THE UNIVERSITY OF VERMONT
PLANT AND SOIL SCIENCE

CATAMOUNT FARM

PSS 120 Cold Climate Viticulture

Summer 2023, Tuesdays and Thursdays, 8:30 am – 3:30 pm. Three Credit Hours.
June 20-July 13.

UVM Horticulture Research and Education Center
65 Green Mountain Drive, South Burlington, VT 05403
Students are responsible for transport to the HRC for class each day.
Directions to the Hort Farm:
http://www.uvm.edu/~hortfarm/?Page=directions.html

Dr. Terence Bradshaw, tbradsha@uvm.edu. (802) 922-2591

Pre-requisites
PSS 010 or 021 or equivalent experience or instructor permission.

Course Modality

Course Modality

This is a hands-on, experiential course is being in an *In-Person* format.

Course Description

Students will learn principles and practices of commercial cold-climate grape production, including: site selection and preparation; cold hardiness development; varietal selection; vine training and trellising systems; nutrient, water and pest management; harvest and postharvest considerations, including basic winemaking principles. Special emphasis will be placed on environmental and economic sustainability of the vineyard operation. The class will apply knowledge of integrated horticultural and pest management practices in a real vineyard setting. Pre/co-requisites: PSS 10 or 21 or 1 semester biology or permission. The class format will consist of a combination of classroom lectures, hands-on fieldwork, and visits to local commercial vineyards.

Overall Course Learning Objectives

Students enrolled in this course will:

1. attain a basic level of knowledge of grapevine botany and specific conditions required for crop production.
2. develop an understanding of the horticultural and farm-management practices required to successfully operate a vineyard in Vermont.
3. learn critical concepts and methods for crop protection, including organic methods and with an emphasis on Integrated Pest Management
4. engage critically with class material and make connections with how these drivers shape vineyard systems and inform on-farm decision making.
5. Students will apply their knowledge and develop a farm plan which can be used for many potential purposes including monitoring and evaluation, applications for financing, etc.

There are specific learning objectives for each module. See Course Schedule for more details.

Contacting course instructors or TAs:

The default method for contacting the course instructor or TA is via email.
All emails should begin with the subject line "[PSS 120]…"
This will allow for incoming messages to get flagged and not missed in overstuffed inboxes. Please use professional language in emails. Text messaging is not an appropriate method for communication with instructors and teaching assistants. My personal cell phone number is listed at the top of this syllabus, use it only in an emergency and not during or immediately prior to class meeting time.

Course Structure and Pedagogy

Class format will consist of a combination of synchronous in-person lectures, at-farm demonstrations and activities, and field trips to area vineyards.

Pedagogy will employ a combination of readings, lectures, homework, in-class exercises, planning assignments, and peer review. Students are expected to be resourceful in acquiring the relevant evidence to support their homework assignments and final class project.

Required Course Materials:

Appropriate course readings will be posted on Blackboard. The primary course text will be:

•Wolf, T.K., editor. 2008. Wine Grape Production Guide for Eastern North America. Northeast Regional Agricultural Engineering Service, Cornell Coop. Ext., Ithaca, NY. NRAES-145.

I have placed a pdf copy on Blackboard, please download and read as appropriate. Hard copy versions are somewhat hard-to-find and expensive, but are well-worth the cost if you'll be in this business for a while:

- https://www.amazon.com/Grape-Production-Guide-Eastern-America/dp/1933395125
-

Other books from which we will pull readings that may be helpful in this course and future viticultural endeavors:
•Dami, I, B. Bordelon, D.C. Ferree, M. Brown, M.A. Ellis, R.N. Williams, and D. Deehan. 2005. Midwest Grape Production Guide. Ohio State Univ. Ext., Bull. 919-05. (pdf on blackboard)
A print copy can be ordered here: https://extensionpubs.osu.edu/midwest-grape-production-guide/

•Plocher, T. and R.J. Parke. 2008. Northern Winework: Growing Grapes and Making Wine in Cold Climates. 2nd Edition. Northern Winework, Inc. Hugo, MN. Out of print, available at Abe books, and probably Amazon.

•2022 New York and Pennsylvania Pest Management Guidelines for Grapes
http://ipmguidelines.org/grapes/

Sources and Citations

All work must include appropriate citations. Please consider the quality of sources and provide complete information in APA format (https://owl.english.purdue.edu/owl/section/2/10/). Websites may be acceptable sources of information, but consider blogs, sites without credited authors, and commercial sites as lower in quality than reputable University, Extension, and government sites.

