



PBIO*4290 Cannabis Production

Winter 2022

Section(s): C01

School of Environmental Sciences

Credit Weight: 0.50

Version 1.00 - December 20, 2021

1 Course Details

1.1 Calendar Description

This course covers the essential biology and biochemistry of cannabis (*Cannabis sativa*), as well as the science and technologies of propagation, cultural management and production, postharvest storage and processing of the plant, and the potential environmental impacts and related remediation technologies. It will also discuss 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, site visits, literature research and presentations, and group discussions.

Pre-Requisites: 14.50 credits including CHEM*1040, ENVS*3300,
(ENVS*2040 or ENVS*3210)

1.2 Course Description

This course covers the essential biology, biochemistry of cannabis (*Cannabis sativa*), as well as the science and technologies of propagation, cultural management and production, postharvest storage and processing of the plant, and the potential environmental impacts and related remediation technologies. It 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 (not this year), site visits (not this year), literature research and presentations, and group discussions.

1.3 Timetable

Timetable is subject to change. Please see WebAdvisor for the latest information.

1.4 Final Exam

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Class Schedule and Location

LEC Tue, Thur, 02:30PM - 03:50AM, Synchronous remote for the first two weeks, then face-to-face in MCKN, Room 308

3 Learning Resources

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

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, production, 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 (both oral and written) through written assignment and an in-class presentations (on a student-selected topic);

7. exhibit improved professional and ethical behavior towards diverse scientific ideas and academic opinions through presentations, group discussions and evaluating presentations by other students.

5 Teaching and Learning Activities

5.1 Lecture

Topics:

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

Week	Date	Topic
1	Jan 11	Introduction
	Jan 13	Overview of current cannabis production practices: indoor, greenhouse and field.
2	Jan 18	Cannabis biology, biochemistry, genetics, breeding, history of cultivation, use and regulation in Canada and internationally.
	Jan 20	Cannabis biology, biochemistry, genetics, breeding, history of cultivation, use and regulation in Canada and internationally. Decide who is presenting research and present on what topic.
3	Jan 25	Cannabis biology, biochemistry, genetics, breeding, history of cultivation, use and regulation in Canada and internationally.

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	Jan 27	Soiless production systems
4	Feb 1	Rootzone Oxygen: need, monitoring and m
	Feb 3	Cannabis plant nutrition and fertilization/
5	Feb 8	Irrigation and Water Quality
	Feb 10	Growing media, Integrated Rootzone Man
6	Feb 22	Radiation, lighting technologies and their cannabis production.
	Feb 24	Midterm exam
7	Mar 1	Review Midterm exam Radiation, lighting technologies and their cannabis production.
	Mar 3	CO ₂ in cannabis production
8	Mar 8	Humidity, Temperature and their control i production
	Mar 10	Common insect pests in cannabis produc measures Guest lecture

9	Mar 15	Common pathogens in cannabis products and control measures. Deadline for literature review submission at the end of today.
	Mar 17	Cannabis plant propagation, production, harvest, and postharvest and processing (e.g., THC & CBD extraction).
10	Mar 22	Guest lecture
	Mar 24	<p>Good Manufacturing Practice (GMP) in medicinal/pharmaceutical plant production.</p> <p>Canada Regulations for cannabis production.</p> <p>Chemical and biological analyses, report writing, and quality assurance and quality control.</p> <p>Potential environmental impacts of cannabis production and processing, e.g., air quality (such as odors), nutrient and other waste discharge, energy use, and light pollution, and the related remediation technologies.</p>
11	Mar 29	Student literature research presentations
	Mar 31	Student literature research presentations
12	Apr 5	Student literature research presentations
	Apr 7	Student literature research presentations

6 Assessments

6.1 Marking Schemes & Distributions

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Discussion & evaluation of other students' presentations		10	1, 2, 3, 4, 5, 6, 7
Literature review on chosen topic	Midnight March 15	15	4, 5, 6, 7
Presentation		15	4, 5, 6, 7
Midterm exam	Feb 24	30	1, 2, 3, 5
Final Exam	TBD	30	1, 2, 3, 5

7 University Statements

7.1 Email Communication

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

7.2 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. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

7.3 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 students (undergraduate, graduate and diploma) 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 their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

7.4 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.

7.5 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 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or

changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website
<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website
<https://www.ridgetownc.com/services/accessibilityservices.cfm>

7.6 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 encourages academic integrity. 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.

Undergraduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

7.7 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.

7.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
<https://www.uoguelph.ca/academics/calendars>

7.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

7.10 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).

7.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campusess/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campusess/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
