

NRM 151
PLANT PROPAGATION- II. Vegetative Propagation

1 credit (1+0)

Prerequisites: none; recommended basic high school biology

Location: Arctic Health Bldg (AHRB)

Time: 6 pm Wednesdays (Oct 22 – Nov 26)

Instructor: Dr. Patricia S. Holloway

Office: 104AH Arctic Health Building; Georgeson Botanical Garden (Fairbanks Experiment Farm)

Office hours: before class

Telephone: (907)474-6686

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Textbook: none; readings and videos on Blackboard

Course Description:

Principles and practices of plant propagation useful in horticulture, botany, forestry, agronomy, revegetation and land reclamation projects and plant research. Course will cover methods of vegetative propagation including cuttings; layering; grafting; bulb, corm and tuber propagation; and micro propagation through tissue culture. Emphasis will be on Alaska native and economically useful plants. Spore propagation of ferns will also be covered

Prerequisite: none

Recommended: basic course in high school biology. (1+0)

Goals and Objectives:

The propagation of plants by seeds, cutting, grafting and more is the foundation of plant-based natural resources management. This course is part two of a three-part series exploring the theory and methods of propagating plants. It is designed to provide natural resource managers with basic knowledge in plant regeneration by vegetative means such as cuttings, specialised stems, grafting and tissue culture. These methods form the basis for the science of horticulture. The lectures and assigned activities explore the fundamental basis for reproduction in plants and the methods by which we use natural processes to propagate plants for use in horticulture, agronomy, forestry, revegetation and reclamation.

Student Learning Outcomes:

It is expected that you will become familiar with the theory and practice of plant vegetative propagation sufficient for entry level work in a commercial greenhouse/nursery or fields that require information on revegetation and reclamation such as mining, highway and forest revegetation; propagation of plants for home and garden use; and sharing propagation information with others. You will develop a working knowledge of vegetative propagation terminology and techniques to allow you to pursue specific

interests as well as practice problem-solving skills for researching and making management decisions in resources management.

Instructional Methods: The basic course will use Blackboard as the main interface for exams, presentation of videos, YouTube and more.

- 1) Online or classroom powerpoint lecture
- 2) Audio/video demonstrations using Powerpoint, Camtasia, Youtube
- 3) Propagation terms- a combination of puzzles, quizzes, matching, short answer
- 4) Situational essays: short essays answering questions about how vegetative propagation methods are used in natural resources management that require independent research of literature, analysis and problem solving
- 5) Videos or production practices for seeds
- 6) In-class or distance discussions about the biology and/or business of vegetative propagation

Technology Requirements:

One section of this course will be online and will use several multimedia technologies accessible through Blackboard. Lectures will be recorded using Powerpoint/Camtasia/Youtube and will require audio and video capabilities. There are no requirements to purchase additional software. Students will be expected to have the most current versions of several applications that will be used in this course, including [QuickTime](#), Flash ([Mac](#)|[Windows](#)), [iTunes](#) and [Java](#). Before the first online class meeting, please visit the [OIT website](#) to make sure all of your systems are up to date.

Evaluations:

1.	Weekly vocabulary quiz/game, etc. (5)	100 points	A=90-100%
2.	Situational essays (5)	125	B=80-89%
3.	Video/reading commentaries	25	C=70-79%
4.	Propagation project (final)	50	D= 60-69%
5.	Final exam	50	F= below 60%
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Weekly vocabulary quizzes: (20 points each, 100 points) A weekly quiz (open book) will be given using a variety of tools such as crossword puzzles, short answer, fill in the blank, etc. that give students opportunities to learn the unique vocabulary of plant propagation. There will be 12 quizzes in a semester and must be completed on Blackboard within one week of the class time.

Situational Essays: (25 points each, 125 points) An essay question will be given approximately every two weeks that require a search of the literature and exploration of the seed industry. Essays will be 500 words or less and must include referenced sources of information. They will be made available on Blackboard and will be due one week from assigned date. A required citation style will be provided.

