Sample Syllabus
Cannabis **Plant Biology**
Certificate Program

Faculty

Program Director:

Monique A. McHenry, PhD
Assistant Professor of Pharmacology

Program Facilitator:

Linda Klumpers, PhD

Content Experts:

Heather Darby, PhD
Extension Associate Professor of Plant Soil
Science

Wolfgang Dostmann, PhD
Professor of Pharmacology

Scott Lewins, PhD
Adjunct Lecturer of Plant Soil Science
University of Vermont

Willy Cats-Baril, PhD
Associate Professor of Business
University of Vermont

John McPartland, DO
Family Medicine
University of Vermont

John MacKay, PhD
Senior Director, Strategic Technologies
Waters Technologies

Kalev Freeman, MD, PhD
Assistant Professor of Surgery and
Pharmacology

Taylor Readyhough

Vinnie Zachary

Program Description

The *Cannabis* plant has an interesting history, and recent policy changes have led to an explosion in *Cannabis* science. Modules intersperse historical, political, and social background information with more advanced scientific concepts in plant biology, agriculture, and pharmacology.

We developed this program to provide students with a foundation of the scientific and technical background to understand how cannabis is grown and made into therapeutic products today. The course will be divided into six areas of content: 1) history, law, policy, and business 2) plant biology, 3) plant chemicals, 4) horticulture, 5) post-harvest processing, and 6) cannabis effect on humans. The 7th week will be a summary of the entire program content with student presentations. The 8th week will be a career development module designed to help students leverage their certificate for future career goals. This program will provide students with a foundation of up-to-date knowledge in a complex and evolving area of science, while introducing key concepts in business, plant biology, pest management, and pharmacology.

Program learning goals

This program is intended to be a unique experience for students to develop a broad understanding of *Cannabis*, with more advanced concepts relevant to plant biology, agriculture, and pharmacology in the context of the following specific objectives:

1. Identify the key legal issues around industrial hemp agriculture and *Cannabis* for therapeutic use.
2. Understand *Cannabis* as a diversifying plant, including the taxonomic confusion, human influence, and natural evolution.
3. Utilize a balanced academic approach to dispel myths surrounding the factors that affect *Cannabis* growth and its chemical composition.
4. Discuss the best practices employed in *Cannabis* agriculture.
5. Critically review and assess the current evidence for safety and efficacy of *Cannabis* and cannabis-based products.
6. Describe the pharmacology of *Cannabis* and cannabis-based products.

Materials

Required:
    There is no required textbook, but readings will be distributed online to students.

Recommended Texts and Readings:
    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.

McPartland, John, R.C. Clarke, and D.P. Watson. 2000. *Hemp Diseases and Pests: Management and Biological Control.* NY: CABI Publishing.

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.

Online Class Space:
As part of your enrollment in the Program, 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 have live seminars in our meeting space, Microsoft Teams. We have provided information about joining Microsoft Teams as a guest.

Course Work

We estimate that students will be engaged in around 10 hours a week of course instruction. This will be a combination of readings, viewings, class discussions, live seminars, assignments, and research.

Performance Goals:
This is a noncredit, certificate-based course. At the conclusion students will receive a certificate of completion instead of a letter grade. To receive the certificate, students must earn a 70%, or greater, based on the following criteria:
1. Attendance and Participation
   ● Students can miss a week without any penalty but will be required to make up the assignments at a *prior* date. Please notify us at the beginning of the program if you are not able to participate in an online module.
   ● Timely completion and participation in class discussions online.
   ● Participation in the live seminars by submitting a question for the speaker prior to the seminar. Students do not have to be actively logged in to participate. Please notify us at the beginning of the program if you are not able to participate in a live seminar.
2. Compilation of a nomenclature review
3. Completion of a safety-testing report.
4. Completion of Final Presentation.

All students will be required to submit written assignments that will require outside research. Students will use the program material and at least one outside source to review and to form evidence-based projects.

We will use the following tentative evaluation scheme:

Successful completion of module quizzes	5%
Participation in Class Discussions	35%
Nomenclature Review	15%
Safety-Testing Report	15%
Final Presentation	30%

Discussion Boards and Peer Review:

Our class discussion forum is an important part of our learning experience. We will utilize peer review as a way to share your current expertise and apply our learning objectives. By participating in discussions, you will broaden your understanding of the course content and enhance your ability to think critically. Topics for class discussion and corresponding questions will be suggested for class discussion during weeks 1, 3, 5 and 8. We also ask you to utilize YellowDig to post your introduction and final presentation assignments in weeks 1, 4, and 7.

Here is how it will work. You need to earn a total of 210 points for discussion for the course. We have 7 required postings on YellowDig:

1. Introduction (Week 1)
2. Class Discussion (Week 1)
3. Class Discussion (Week 3)
4. Final Presentation Selection (Week 4)
5. Class Discussion (Week 5)
6. Final Presentation Submission (Week 7)
7. Career Exploration (Week 8)

 The collection of points begins Monday at 12:01am and runs until the following Sunday by midnight. You need to earn 30 points by posting, commenting, and interacting with your classmates for each assignment in Yellowdig. You can *only* earn a maximum of 30 points for each assignment in YellowDig. It is up to you to earn your points for each assignment by replying to the prompts provide in the modules. You can mix and match posts and replies to receive your max of 30 points/assignment. Your earned assignment points in Yellowdig will automatically be transferred into Blackboard. Each action is worth certain points as follows:

- A new post of at least 50 words earns 15 points
- A comment of at least 20 words on an existing post earns 10 points
- If your post generates comments, you receive 2 points for each of them
- Receiving a reaction from another user earns 1 point

 These ONLINE interactions help foster discussions, as well as allow us to get to know one another in a course where we have no in-person interactions. We expect your posts to be

professional and courteous. Please keep the following in mind as you post in terms of the quality expected for posts:

- You respond to the assignment in depth, with concise posts (of 250 words or less) and responses (of 50 words or less) while making connections between evidence-based data and insights using multiple examples.
- You own and facilitate the conversation following your original post.

