

Syllabus  
**Medical Cannabis**  
**Pharm 200**  
**Spring 2021**  
offered remote during pandemic

**Tuesdays and Thursdays 4:25pm – 5:40pm**

**Directors:**

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**Course Description**

Pharmacology 200, *Medical Cannabis* will be offered by the Department of Pharmacology in the Spring Semester 2021 as an introductory level Pharmacology course for undergraduate and graduate students. This course will use *Cannabis* as a springboard to introduce fundamental concepts in Pharmacology (the science of drug actions). The *Cannabis* plant has an interesting history, and recent policy changes have led to an explosion in *Cannabis* science. Presentations intersperse historical, political, and social background information with more advanced scientific concepts in pharmacology and medicine.

The course will be divided into four areas of content: 1) plant biology, 2) biological effects on humans, 3) Cannabis analytic chemistry, and 4) clinical research. We will also discuss current information about the Vermont experience with medical marijuana. This course will provide students with a foundation of up-to-date scientific knowledge in a complex and evolving area of medicine, while introducing key concepts in human physiology and pharmacology.

**Course learning goals**

This course is intended to be a unique experience for students to develop a broad understanding of *Cannabis* and its medicinal use, with more advanced concepts relevant to pharmacology and medicine in the context of the following specific objectives:

1. Discover the important milestones in the human use of *Cannabis*
2. Gain an understanding of how plants are classified and the implications this has on writing *Cannabis* policies

3. Understand current issues in *Cannabis* business, law, and policy
4. Explore the chemical compounds found within Cannabis and different methods used to extract its specific psychoactive other neural effects
5. Examine the spectrum of medicines and toxins provided by natural products
6. Detail the basic pharmacological properties of cannabinoids including their absorption and metabolism as well as their mechanisms of action
7. Discuss the biology of addiction and compare *Cannabis* with other drugs of abuse
8. Develop knowledge of the physiology and pathology underlying neurological and inflammatory disorders including chronic pain, epilepsy, multiple sclerosis, and migraine
9. Catalog the evidence-based studies that detail the benefits of cannabis in the treatment of several neurological and inflammatory disorders
10. Utilize a balanced academic approach to dispel myths surrounding the benefits and toxicities associated with *Cannabis* use

## Readings

### Required:

There is no required textbook, but readings will be regularly distributed to students.

### Recommended Texts and Readings:

Ahmad, S., K.P. Hill. 2021. *Medical Marijuana: A clinical handbook*. NY: Wolters Kluwer.

CDC. 2018. Marijuana and Public Health. Available online  
<https://www.cdc.gov/marijuana/index.htm>

Hanson, Bryan Abbot. 2005. *Understanding Medicinal Plants: Their chemistry and therapeutic action*. MI: Haworth Herbal Press. Print.

Holland, Julie, Ed. 2010. *The pot book: A complete guide to Cannabis*. ME: Park Street Press.

Koehn FE, Carter GT. 2005. The evolving role of natural products in drug discovery. *Nature Reviews Drug Discovery*. 4:206-20.

National Academies of Science. 2017. *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. Washington D.C.: National Academies Press.

Pertwee, Roger, Ed. 2014. *Handbook of Cannabis*. Oxford University Press.

## Performance Goals

1. Participation: students will be expected to view presentations, participate in discussions, and complete quizzes, assignments, and exams.
2. Written Assignments: All students will be required to submit written assignments that will require outside research and scientific writing. Students taking the course for graduate credit will have expanded assignments as described below.

- Exam format: Exams will consist of primarily multiple choice questions with the possibility of additional formats (i.e. True/False, Matching, short essay).

### Grading

We will use the following tentative grading scheme:

Exam 1	20%
Exam 2	20%
Exam 3	20%
Final Exam	20%
Assignments	15%
Participation	5%

**Class Discussion Board:** All students will be required to participate on the class discussion board. Undergraduate students will be required to read the discussion, post replies, and understand the material discussed. Graduate students will be required to post comments to each discussion prompt.

