to the University of Guelph and is currently an Assistant Professor in MCB. Current research interests involve understanding the role of protein-protein interactions and protein phosphorylation in regulating starch metabolism, and the regulation of vitamin E biosynthesis in plastids. Dr. Tetlow also teaches Metabolism in the Whole Life of Plants (BOT*4380).

Dr. Tetlow can be contacted by email at itetlow@uoguelph.ca or at extension 52735. His office is in the New Science Complex, Room 4471 (laboratory 4409).

Your teaching assistants in the laboratories will be **Denise McClellan**, **Christine Holley** and **Chris Trobacher**. They are responsible for dealing with your questions and making sure that you understand the procedures. In addition, they will be able to give you help in getting all the exercises to work. They will grade the LAB REPORTS that are handed in at the end of laboratories (see Grades). Denise McClellan, who can be reached at dmcclell@uoguelph.ca or at extension 54818, is also responsible for running the teaching laboratory, and for setting up, growing and caring for the plant material.

Texts

The **required** text for the course is

Plant Biology, 2nd Edition

By Linda E. Graham, James M. Graham and Lee W. Wilcox
Published by Prentice Hall, ♥ Pearson Education, 2006

The **required laboratory manual** is

BOT*2100
Life Strategies of Plants

D.J. McClellan and W.E. Rauser
Department of Botany
College of Biological Science
University of Guelph
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The manual and lab report sheets are available for sale in SCIE Room 4111 for \$7.00 beginning Sept. 4 for 1 week. You are responsible for bringing this manual to every laboratory.

Where and When

Lectures

Lectures MACK Room 115

Lectures are on

Tuesdays at 10:00 - 11:20 AM

Thursdays at 10:00 - 11:20 AM

The first lecture is on Thursday, Sept. 4 and lectures conclude Tuesday, Nov. 25. You are welcome to ask any questions during lectures, the laboratories or at any other times.

Laboratories

Laboratories will take place in Room 3304 Science Building. Laboratories are scheduled for

Wednesday 02:30 - 05:20 PM

Thursday 02:30 - 05:20 PM

Laboratories start on Wednesday Sept. 10 and Thursday Sept. 11.

Make sure that you read the pertinent lab exercises **ahead** of time. Consider the questions posed in each exercise; they can help you in completing the LAB REPORTS. Remember that you will be examined on laboratory-based material in the mid-term and final examinations. If you miss a laboratory due to illness please notify us immediately or bring documentation soon thereafter.

Grades

Your grade for the course will be determined from the total results of one midterm examination, laboratory work including an independent project and a final examination.

The **MIDTERM EXAMINATION** will be held at 10:00 AM on Tuesday Oct.14. It will contribute **30%** towards your final grade. Since the midterm examination occurs during a lecture period no alternative time will be scheduled. If you miss the midterm examination due to illness please notify us immediately or bring documentation soon thereafter.

The **FINAL EXAMINATION** will be Monday Dec. 8 at 8:30 AM – 10:30 AM. This examination will contribute **35%** towards your final grade. The final examination will cover primarily materials not covered in the midterm examination but will include related topics dealt with in the labs.

The examinations will cover the lecture AND laboratory materials. The examinations will consist of an array of multiple choice questions, some questions that require concise written answers, and analysis of visual materials. The answers to the midterm examination will be posted in the laboratory. Portions of the midterm examination will be returned to you. Any problems with examinations or questions arising from them must be resolved immediately.

LABORATORY WORK contributes **35%** towards your final grade. The grades come from: a) LAB REPORTS that are to be completed before departure from scheduled laboratory exercises (**20%**) and b) a Research Project (**15%**).