When you post to the discussion board, please keep the following in mind:

- Please review the document and references on Netiquette before submitting your first post.
- Keep your post focused on the topic, relate class materials from the current module in your post.
- Proofread and review before you submit your thoughtful and evidence-based response.
- Participate regularly. Improve your learning by being an active and engaged student. Successful students post early in the week, and then follow and participate in the assigned discussion throughout the module. You will be expected to log on at least three times a week while reading and participating in discussion.
- If you are unable to fully participate in a week, please contact us.

Quizzes:

In Modules 1-6 there will be a five-question quiz to test your learning of the key concepts presented in each module. The quiz questions will be objective (true/false, multiple choice) and you will have three opportunities to take each quiz. The quizzes are accessible via the assignments page.

Live Seminars:

There will be one orientation live session and three 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. **Live seminars will meet Thursday in Teams at the time assigned in the module (please note all times are EST)**. Please view the information about joining Microsoft Teams as a guest and try using Microsoft Teams before the start time. Live participation in the seminar is not required, but encouraged; however, it is required that each student submits one question for the speaker to get participation credit prior to the seminar, **by the assigned deadline found in the Module**. Additionally, if you cannot participate in the live seminar, you will be expected to watch the recorded session at a different time.

Citations:

We require students to use MLA format to list your citations. What does this mean? 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." One example of citing an in print academic journal as shown in the University of Maryland online guide: Jordan, Stephanie. "Mark Morris Marks Purcell: 'Dido and Aeneas' as Danced Opera." Dance Research, vol. 29, no. 2, 2011, pp. 167-213.

Course Schedule:

Online Session	Materials and **Assignments**	Subject Matter Experts
Program introduction; Cannabis History, Law & Policy, Business, and Knowledge Gaps	1. Review the materials in the Getting Started section in Blackboard 2. Presentations (4): History; Law & Policy; Business; Knowledge Gaps **3. Live course orientation** **4. Introduce yourself in YellowDig** **5. Class Discussion in YellowDig** 6. Quiz #1	Monique McHenry, Willy Cats-Baril
Cannabis Plant Biology	1. Presentations (3): Taxonomy; Omics; Ecology and Evolution **2. Live Seminar** **3. Submit Nomenclature Review in Blackboard** **4. Quiz #2**	Monique McHenry, John McPartland
Cannabis Chemicals	1. Presentations (3): Plant Chemicals I: Terpenes; Plant Chemicals II: Cannabinoids; Plant Chemical Production **2. Review Final Presentation guidelines** **3. Class Discussion in YellowDig** **4. Quiz #3**	Wolfgang Dostmann, Monique McHenry
Cannabis Agriculture	**1.** Presentations (4): Pests and Diseases; CEA; Outdoor Hemp Agriculture; IPM **2. Final Presentation selection post to YellowDig** **3. Live Seminar** **4. Quiz #4**	John McPartland, Taylor Readyhough, Heather Darby, Scott Lewins
Cannabis Post-Harvest Processing	1. Presentations (3): Post-Production; Extraction and Analytical Testing; Extraction and Manufacturing **2. Class Discussion in Yellow Dig** **3. Submit Safety-Testing Report in Blackboard** **4. Quiz #5**	Monique McHenry, Vinnie Zachary, John MacKay
Cannabis & Humans	1. Presentations (3): Endocannabinoid System;	John McPartland, Kalev Freeman, Linda Klumpers

	Modes of Administration; Basic Pharmacology 2. **Live seminar** 3. **Quiz #6**	
Program Summary	1. **Submit Final Presentation to Yellow Dig** 2. Review your peers' final presentations	You
Career Development	1. Presentation: Cannabis job	Industry professionals

Intellectual Property Statement/Prohibition on Sharing Academic Materials:
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.
You are expected to maintain a high standard of academic honesty. Please read about UVM's Academic Honesty Policy at http://www.uvm.edu/policies/student/acadintegrity.pdf
Be particularly careful to avoid plagiarism when working on written assignments.

Religious holidays: You have the right to practice the religion of your choice. Please submit in writing to your instructors by the beginning of the first week of the program your documented religious holiday schedule for the semester. Faculty must permit students who miss work for the purpose of religious observances to make up this work.

Disclaimer and Disclosure

- We will discuss investigational drugs not approved for use in the United States during this program.
- Materials presented here represent faculty's own findings, views and opinions and should not be taken as a statement, position, opinion, or endorsement by the University of Vermont.
- Potential conflicts of interest exist between course faculty and multiple industry partners.
- All potential conflicts of interest have been resolved prior to the start of this program.