Readings for each week's classes will be posted to Blackboard by the previous Friday. Reading reactions will be required in the weekly journal entries. Those reactions are intended to spark discussion from the readings that will be continued during some classes. Please complete readings and reactions on-time and be prepared for classroom discussion.

Guest Speakers:

We will take two or three field trips to conduct class in a commercial vineyard. Please provide these growers, who are donating their time during a busy season, respect by arriving on-time and maintaining attention.

Tentative Course Schedule (may change based on instructor or University needs)

	Module	Learning Objective	Evidence of Student Learning (What does student mastery look like?)	Content that Supports Achieving LO (In addition to weekly lecture)	Assignment(s) or Assessment(s)
6/20	Establish	1. Recognize structures important to plant and cropping functions in fruit trees. 2. Evaluate a particular land site for its potential for tree fruit production. 3. Learn initial steps for vineyard establishment	1. Successfully identify primary structures of grapevines. 2. List and explain why certain characteristics of a site are preferred for fruit production. 3. Analyze a sample site and identify pros and cons in establishing an orchard from a site selection perspective.	1. UVM Catamount Vineyard Tour 2. Discussion: site selection and economics 3. Readings: • Rombough, L. Ch 1: Structure of the vine *in* "The Grape Grower". 2005. Chelsea Green Publishing. • Plocher, T. and Parke, B. Sites for Northern vineyards *in* "Northern Winework" • Dami, et al., "Vineyard establishment" *in* Midwest Grape Production Guide pp. 33-38. 2005. Ohio State University.	1. In-class observations journal 2. In-class site assessment 3. In-class botany quiz
6/22	Adjust	1. Understand how canopy management affects vineyard productivity and fruit quality. 2. Consider how crop load can be adjusted for optimum wine quality. 3. Consider economic considerations of vineyard operation.	1. Practice and demonstrate typical summer canopy management in high wire cordon vines. 2. Calculate optimum crop load and demonstrate appropriate adjustment in the vineyard. 1. Analyze vineyard profitability given multiple scenarios	1. Field walk and canopy assessment 2. Field practical: shoot positioning 3. Readings: • Reynolds, A. & Wolf, T. "Grapevine canopy management", *in* Wine Grape Production Guide for Eastern North America. 2008. NRAES publication 145. Ithaca, NY. • Wolf, T. "Crop yield estimation and crop load adjustment", *in* Wine Grape Production Guide for Eastern North America. 2008. NRAES publication 145. Ithaca, NY. • Cannella, M.P. 2015 Vermont Vineyard Feasibility Study (FBRR 014: University of Vermont Extension).	1. Field work: Canopy management at Catamount Vineyard (Video assignment) 2. Problem set: Crop load adjustment 1. Canopy management journal

6/27	Survive	1. Understand how vines acclimate to winter cold. 2. Introduce cold-hardy cultivars. 3. Introduce working vineyard managers and the Vermont wine industry. 1.	2. Describe how vines acclimate to prepare for winter weather. 3. Explain necessary steps to improve winter hardiness. 1. Professionally interact with vineyard and winery staff.	1. Field trip a. Mad Meadows Vineyard b. Montpelier Vineyards 2. Readings: • White, M. Winter Injury to Grapevines and Methods of Prevention • Wallis et al., "Wine Grapes for New York's North Country: The Willsboro Cold Climate Variety Trial. 2017. Appellation Cornell. 1. Smiley et al., "A review of cold climate grape cultivars." 2016. ISU Extension HORT 3040.	2. Vineyard observation journal. 3. Online cold hardiness quiz 1. Cultivar assignment (due 7/4)
6/29	Observe	1. Understand pest management concepts and principles. 2. Apply quantitative measure to spray applications	1. Identify the interaction between vine growth status, weather, and disease risk. 2. Calibrate vineyard sprayer for optimum performance. 2.	1. Wild vine walk 2. Sprayer calibration exercise 3. Readings: • Landers, A. "Sprayer Technology", *in* 3013 New York and Pennsylvania Guidelines for Grapes • Rombough, L. "Growing Grapes Organically", *in* "The Grape Grower". 2005. Chelsea Green Publishing.	1. Sprayer journal 2. Problem set: sprayer calibration
7/4	Protect	1. Identify critically important vineyard pests and diseases. 2. Understand critical, key practices necessary to implement IPM	1. Recognize and recall major diseases and pests of grapes observed on a field walk. 3. Recall a typical IPM program for cold-climate grapes.	1. In-class presentations 2. Vineyard walk 3. Readings: • Wilcox, W. "Disease Management", in Wine Grape Production Guide for Eastern North America. 2008. NRAES publication 145. Ithaca, NY. • Pfeiffer, D. "Insect Management", in Wine Grape Production Guide for Eastern North America. 2008. NRAES publication 145. Ithaca, NY.	1. Present your pest paper 3. Pest journal

