Biology 1130-FAO
Course outline
2022F

THE BASICS

- Lecturer: Dr. David Law
- Office: OA 3004
- email: dlaw@lakeheadu.ca
- Office hour: No scheduled office hour; make an appointment by email to talk with me on Zoom. We can also talk before or after class.
- Phone: None; make an appointment by email to talk with me on Zoom.

Please use the lakeheadu.ca email address above to contact me, not the email within D2L. I will check my email daily Monday to Friday, and will try to respond to your questions as quickly as possible during those days.

Class info

All material is posted on MyInfo/D2L; check there for the latest course updates and information.

Biology 1130 is offered in-person.

Calendar description

Biology 1130 Plant Biology

An introduction to plant diversity stressing the evolution of plants. Comparative morphology of vegetative and reproductive structures will be emphasized. Topics will also include functional anatomy, photosynthesis and respiration.

- Credit Weight: 0.5
- Offering: 3-3; 0-0
- Notes: An additional fee (see Miscellaneous Fees) is required for this course.

- Course Classifications: Type C: Engineering, Mathematical and Natural Sciences

Instructor's note: under "Offering", (a) "3-3" means 3 hours of lectures plus 3 hours of labs a week; (b) "3-3; 0-0" means that the course is offered in the fall term only; winter term courses will have numbers after the semicolon.

LEARNING OUTCOMES

During this course, you will...

- demonstrate your understanding of the importance of plants in the ecosphere
- improve and expand your critical understanding of major concepts in plant biology, including
    - diversity and evolution
    - morphology and anatomy
    - development
    - reproduction
    - classification
    - biochemistry
    - ecology
- develop both hard and soft biological skills, such as
- working with your peers
- conceiving, writing and delivering written work by applying information obtained in lecture, from your textbook and from other scientific sources

By the end of this course, you will be comfortable...

- using common plant biology terms
- using library resources to find scientific literature on plant biology
- discussing the importance of plant conservation and the environment
- discussing experimental model organisms used in plant biology
- discussing cross-species themes related to the biology of all eukaryotes
- debating the pros and challenges of modern agriculture, organic agriculture and genetically modified crop plants

IN-PERSON LECTURES

All of my lectures will be delivered in-person.

The past two years of teaching remotely has taught me that we should all try to be patient and kind to others during lectures. I appreciate feedback letting me know what does and doesn't work. For example, last year a student told me my slides were blurry during our Zoom lectures... this was a consequence of me trying to improve their quality by broadcasting in 4K without considering everyone's sometimes limited internet bandwidth. If you're having a problem understanding me during in-person lectures this year, speak up right away so I can fix the issue.

Our classroom is COVID-safe and mask-friendly

I'm excited but slightly uneasy about returning to in-person learning this fall; perhaps you are too. Everyone is free to mask in class; I may do so as well. As the COVID situation evolves this fall, I may strongly encourage masking. There is also a chance that I may move classes to Zoom rather than in-person. For now, I hope we have a successful start to the fall term in-person.

Be courteous and participate in class

I ask a lot of questions during lectures. I welcome volunteers to answer. I also plan to call on students by name to answer some simple questions during class, so be prepared for that. This isn't to embarrass you but rather to make you more comfortable participating in group work and offering your opinion in front of others, both of which will be a major part of your university life and future career.

Do the review questions in the breakout groups

I will end each lecture with some relevant questions. We'll answer these in breakout groups of around 4 to 6 students each. One person per group will answer their question. I'm not expecting perfect answers but want you to think about the questions and answers. While **I do not mark your group's answers to the breakout question you are assigned in**

class, there's a good chance that similar questions will appear on the midterms and final exam, so participating in the breakout groups is excellent prep for doing well on the tests.

Attend lectures to receive participation marks

You have to be present during lectures to participate in the iClicker questions and receive participation marks.

