



DEPARTMENT OF BIOLOGICAL SCIENCES
COURSE OUTLINE

1. **Course:** PLANT BIOLOGY 421 – PLANT ANATOMY

Lecture Sections: L01 MWF 10:00-10:50 EEEL 345 FALL 2016

LABS: R 1200 hr BI 126
 R 1500 hr BI 126

Course Coordinator
/Instructor: Dr. E.C. Yeung BI 391 220-7186 yeung@ucalgary.ca

Desire 2 Learn (D2L) course name: TBA

Biological Sciences Department BI 186; (403) 220-3140; biosci@ucalgary.ca

2. **Prerequisites:** Biology 371 or 233 or any two of Biology 231, 241 and 243 and completion of at least 9.5 full-course equivalents. See section 3.5.C in the Faculty of Science section of the online Calendar (<http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html>)

3. **Grading:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

| | | | |
|---------------------|----------------------------|-----|--------------------------|
| First Written Test | (Lecture topics 1-5) | 10% | Thursday, Oct. 13 |
| First Lab Test | (Labs 1-4) | 5% | Thursday, Oct. 13 |
| Second Written Test | (Lecture topics 6-13) | 15% | Thursday, Nov. 17 |
| Second Lab Test | (Labs 1-6) | 25% | Thursday, Nov. 17 |
| Assignment | Due – December 1 | 10% | |
| Final Lab Exam | (all Lab materials) | 35% | |

The final Lab exam will be scheduled by the Registrar's office

Grading scale: 90% A+, 86% A, 82% A-, 78 B+, 74% B, 70% B-, 66% C+, 62% C, 58% C-, 54% D+, 50% D, <50% F.

A mark of $\geq 50\%$ is required on the laboratory portion of this course (all lab components except the final lab exam, i.e. all lab written tests and the assignment) to pass the course as a whole.

Each piece of work (assignment, written/lab tests and final examination) submitted by the student will be assigned a percentage score. The student's average percentage score for the various components listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade, (bearing in mind that an F grade will result if the student does not pass the laboratory component).

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.3](#) of the University Calendar
5. **Scheduled out-of-class activities:** Dates and times of approved class activities held outside of class hours. NIL
REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.
6. **Course Materials:** [An Introduction to Plant Structure and Development](#), C.B. Beck
[Teaching Plant Anatomy](#), R.L. Peterson et al. NRC Press

Please see the following website for additional teaching material:

www.botany.org and check out the "Botanical Links" – Canadian Botanical Association Teaching Section Resources Page.

7. **Examination Policy:** No written or electronic aids are allowed for examinations in this course. Students should also read the Calendar, [Section G](#), on Examinations.
8. **Writing across the curriculum statement:** See also [Section E.2](#) of the University Calendar.

9. **Human studies statement:** If you consent, your course work may be used for research purposes once the course is over. Your responses will remain anonymous and confidential. Grouped data (no individual responses) may be used in academic presentations and publications. Participation in such research is voluntary and will not influence grades in this course. Students' signed consent forms will be withheld from instructors until after final grades are submitted. More information will be provided at the time student participation is requested. See also [Section E.5](#) of the University Calendar.

ETHICS IN THE BIOLOGICAL SCIENCES

Studies in the Biological Sciences involve the use of living and dead organisms. Students taking laboratory- and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

10. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- (a) **Academic Misconduct:** (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties.
- (b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- (c) **Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students *with Disabilities available at http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf*.
- Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Biological Sciences, Dr. H. Addy by email addy@ucalgary.ca or phone 403 220-3140.
- (d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also <http://www.ucalgary.ca/secretariat/privacy>.
- (f) **Student Union Information:** VP Academic Phone: 403 220-3911 Email: suvpaca@ucalgary.ca
SU Faculty Rep. Phone: 403 220-3913 Email: science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca;
Student Ombuds Office: 403 220-6420 Email: ombuds@ucalgary.ca; <http://ucalgary.ca/provost/students/ombuds>
- (g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- (h) At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

| <u>Lecture Topics</u> | Dickison | Beck |
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| 1. Introduction. General construction of the plant body. Apical meristems. Primary meristems. | 1, 2 | 1,2,5,16 |
| 2. Plant Cell: Organelles and Inclusions | 1 | 3 |
| 3. Cell Wall | 1 | 4 |
| 4. Parenchyma and Transfer cells | 2, 7 | 2 |
| 5. Collenchyma and Sclerenchyma | 2, 12 | 2 |
| 6. Xylem – Cell Types and formation | 2, 5, 7 | 6 |
| 7. Xylem – Organization of the Primary Xylem | 2 | 6 |
| 8. Phloem – Cell Types and formation | 2, 7 | 6 |
| 9. Phloem – Organization of the Primary Phloem | 2 | 6 |
| 10. Vascular Cambium | 4 | 9,10 |
| 11. Secondary Xylem / Wood | 4, 8, 9, 12, 15 | 11 |
| 12. Secondary Phloem | 4 | 12 |
| 13. Periderm and Bark | 2, 4 | 13 |
| 14. Root – General Organization and primary tissues | 3 | 8,16 |
| 15. Root – Secondary Growth Pattern | 4 | 2,16 |
| 16. Root – Structural Variations | 4 | 14,16 |
| 17. Stem – General Organization and primary tissues | 3 | 2,8 |
| 18. Stem – Secondary Growth pattern | 4 | 2,9 |
| 19. Stem – Monocot Stems | 3, 4 | 14 |
| 20. Leaf – Epidermis | 3, 10 | 8 |
| 21. Leaf – Mesophyll and Vascular tissues | 3, 7 | 17 |
| 22. Leaf – Variations in structures | 8 | 17 |

Recommended Readings (in main library)

1. Cutler, D.F. 1978. Applied Plant Anatomy. Longman, London
2. Cutter, E.G. 1978. Plant Anatomy. Part 1, 2nd ed. Addison-Wesley, Ma.
3. Cutter, E.G. 1971. Plant Anatomy. Part 2. Addison-Wesley, Ma.
4. Esau, K. 1977. Anatomy of Seed Plants, 2nd ed. Wiley, New York.
5. Fahn, A. 1974. Plant Anatomy, all editions. Pergamon, New York.
6. O'Brien, T.P. and M.E. McCully. 1969. Plant Structure and Development. MacMillan, London.

Any plant anatomy books

Web information and image collections from various sources