- a) There are **7 scheduled laboratories** that each require a lab report to be handed in before you leave the lab. Lab 1 is worth 2% of your final grade and Labs 2 – 7 are each worth 3% for a total of 20% of your final grade. The laboratory exercises are designed for a pair of students to work together. Preparing the LAB REPORT is done **individually** on the specific plant material selected. There is a schedule of Labs 1 - 7 in this course outline.
- b) The research project is worth 15% of your final grade. Later in the semester we will introduce you to the project, have you form a group of 3 students, assign each group a specific project, and introduce you to writing a scientific lab report. You will complete the project in your group during 1-2 regular lab times and then **write your report individually**.

Note: The project is due no later than **Nov. 25 5:00 p.m.** (last class day). Late projects will not be accepted unless there is valid documentation.

You will require a minimum of 6 hours of **independent study** a week (reading, checking your notes, preparing for the lab) to really get the most out of this course.

You will be asked to complete a **COURSE/INSTRUCTION AND TEACHING ASSISTANT EVALUATIONS** using **Blackboard**. The evaluation surveys and comments will be given to the instructors after final grades have been submitted.

Lectures

Dr. Ian Tetlow

1	Sept. 4	Introduction to the course; Evolution of Plants
2	Sept. 9	Evolution of Plants continued; Life Cycles (seedless plants)

Graham et al. 2nd Ed. pages

376 - 399 (Chapter 21), 346 - 348
376 - 399, 400 - 417

Dr. Usher Posluszny

3	Sept. 11	Classification, Reproductive strategies	418 - 429, 226 - 232
4	Sept. 16	Angiosperm flowers, Flowering genes, Pollination, Embryogenesis - fruits	418 - 426, 427 - 437
5	Sept. 18	Seeds - Germination & early growth	436 - 437
6	Sept. 23	Meristems	134 -149, 177-179
7	Sept. 25	Eukaryotic cell - cell types	58 - 79, 139 -144, 150 -169
8	Sept. 30	Tissue types	139 - 148
9	Oct. 2	Organ types - roots, stems - structure and function	170 - 189, 150 - 156
10	Oct. 7	Stems – secondary growth	157 - 168
11	Oct. 9	Leaves - structure and function	190 - 209
	Oct. 14	Tuesday (in class)	

MIDTERM EXAMINATION

Dr. Ian Tetlow

12	Oct. 16	Photosynthesis - evolution	81 - 86
13	Oct. 21	Photosynthesis - mechanism	86 - 93
14	Oct. 23	Photosynthesis – C acquisition, C3, C4, CAM	94 - 96
15	Oct. 28	Respiration	81 - 82, 96 - 102
16	Oct. 30	Inorganic nutrients in soils - N symbiosis	181 - 185, 330, 477 - 479
17	Nov. 4	Mycorrhizae	186 - 187, 505, 517, 535
18	Nov. 6	Water – potential and uptake	170 - 189
19	Nov. 11	Water loss	190 - 209
20	Nov. 13	Moving water and sugars around the plant	150 - 169
21	Nov. 18	Moving water and sugars around the plant	150 - 169
22	Nov. 20	Communication – hormones, tropisms	213 - 218, 222
23	Nov. 25	Review	

Laboratories

Week	Date	Lab #	Lab schedule
1	Sept. 4		No lab scheduled
2	Sept. 10, 11	1	Evolution of plants – life cycles Flowering Plants
3	Sept. 17, 18	2	From seeds to seedlings
4	Sept. 24, 25	3	From seeds to seedlings Continued Vegetative Parts of Young Plants
5	Oct. 1, 2	4	Plants Grow with Meristems - knowing different cell types
6	Oct. 8, 9	5	What's Inside Roots and Stems
7	Oct. 15, 16	6	What's Inside Leaves
8	Oct. 22, 23		Introduction to the project, sign up for a group of 3, assign projects to groups, how to write a scientific lab report
9	Oct. 29, 30		Projects
10	Nov. 5, 6		Projects
11	Nov. 12, 13		Projects
12	Nov. 19, 20	7	Seedling growth – water conducting tissues Seedling growth – gravity and light Symbioses
13	Nov. 26, 27		No lab scheduled Projects due Nov. 25 5:00 p.m.