LECTURE AND LAB SCHEDULE

Lectures:

- Tues. Sept. 7 to Thurs. Dec. 1, 2022
- Tuesdays and Thursdays, 1:00 PM - 2:20 PM
- Location: OA 2008

Following is a **preliminary** lecture schedule. Lectures are generally available for download from D2L on the evening prior to the lecture.

Note that the 2022F study break is M October 10 to F October 14.

The course also includes a final exam based on the lecture material, written during the normal fall exam period in December; date and time is TBA.

Required readings below are in **green**; optional readings are in **black**.

Week of	Topics	**Reading** (chapter/section...)		
		Exploring Biology	***Concepts of Biology***	***Biology 2e***
Sept. 5	Introduction to plant biology	--	• 14 intro • 1.1 • 1.2	• 1.1 • 1.2
	Cell theory; prokaryotes and eukaryotes; endosymbiosis	• 6 intro • 6.1	• 3.1 • 3.2 • 13.2	• 4.1 • 4.2
Sept. 12	Plant cell structure	• 6.2 • 6.3	• 3.3	• 4.3
	Plant cell types; plant tissues	• 25 intro • 25.1 • 6.3	--	• 30.1
Sept. 19	Mitosis	• 11	• 6.1 • 6.2	• 10.1 • 10.2 • 10.3
	Meiosis	• 12	• 7.1 • 7.2	• 11
Sept. 26	Photosynthesis	• 9	• 5	• 8
	Midterm #1: Thurs. Sept. 29			
Oct. 3	Cellular respiration	• 10	• 4.1 • 4.2 • 4.3	• 7
	Photosynthetic prokaryotes	• 19: Domain Bacteria: 1. Cyanobacteria	• 13.1: Prokaryotic diversity: Early life on Earth	• 22.1: Prokaryotes, the First Inhabitants of Earth
Oct. 10	**Fall study break (no classes)**			
Oct. 17	Green algae/"protists"	• 20.2	• 13.3: Protists: Characteristics; How protists obtain energy; Reproduction; Protist diversity; Beneficial protists	• 23.3: Groups of protists: Intro, Archeaeplastida
	Land plant evolution	• 21 intro	• 14 intro • 14.1: Plant adaptations to life on land	• 23 intro • 23.3 • 25.2

Oct. 24	Non-vascular plants: mosses	• 21.3	• 4.2: Bryophytes: liverworts, hornworts, mosses	• 25.3
	Seedless vascular plants: ferns	• 22 intro • 22.4	• 14.2: Vascular plants: seedless vascular plants	• 25.4
Oct. 31	Stems	• 25 intro • 25.1 • 25.3	--	• 30.2
	Midterm #2: Thurs. Nov. 3			
Nov. 7	Roots	• 25.1 • 25.2	--	• 30.3
	Leaves	• 25.4	--	• 30.4
Nov. 14	Seed plants: gymnosperms: the conifers	• 23 intro • 23.4	• 14.3: Seed plants: gymnosperms	• 26.1 • 26.2
	Seed plants: angiosperms	• 24 intro • 24.1	• 14.4: Seed plants: angiosperms	• 26.3 • 26.4
Nov. 21	Angiosperm sexual reproduction: flowers, fruits and seeds	• 24.2 • 24.3 • 24.4	• 14.4: Seed plants: angiosperms	• 26.4
	Asexual reproduction	--	--	• 32.3
Nov. 28	Catch-up day			
	Final exam review			

Labs: See your lab schedule and content at the BIOL-1130-FO1 lab D2L site.

LEARNING MATERIALS

Learning materials for this course include things you must buy and free internet resources.

You have 2 things to buy:

- The laboratory manual ***Exploring Biology in the Laboratory***, Murray P. Pendarvis and John L. Crowley (third edition, 2018), Morton Publishing, Englewood, CO, USA. You can buy either the paper version (ISBN 978-1-61731-755-2) from the Lakehead bookstore (CAD 143) or elsewhere (e.g., at Amazon), or the e-version (eISBN-13: 9781617317569) for USD ~80 from Redshelf or Google Play. Note that most of you will also use this lab manual next term in BIOL-1110: Animal biology and so you'll need to access it until the end of April 2022; I thus recommend buying rather than renting.