7/6	Train	2. Understand key concepts in grapevine pruning & training. 3. Recall key trellis construction concepts and requirements.	3. Demonstrate proficiency in managing grapevines for training purposes. Solve a trellis construction puzzle	2. **Field trip** a. **Snow Farm Vineyard** b. **Ellison Estate Vineyard** 3. Zabadal, T. "Engineering a modern vineyard trellis." n.d. MSUE. 4. Dami et al., Trellis construction, *in* p. 37-38 Midwest Grape Production Guide. 2005. Ohio State University. 5. Dami et al., "Pruning and training", *in* p. 39-49 Midwest Grape Production Guide. 2005. Ohio State University.	3. Training systems journal 2. Trellis puzzle
7/11	Nurture	1. Identify important mineral nutrient applications necessary for optimum vine growth and production. 2. Consider groundcover management options in vineyards	1. Calculate mineral nutrient additions from a soil and petiole test. 2. Identify and apply commercially and horticulturally-effective weed management practices.	1. **Field trip:** a. **Shelburne Vineyard** 2. Readings: • Bates, T. "Nutrient management", *in* Wine Grape Production Guide for Eastern North America. 2008. NRAES publication 145. Ithaca, NY. • Appendix 1. Wine Grape Production Guide for Eastern North America. 2008. NRAES publication 145. Ithaca, NY. • Dierdre??	1. Weeds journal
7/13	Enjoy	1. Understand grape ripeness metrics 2. Consider primary winemaking steps and relation to harvest management. 3. Present your farm plan to your peers.	1. Evaluate grapes for ripeness using qualitative and quantitative methods. 2. Discuss winemaking styles, methods, and economic considerations. 2. Deliver a 10 minute professional presentation to convince stakeholders to invest (time, money, other consideration) in your operation.	1. Readings: • Plocher, T. and Parke, B. Ch.11-13, Winemaking basics *in* "Northern Winework • Giese, W.G. "Wine grape quality: When is it time to pick?", in Wine Grape Production Guide for Eastern North America. 2008. NRAES publication 145. Ithaca, NY. •	1. Final assignment due **June 18** 2.

Blackboard and other electronic communications:

UVM Blackboard is the primary tool for course management and all assignments must be submitted and will be grade via that system. In the event of a Blackboard outage, alternative electronic means for submitting assignments will be presented. If assignments are accepted via email, and announcement will be made prior to submission which will include specific instructions for tagging subject lines in order to track assignments. Assignments should not be turned in as paper copies unless otherwise stated. *Assignments will not be accepted via cloud services such as Google Docs. Please read that again.*

Students are expected to pay attention in class and to not use electronic communications for non-course purposes. However, we are well-into the 21st century and computers and phones are critically important methods for acquiring and sharing information. I may poll the class during meetings to provide input on certain topics, so the ability to contribute in real-time will be valuable. Feel free to bring your laptops and phones to use for these purposes. Cell phones should always be muted in class, and thumbs should not be idly scrolling screens.

Attendance Policy and Classroom Environment Expectations:

This course meets only one day per week, so any absence can result in a full week of missing class. Students are expected to attend and participate in class discussion. Students are specifically expected to attend, arrive on time, and show respect for guest speakers who are often volunteering their time. Tardiness and absences will affect the professionalism component of your grade.

1. If you are ill and missing only one day of classes, you can contact class professors by phone or e-mail directly and leave a clear message including your name, and that you are ill and will be missing the class.
2. If you are ill for 2 or more classes or experiencing a personal problem that will cause you to miss more than a day of classes, you must contact Whitney Northrop in the CALS Student Services Office or Student Services in your college. She will notify the instructors for you, but you will also need to work with your instructors to discuss his/her expectations in reference to your absence.
3. It is important that you as the student (not your advisor and not your parent) contact Student Services directly if at all possible. By doing so, we will have a very clear understanding of the nature of the illness or problem and how we can best help you.

Grading Criteria/Policies:

- All grading will be completed on Blackboard. Grading rubrics for assignments will be available and viewable.
- Late assignments: As an iterative and reflection-driven course, it is important to keep up with the assignments. Assignments will automatically be deducted 10% of the total grade for each day late. No assignments will be accepted after five days unless the absence has been approved by CALS Student Services. *Please read that again*.
- This course uses the standard Blackboard grading schema to convert numeric to letter grades. Numeric grades are not rounded to the next highest integer: an 89.9 is not a 90.