**Written Assignments:** All students will be required to submit 2 written assignments related to the course materials. Papers should be 2 pages in length, 12-point font, double-spaced. Please use MLA format to cite references. MLA stands for Modern Language Association. Perdue's library gives a [great explanation](#). "MLA format follows the author-page method of in-text citation. This means that the author's last name and the page number(s) from which the quotation or paraphrase is taken must appear in the text, and a complete reference should appear on your Works Cited page." More information on MLA style citations can be found [here](#) at UVM's Howe Library site. The assignments will be assigned according to student level as described below.

#### Undergraduate

Students will use the lecture material and at least one outside source to review and discuss course topics. Students will be asked for form evidence-based opinions on topics related to medical uses.

#### Graduate Student Credit

Students taking the course for graduate credit will be required to focus on primary literature and to present 4 scientific papers that integrate class area topics into an in-depth literature review. Students will be able to choose from several area topics presented prior to the due date.

**Modality:** PHRM 200 for Spring 2021 semester is a fully remote class. As part of your enrollment in the course, we will provide you login information to our online learning management system, Blackboard. Blackboard will house all of the curriculum materials, presentations, readings and resources for the Program. Blackboard will also be used for communication and networking, including the expected comments and responses required as part of assignments. Additionally, as part of your learning experience we may have live classes in our meeting space, Microsoft Teams. We have provided

information about [joining Microsoft Teams as a guest](#). Please try using Microsoft Teams before the first live seminar.

**Live Seminars:** There will be live seminars; these seminars will be used to present material, discuss key concepts related to the modules, to ask questions of faculty, and to share peer-to-peer knowledge on the topic. You will be notified which classes will be live at the beginning of the week. The first **live seminar will meet Tuesday February 2, 2021 in Teams at 4:30 PM (please note all times are EST)**. Live participation in the seminar is not required; but encouraged. Additionally, if you cannot participate in the live seminar, you will be expected to watch the recorded session at a different time.

**Recording Class sessions:** Our class sessions may be audio-visually recorded for students in the class to refer back to, and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the chat feature, which allows students to type questions and comments live.

**Research and Citation Help:** For help selecting research topics, finding information, citing sources, and more, ask a librarian. The UVM Libraries are eager to help. You may ask questions by phone, e-mail, chat, or text, or make an appointment for an individual consultation with a librarian.

Howe Library: <https://library.uvm.edu/askhowe>

Dana Medical Library: <https://dana.uvm.edu/help/ask>

Silver Special Collections Library: <https://specialcollections.uvm.edu/help/ask>

**COVID 19 Policy:** The University of Vermont reserves the right to make changes in the course offerings, mode of delivery, degree requirements, charges, regulations, and procedures contained herein as educational, financial, and health, safety, and welfare considerations require, or as necessary to be compliant with governmental, accreditation, or public health directives.

The Green and Gold Promise clearly articulates the expectations that UVM has for students, faculty, and staff to remain compliant with all COVID-19 recommendations from the federal CDC, the State of Vermont, and the City of Burlington.

The Code of Student Conduct outlines policies related to violations of the Green and Gold Promise. Sanctions for violations include fines, educational sanctions, parent notification, probation, and suspension.

**Intellectual Property and Academic honesty:** You are expected to maintain a high standard of academic honesty. Be particularly careful to avoid plagiarism when working on written assignments. Students are prohibited from publicly sharing or selling academic materials that they did not author (for example: class syllabus, outlines or class presentations authored by the professor, practice questions, text from the textbook or other copyrighted class materials, etc.); and students are

prohibited from sharing assessments (for example homework or a take-home examination). Violations will be handled under UVM's Intellectual Property policy and Code of Academic Integrity. The policy addresses plagiarism, fabrication, collusion, and cheating.

<https://www.uvm.edu/policies/student/acadintegrity.pdf>

**Religious holidays:** Students have the right to practice the religion of their choice. If you need to miss class to observe a religious holiday, please submit the dates of your absence to us in writing by the end of the second full week of classes. You will be permitted to make up work within a mutually agreed-upon time. <https://www.uvm.edu/registrar/religious-holidays>

**Student Learning Accomidations:** In keeping with University policy, any student with a documented disability interested in utilizing ADA accommodations should contact Student Accessibility Services (SAS), the office of Disability Services on campus for students. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated to faculty in an accommodation letter. All students are strongly recommended to discuss with their faculty the accommodations they plan to use in each course. Faculty who receive Letters of Accommodation with Disability Related Flexible accommodations will need to fill out the Disability Related Flexibility Agreement. Any questions from faculty or students on the agreement should be directed to the SAS specialist who is indicated on the letter.