Video/reading Commentaries (5 points each; 25 point): One question will be given weekly on the readings, videos requiring a short answer, essay.

All papers must be typed or printed in legible writing. It is preferred that you hand in papers on Blackboard, but they also may be handed in, in class. Make sure your name is on all papers.

Exams: One final exam will be given, a propagation paper and a final. Using a mixture of short answer, fill in the blank, and essay, the exams will cover a review of materials for the entire course. The second part of the final will be to research and complete a chart on propagation protocols for a plant of your choice. The choice must be approved by the instructor as one that is known to be vegetatively propagated. The paper must include references.

Course Policies:

Plagiarism and Academic Honesty

Plagiarism is using what another person has developed as your own words or thoughts. Plagiarism is never acceptable. UAF requires students to conduct themselves honestly and responsibly and to respect the rights of others. Cheating, plagiarism or other forms of academic dishonesty may result in disciplinary action and sanctions. The [UAF Student Code of Conduct](#) is adhered to in this course.

Disability Services

The UAF Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. Your instructor will work with the [Office of Disability Services](#) (208 WHIT, 907-474-5655) to provide reasonable accommodation to students with disabilities.

UAF Disability Services for Distance Students

UAF has a Disability Services office that operates in conjunction with the College of Rural and Community Development (CRCDD) campuses and UAF Center for Distance Education (CDE). Disability Services, a part of UAF Center for Health and Counseling, provides academic accommodations to enrolled students who are identified as being eligible for these services. If you believe you are eligible, please visit the [Office of Disability Services](#) on the web or contact a student affairs staff person at your nearest local campus. You can also contact Disability Services on the Fairbanks Campus at (907) 474-5655, fydso@uaf.edu.

Make up quizzes and exams will be given only in emergency situations (Note from Dean, Physician, Employer).

Incomplete grades: Incompletes will be given only in the case of family or medical emergencies or circumstances beyond your control. You must have a C- or better average in the class, have attended all of the classes and labs, and shown good progress toward completing the course BEFORE the emergency in order to receive an incomplete grade.

Audits: Auditing the class is accepted but not recommended. You must complete all work, including the exams, readings and lab reports. They simply won't be graded. If exams, etc. are not completed, the instructor will initiate a withdrawal from the class.

Spelling and Grammar: On all written papers including lab reports and exams, you will lose points for poor spelling and grammar.

Tentative Schedule (by topic)

1. Asexual or vegetative propagation – introduction - how vegetative propagation is used in horticulture, forestry, agronomy, wildland restoration, landscaping. A broad overview of the importance of asexual propagation and examples of it used professionally around the world
2. Major concerns with vegetative propagation: viruses, mutations and how they are managed.
3. Cuttings: vegetative shoot anatomy, where roots/shoots come from, adventitious organs Chimeras- definition, how they arise, to good and bad of chimeras
4. Commercial stock plant production and nurseries
5. Cuttings, callus and development; environmental control of root development especially light, air and soil temperature, humidity, propagation medium (quiz 6, video commentary 3)
6. Leaf cuttings, leaf-bud cuttings- anatomy, commercial applications; factors affecting success
7. Layerage- the art and science of layering - origin, anatomy, methods of commercial propagation; factors affecting regeneration by layerage.
8. Root cuttings- anatomy, commercial applications, factors affecting root/shoot development
9. Growth regulators and rooting- common plant hormones and how they are used in promoting root/shoot production; how they work
10. Propagation by specialized stems: bulbs, corms tubers, rhizomes, tuberous rhizomes; their origin, anatomy, methods of commercial propagation; factors affecting regeneration by specialized stems
11. Specialized structures- pseudobulbs, offsets, runners; their origin, anatomy, methods of commercial propagation; factors affecting regeneration by specialized stems
12. Grafting and Budding- definition, origin, anatomy, methods of commercial propagation; factors affecting regeneration by grafting and budding
13. Final exam/paper