GRADING SCHEMA USED FOR THIS COURSE

	minus (−)		plus(+)
A	90-93.$\overline{9}$	94-96.$\overline{9}$	97-100
B	80-83.$\overline{9}$	84-86.$\overline{9}$	87-89.$\overline{9}$
C	70-73.$\overline{9}$	74-76.$\overline{9}$	77-79.$\overline{9}$
D	60-63.$\overline{9}$	64-66.$\overline{9}$	67-69.$\overline{9}$
F		<60	

- *Special requirements for Graduate Students taking the course:*
  This is a 200-level course, and as such, it is aimed primarily toward upper-level undergraduate students and is designed to focus on and assess integration and presentation of knowledge and concepts. It is, however, also approved for graduate credit without a separate section. Students who are taking this course for graduate credit must inform me of such designation the first week of class. Graduate student assignments and activities are the same as for undergraduates, but the word length, citation expectations, and general rigor is expected to be greater. I will publish a separate addendum within each assignment that includes extra effort required for graduate credit. For example, graduate student journal; entries are expected to be 500-800 words in length, and should reference at least one outside

source of information for context.
There will be no 'D' grades given to graduate students, the minimum passing grade for them is 70.

- As a rule, I do not negotiate with students over minor grade corrections on assignments. For every student who feels they received a subjectively low grade on an assignment, there are multiple students who likely received a subjectively high grade. If you feel like there was an egregious grading error on any given assignment, by all means discuss it with me, but it is highly unlikely that the grade will change unless a strong and compelling case is made. In my experience after assigning hundreds of course grades, any student can achieve a high grade in my courses by simply staying up on readings, attending and participating in class, and completing assignments on-time and according to the instructions.
- If you would like to contest a grade, please follow the procedures outlined in this policy: https://www.uvm.edu/policies/student/gradeappeals.pdf.
- For information on grading and GPA calculation, go to https://www.uvm.edu/registrar/grades.

Assessments (Graded Work):

Project, 25%:
Students will collaboratively develop and present a farm management plan for a commercial fruit farm. This is a summative assignment in lieu of an exam.

Field Practicals and Homework, 25%:
Applied, hands-on activities will be performed in vineyards to develop skills introduced in classroom lectures. Students will be assessed on: pruning, canopy management; cropload assessment and adjustment; fertility plan development based on soil and plant tissue analysis; and presentation of key pests of orchard and vineyard plantings and methods for their management.

Pest presentation: 10%
You will present to the class on a key insect/arthropod, disease, weed, or other pest and how to manage it.

Quizzes, 25%:
Topical written or otherwise presented assignments will cover material for a particular period.

Professionalism, 15%:
Students are expected to attend all classes, participate in activities, and be engaged in a professional manner.

Course Evaluation:

Students are expected to complete an evaluation of the course at its conclusion. Evaluations will be anonymous and confidential, and that the information gained, including constructive criticisms, will be used to improve the course.

Student Learning Accommodations:

The primary goal for this course is for students to achieve learning objectives, not to meet deadlines and complete assignments. That said, the framework provided by the coursework and due dates is important to help us achieve that goal. It is important for students to complete readings and assignments on-time and to be prepared for class discussions. However, I understand that not every student learns the same way, and we all come into this course with other responsibilities that don't go away when we walk through the classroom door. If a short-term accommodation or adjustment to an assignment or deadline will improve your success in this course, by all means please speak to me about it. *This does not mean that I will reward laziness. Flexibility is not a replacement for you completing the coursework and maintaining the trajectory of the course.*

If you have a more substantial need than a minor adjustment to course requirements, and in keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact SAS, the office of Disability Services on campus. 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 encouraged to meet with their faculty to discuss the accommodations they plan to use in each course. A student's accommodation letter lists those accommodations that will not be implemented until the student meets with their faculty to create a plan.
Contact SAS:

A170 Living/Learning Center
802-656-7753;
access@uvm.edu
www.uvm.edu/access

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 me 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

Academic Integrity:
The policy addresses plagiarism, fabrication, collusion, and cheating.
https://www.uvm.edu/policies/student/acadintegrity.pdf

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. Resources that may be helpful include:

- UVM CALS Student Services
  https://www.uvm.edu/cals/student-services

- Center for Health and Wellbeing:
  https://www.uvm.edu/health

- Counseling & Psychiatry Services (CAPS)
  https://www.uvm.edu/health/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