

Course Outline Form: Winter 2026

General Information

Course Code: PBIO 4290

Course Title: Cannabis Production

Course Description:

This course covers the essential biology, biochemistry of cannabis (*Cannabis sativa*), as well as the science and technologies of propagation, cultivation, harvest, postharvest storage and processing of this plant. By taking this course, students will also learn how to cultivate other plants in controlled environments. This course also discusses the potential environmental impacts of cultivation, processing, and the related remediation technologies. In addition, it discusses the history of cultivation and uses of the plant, and current legislation of cannabis production and consumption in different cultures/countries. Students will learn through lecture (including guest lecture), hands-on laboratory practice, site visit, literature research and presentation, and group discussion.

Credit Weight: 0.5

Academic Department (or campus): School of Environmental Sciences

Campus: Guelph

Semester Offering: W26

Class Schedule and Location: LEC Tue, Thur, 02:30PM - 03:50PM; ROZH, 109 LEC.

Instructor Information

Instructor Name: Dr. Youbin Zheng

Instructor Email: yzheng@uoguelph.ca

Office hours: email to make an appointment.

Course Content

Specific Learning Outcomes:

At the end of this course, successful students will be able to:

1. understand the essential biology and biochemistry of *Cannabis sativa*;

2. understand the science behind propagation, cultivation, harvest, postharvest, and processing of cannabis plant and be able to select the right methods and technologies for the above under various situations;
3. produce other crops, such as vegetables, pharmaceutical and nutraceutical plants, in controlled environments;
4. understand cannabis-related regulations and to find credible information on socially responsible ways of producing/using cannabis;
5. demonstrate enhanced critical thinking skills through critiquing current scientific literature, evaluating other students' presentations and participating in lectures and in-class discussions;
6. demonstrate enhanced communication skills;
7. exhibit improved professional and ethical behavior towards diverse scientific ideas and academic opinions through presentations, group discussions and evaluating presentations by other students.

Lecture Content & Tentative Schedule (*subject to change*):

Week	Date	Topic
1	Jan 6	Introduction
	Jan 8	Overview of current cannabis production systems & practices: indoor, greenhouse and field.
2	Jan 13	Cannabis biology, biochemistry, genetics, evolution, breeding, history of cultivation, use and regulations in Canada and internationally.
	Jan 15	Cannabis biology, biochemistry, genetics, evolution, breeding, history of cultivation, use and regulations in Canada and internationally.
3	Jan 20	Soilless production systems
	Jan 22	Rootzone Oxygen: need, monitoring and management
4	Jan 27	Cannabis plant nutrition and fertilization/fertigation; Irrigation and Water Quality
	Jan 29	Growing media, Integrated Rootzone Management (IRM)
5	Feb 3	Radiation, lighting technologies and their applications in cannabis production.
	Feb 5	Radiation, lighting technologies and their applications in

		cannabis production.
6	Feb 10	CO ₂ in cannabis production; humidity, temperature and their control in cannabis production
	Feb 12	Midterm exam
7	Feb 24	Review Midterm exam Common pathogens in cannabis production and control measures
	Feb 26	Common insect pests in cannabis production and control measures Guest lectures by Jason Lemay
8	Mar 3	Guest lecture by Chad Rigby, Grodan.
	Mar 5	Cannabis plant propagation, cultivation, harvest, postharvest and processing (e.g., THC & CBD extractions)
9	Mar 10	Guest lecture extraction
	Mar 12	Chemical and biological analyses, report interpretation, quality assurance and quality control.
10	Mar 17	Potential environmental impacts of cannabis production and processing, e.g., air quality (such as odour), water, nutrient and other waste discharge, energy consumption and light pollution, and the related remediation technologies.
	Mar 19	Good Manufacturing Practice (GMP) in medicinal/pharmaceutical plant production and Health Canada Regulations for cannabis production.
11	Mar 24	Lab
	Mar 26	Lab and report writing
12	Mar 31	Student literature research presentation
	Apr 2	Wrap up and site visit

Good Manufacturing Practice (GMP) in medicinal/pharmaceutical plant production and Health Canada Regulations for cannabis production.

Course Assignments and Tests:

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Discussion & evaluation of other		10	1, 2, 3, 4, 5, 6, 7

students' presentations			
Lab/report	Mar 26 (11:30PM)	10	2, 3, 5, 6, 7
Midterm exam	Feb 12 (14:30-15:50)	35	1, 2, 3, 5
Final Exam	April 10 (8:30-10:30)	45	1, 2, 3, 5

Additional Notes (if required):

n/a

Course Resources

Required Texts:

Handbook of Cannabis Production in Controlled Environments (ed. Youbin Zheng, available in the UofG library; you can also purchase at Amazon with price ranging from \$95-350). Some other recommended reading material sources will be posted.

Standard Statements for Undergraduate Courses

Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor. The Academic Misconduct Policy (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academicmisconduct/>) is outlined in the Undergraduate Calendar.

Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway. Accommodations are available for both permanent and temporary disabilities. It should be

noted that common illnesses such as a cold or the flu do not constitute a disability. Use of the SAS Exam Centre requires students to make a booking at least 10 days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time. For students at the Guelph campus, information can be found on the SAS website. ([https:// www.uoguelph.ca/sas/](https://www.uoguelph.ca/sas/)).

Accommodation of Religious Obligations

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements. See the Academic calendar for information on regulations and procedures for Academic Accommodations of Religious Obligations (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-accommodation-religious-obligations/>).

Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all undergraduate students except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in the Undergraduate Calendar - Dropping Courses (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulationsprocedures/dropping-courses/>).

Email Communication

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

Health and Wellbeing

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness (<https://wellness.uoguelph.ca/>). If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator (<https://wellness.uoguelph.ca/navigators/>) who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources (<https://wellness.uoguelph.ca/shine-this-year/>). The Student Wellness team are here to help and welcome the opportunity to connect with you.

Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

Recording of Materials

Presentations that are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The Academic Calendars (<http://www.uoguelph.ca/registrar/calendars/?index>) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration. (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulationsprocedures/academic-consideration-appeals-petitions/>)