- The iClicker Student mobile app for your mobile device: ~CAD 22 for the fall term. Once you've installed it, link it to the course by searching for my name at the Lakehead University-Orillia campus and choosing BIOL-1130-FDG: Plant biology. This will get you ready to participate and receive marks for the in-class polling that will start in the first class on Wednesday, Sept. 8. See further info below for how this works under "Student participation".

We will use 2 OpenStax textbooks in the lecture portion of the course. These are both

online and free.

- Our main textbook is ***Concepts of Biology***. Senior contributing authors Samantha Fowler, Rebecca Roush and James Wise (2021). Digital ISBN-13: 978-1-947172-03-6.

- For plant-specific topics not covered in *CoB*, we'll occasionally use ***Biology 2e***. Senior contributing authors Mary Ann Clark, Matthew Douglas and Jung Choi (2021). Digital ISBN-13: 978-1-947172-52-4.

Extra textbook:

Mauseth: Botany: An Introduction to Plant Biology 7th edn

An extra textbook that is not required for the course but might be useful. This is the most recent version of the botany textbook I originally used in this course. Useful for its discussion of the same concepts covered in *Concepts of Biology* but uniquely from a plant perspective.

You have to first log into your LU email account to access this ebook. Click the link above to get started.

MARKING SCHEME

- Midterm exam 1: **15%**
- Midterm exam 2: **20%**
- Final exam (date TBA): **20%**
- Course participation: **5%**
- Labs (more details at the BIOL-1130-FO1 D2L site): **40%**

STUDENT PARTICIPATION

All course participation will be done using the **iClicker Student** (formerly known as iClicker Reef) app for your smartphone/tablet/computer/other device. Buy it in either the Android or iOS app store.

Bring either your device with the app on it to each class. You will use it to answer questions in class and receive participation marks.

To link your app to the course, search for the course under my name at Lakehead-Orillia: "BIOL-1130-FAO: Plant Biology". Then add it to your list of courses. The cost is around CAD 22 for a 6-mo subscription.

Previously, students have asked me to choose a free polling app (e.g., the basic version of Top Hat; Kahoot!; Zoom polling) rather than a paid version. I have researched many of them and found that iClicker Student best meets my and students' need for participation tracking, user friendliness and reliability.

Five percent of your final mark is allocated to participation. In each lecture, you will use the clicker to answer questions that are based on the course material using the iClicker during my lectures. The 5% participation mark will be equally weighted for

- attendance (2.5%), and
- correct answers (2.5%).

Therefore, to receive a high participation mark, you have to be both physically and mentally present in class!

You may miss 3 lectures without penalty to your participation mark. For example, if there are 15 classes where we vote with iClicker, you need to be present for 12 of these to receive full credit for attendance. Additional information on the technology will be given in the first class.

ACADEMIC DISHONESTY

Lakehead has a Student Code of Conduct – Academic Integrity. All students in this course should read the Code and become familiar with it.

To summarize the relevant parts of the Code, the penalty for plagiarism or cheating on any part of this or any other course is zero for the work where the student is caught. Serious or repeated plagiarism, including cheating on an examination or test, will result in a mark of zero for the course and may result in expulsion from Lakehead.

There are three particular places in this course where cheating might occur:

1. submitting written work that you did not research and write;
2. using written or electronic notes to confer with another person in a test or examination; or 3. voting electronically in place of another person using iClicker Reef.

Academic dishonesty for any of these areas will result in a mark of **zero** for the work concerned.

To ensure academic fairness for students who work hard, rest assured that the course instructors will take **every precaution** to ensure that potential cheaters are caught and subjected to the appropriate penalty.