

PBIO*4290 - Cannabis Production

Winter 2024 Course Outline Section: 01 Credits: 0.50

Land Acknowledgement: Guelph

The University of Guelph resides on the ancestral lands of the Attawandaron people and the treaty lands and territory of the Mississaugas of the Credit. We recognize the significance of the Dish with One Spoon Covenant to this land and offer respect to our Anishinaabe, Haudenosaunee and Métis neighbours. Today, this gathering place is home to many First Nations, Inuit, and Métis peoples and acknowledging them reminds us of our important connection to this land where we work and learn.

Calendar Description

This course covers the essential biology and biochemistry of cannabis (Cannabis sativa), as well as the science and technologies of propagation, cultivation, harvest and postharvest the plant, and the potential environmental impacts and related remediation technologies. It will also discuss the history of cultivation and uses of cannabis, and current legislation of cannabis production and consumption in different cultures/countries. Students will learn through lectures (including guest lectures), hands-on laboratory practices, site visits, literature research, presentations, and group discussions.

Prerequisite(s): 14.50 credits including CHEM*1040, (ENVS*2040 or ENVS*3210), (PBI0*3110 or PBI0*3120) Department(s): School of Environmental Science

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. It also discusses the potential environmental impacts of cultivation and processing, and the related remediation technologies. This course also 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 lectures (including guest lectures), hands-on laboratory practices, and site visits, literature research and presentations, and group discussions.

Prerequisite(s): 14.50 credits including CHEM*1040, (ENVS*2040 or ENVS*3210), (PBIO*3110 or PBIO*3120). Students may allowed to enrol even if they do not have the exact prerequisites by sending their unofficial transcripts to the instructor, and the instructor will provide permission based on the students' academic background preparations.

Department(s): School of Environmental Science

Lecture Schedule

TuTh 2:30pm-3:50pm in MCKN*304 (1/8 to 4/23)

Instructor Information

Youbin Zheng Email: yzheng@uoguelph.ca

Textbooks

itle	Author	ISBN
andbook of Cannabis Production in ` ontrolled Environments	Youbin Zheng (ed)	9780367712570
it a o	le ndbook of Cannabis Production in ntrolled Environments	le Author ndbook of Cannabis Production in Youbin Zheng (ed) ntrolled Environments



Course Learning Outcomes

1. 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, including 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.

Course Level Learning Outcomes

Faculty able to add a new set of Course Learning Outcomes if they don't want to use the prepopulated ones from the content block above (from Curriculum Inventory Management [CIM] system).

OR - fully editable content block - Instructors may add additional content if necessary. This content block can be removed by clicking the 'eye' icon.

Open Text Field

open text box for faculty to edit (can change title and content)

Schedule of Topics and Assignments

Day:	Date:	Торіс	Activities	Due:
Tue	1/9	Introduction, site-visit.		
Thu	1/11	Overview of current cannabis production systems & practices: indoor, greenhouse and field.		
Tue	1/16	Lab and greenhouse tour		
Thu	1/18	Cannabis biology, biochemistry, genetics, evolution, breeding, history of cultivation, use and regulations in Canada and internationally.		
Tue	1/23	Cannabis biology, biochemistry, genetics, evolution, breeding, history of cultivation, use and regulations in Canada and internationally.		
Thu	1/25	Soilless production systems		
Tue	1/30	Rootzone Oxygen: need, monitoring and management		
Thu	2/1	Good Manufacturing Practice (GMP) in medicinal/pharmaceutical plant production and Health Canada Regulations for cannabis production.		
Tue	2/6	Cannabis plant nutrition and fertilization/ fertigation; Irrigation and Water Quality		
Thu	2/8	Growing media, Integrated Rootzone Management (IRM)		
Tue	2/13	Radiation, lighting technologies and their applications in cannabis production		
Thu	2/15	Midterm exam		
Tue	2/20	Winter Break		
Thu	2/22	Winter Break		



Tue	2/27	Review Midterm exam Radiation, lighting technologies and their applications in cannabis production.
Thu	2/29	CO2 in cannabis production; humidity, temperature and their control in cannabis production
Tue	3/5	Guest lecture by Chad Rigby, Grodan.
Thu	3/7	Common pathogens in cannabis production and control measures
Tue	3/12	Common insect pests in cannabis production and control measures Guest lectures by Jason Lemay
Thu	3/14	Cannabis plant propagation, cultivation, harvest, postharvest and processing (e.g., THC & CBD extractions)
Tue	3/19	Guest lecture extraction
Thu	3/21	Chemical and biological analyses, report interpretation, quality assurance and quality control.
Tue	3/26	Potential environmental impacts of cannabis production and processing, e.g., air quality (such as odours), water, nutrient and other waste discharge, energy consumption and light pollution, and the related remediation technologies.
Thu	3/28	Student literature research presentations
Tue	4/2	Student literature research presentations
Thu	4/4	Wrap up
Tue	4/9	Free time for final exam preparation.

Teaching and Learning Activities

Weekly Activities

<Optional content block - title and content block fully editable>

Instructors may add additional content if necessary. This content block can be removed by clicking the 'eye' icon.

Assessment Breakdown

{NOTE: instructor can add another row by hitting "TAB" button when they are at the end of the row}

Description	Weighting (%)	Due Date
Discussion & evaluation of other students' presentations1	10%	Before the end of the class
Midterm exam	45%	Feb 15
Final exam	45%	April 15

Assessment Details

Final Exam

Date: Apr 15



JNIVERSITY

Location: TBA Please see Web Advisor closer to the date of scheduled final for location.

To understand rules and regulations regarding Examinations students are encouraged to read Student's Responsibilities (https:// calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/examinations/)

If the student is unable to meet the final exam requirements due to medical, psychological or compassionate circumstances they are encouraged to review Student's Responsibilities in the Academic Consideration, Appeals and Petitions (https://calendar.uoguelph.ca/undergraduate-calendar/ undergraduate-degree-regulations-procedures/academic-consideration-appeals-petitions/) section of the Academic Calendar.

Last Day to Drop Course

The final day to drop Winter 2024 courses without academic penalty is the last day of classes: April 08

After this date, a mark will be recorded, whether course work is completed or not (a zero is assigned for missed tests/assignments). This mark will show on the student's transcript and will be calculated into their average.

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/academic-misconduct/) 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/)

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-regulations-procedures/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-regulations-procedures/academic-consideration-appeals-petitions/)