**Contact SAS:**

A170 Living/Learning Center;

802-656-7753

[access@uvm.edu](mailto:access@uvm.edu)

[www.uvm.edu/access](http://www.uvm.edu/access)

**Grade Appeals:** If you would like to contest a grade, please follow the procedures outlined in this policy: <https://www.uvm.edu/policies/student/gradeappeals.pdf>

**Grading:** For information on grading and GPA calculation, go to <https://www.uvm.edu/registrar/grades>

**Code of Student Conduct:** <http://www.uvm.edu/policies/student/studentcode.pdf>

**FERPA Rights Disclosure:** The purpose of this policy is to communicate the rights of students regarding access to, and privacy of their student educational records as provided for in the Family Educational Rights and Privacy Act (FERPA) of 1974.

<http://catalogue.uvm.edu/undergraduate/academicinfo/ferparightsdisclosure/>

**Promoting Health & Safety:** The University of Vermont's number one priority is to support a healthy and safe community.

Center for Health and Wellbeing:

<https://www.uvm.edu/health>

Counseling & Psychiatry Services (CAPS)

Phone: (802) 656-3340

C.A.R.E. If you are concerned about a UVM community member or are concerned about a specific event, we encourage you to contact the Dean of Students Office (802-656-3380). If you would like to remain anonymous, you can report your concerns online by visiting the Dean of Students website at <https://www.uvm.edu/studentaffairs>

**Final Exam Policy:** The University final exam policy outlines expectations during final exams and explains timing and process of examination period. <https://www.uvm.edu/registrar/final-exams>

**Alcohol and Cannabis Statement:** As faculty members, we want you to get the most you can out of this course. You play a crucial role in your education and in your readiness to learn and fully engage with the course material. It is important to note that alcohol and cannabis have no place in an academic environment. They can seriously impair your ability to learn and retain information not only in the moment you may be using, but up to 48 hours or more afterwards. In addition, alcohol and cannabis can:

- Cause issues with attention, memory and concentration
- Negatively impact the quality of how information is processed and ultimately stored
- Affect sleep patterns, which interferes with long-term memory formation

It is our expectation that you will do everything you can to optimize your learning and to fully participate in this course.

## Tentative Course Schedule

Please note some lectures will be pre-recorded, and will be available to view anytime during the week

\*Written assignment Due

2/2 Introduction & Cannabis history McHenry

2/4 Cannabis business, law & policy McHenry

### Section 1. Plant Biology

2/9 Plant taxonomy McHenry

2/11 Plant omics McHenry

2/16 Plant ecology and evolution McHenry

2/18 Plant Chemical Production McHenry

### Section 2. Cannabis Chemistry

2/23\* Chemical phenotypes of cannabinoids Dostmann

2/25 Pharmacological actions of cannabinoids Dostmann

3/2 Town Meeting Day

3/4 **EXAM 1**

3/9 Human Cannabinoid Pharmacokinetics Dostmann

3/11 Cannabinoids as drug targets Dostmann

3/16 Metabolism of Cannabinoids Dostmann

3/18 Field Testing of Cannabinoids Dostmann

### Section 3. Biological Effects on Humans

3/23\* Psychiatric responses to Cannabis Lounsbury

3/25 Biological basis of Cannabis addiction Lounsbury

3/30 **EXAM 2**

4/1 Effects of Cannabis on Pain and Nausea pathways Lounsbury

### Section 4. Clinical Research

4/6 Cannabis and the Endocrine System Carr

4/8 Cannabinoids for inflammation and pain Freeman

4/13 Public Health and Safety impacts Freeman

4/15 Break

4/20 Cannabinoids for seizure disorders Freeman

4/22 **EXAM 3**

4/27 Cannabinoids for motor disorders Lounsbury

4/29 Cannabinoids for cancer and associated symptoms Lounsbury

5/4 Cannabis and Mental health Lounsbury

5/6 Cannabis—Social deviance and early/late adapters Lounsbury

5/11 Industry Panel

**FINAL EXAM**