CURRICULUM COMMITTEE REPORT

The Curriculum Committee met on December 10th, 2024 and is recommending the following courses to the Graduate Board for approval at its December 19th meeting.

New Courses:

PSE 502 Plant Breeding and Genetic Resources

SFR 506 Applied Remote Sensing for Forestry

Modifications:

ERS 527 Isotope Geology

NUR 506 Professional Issues in Advanced Practice Nursing

SFR 695 Graduate Seminar in Wood Science

PSE - 502 - Plant Breeding and Genetic Resources

2024/25 AY - Undergraduate/Graduate Cross Listing New Course Proposal

General Catalog Information

Undergraduate/Graduate Cross Listing New Course Proposal Form

Read before you begin

FILL IN all fields required marked with an *.

ATTACH supporting documentation.

LAUNCH proposal by clicking Validate and Launch at the top. Once the proposal has been launched, approve the proposal to move the proposal forward in the workflow.

Requested Action: ***Note*: A complete syllabus is required for all new courses, including travel-study courses offered through DLL or Summer Session. Please be sure that all elements required for a syllabus at the University of Maine are present. We recommend you work closely with the syllabus guidelines found at www.umaine.edu/citl.**

For assistance in completing this form or if you have any questions, email um.catalog@maine.edu.

New Course Career Offering* ☐ Undergraduate ☑ Graduate

Please attach any required files by navigating to the right side menu and clicking "Files".

Syllabus* ☑ Attached

(*Add SL: before the title of course. Refer to documentation on the criteria for Service-Learning at: www.umaine.edu/upcc)

NEW COURSE:* ☑ New Course

Please complete the Gen Ed section located towards the bottom of this form, if applicable.

REASON FOR NEW COURSE* This course was offered last year as a special topics and crosslisted undergrad/grad. The faculty agree that a course in plant breeding and genetics is a necessary component of Environmental Horticulture and Sustainable Agriculture. The course also attracts students in Food Science and Human Nutrition, Botany, and Environmental Sciences.

Department* School of Food and Agriculture

EFFECTIVE SEMESTER:

Semester* Spring

Year* 2025

PROPOSED CATALOG DESCRIPTION:

Course Designator* PSE

Proposed Course #* 502

Short Course Title (The short course title will reflect on the Class Section in MaineStreet and on the student's transcript). * Plant Breed and Gen Resources

Long Course Title* Plant Breeding and Genetic Resources

Course Description:* A general introduction to plant breeding principles and genetic resources. The course content will focus on the genetic basis of plant breeding and explore concepts on plant breeding, crop sciences, and related disciplines. The course will cover how plant breeding contributes to a more sustainable and profitable agriculture and a pathway to learning technologies applied to plant breeding. PSE 402 and PSE 502 may not both be taken for credit.

Prerequisites: PSE 402: PSE 100, or BIO 100, or SFR 100 and minimum junior standing

PSE 502: Graduate standing

Corequisites: None

** When determining the number of credit hours for your course please note the Definition of an Undergraduate Student Credit Hour as published in the Undergraduate Catalog:

Definition of an Undergraduate Student Credit Hour: The University of Maine and the University of Maine at Machias acknowledge and adhere to the federal definition of a credit hour with respect to courses offered face-to-face, in hybrid format, and online, as developed in 2010 and published in the *Code of Federal Regulations* (CFR), Title 34, Part 600.02:

[A] credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than:

(1) One hour of classroom or direct faculty instruction and a minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester hour of credit [. . .] or the equivalent amount of work over a different amount of time; or

(2) At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution[,] including laboratory work, internships, practica, studio work, and other academic work leading to the awarding of credit hours. Rev. September 2018

Credit Hours:*	3
Does it meet Service-Learning?:*	○ Yes ◉ No
Can this course be repeated for credit? *	○ Yes ◉ No
If YES, total number of credits allowed:	
If YES, total number of completions allowed:	
Can students enroll multiple times in term?	○ Yes ◉ No
Will this course be delivered using distance technology for over 50% of the class time?	○ Yes ◉ No

(* if you answered yes to either of these questions below, please consult with CITL as soon as possible: https://umaine.edu/citl/instructional-design-2/)

Will this course be a travel study course? (If you answered yes, please contact the Division of Lifelong Learning as soon as possible for approval: https://dll.umaine.edu)*	○ Yes ◉ No

Curriculum Changes *	(•) YES, I have submitted curriculum changes documenting how this new course will add to/change the degree requirements for any relevant majors/minors. ( ) NO, this course will not be added to any lists of requirements, and therefore I have not submitted curriculum changes for it.

If you answered yes, please attach an edited copy of the current catalog with proposed changes or memorandum with proposed changes.

If you answered yes, please include relevant curriculum changes here along with any edits that will be necessary with the addition of this course.	This course will be listed under the PSE Electives in the ENH and SAG Majors.

(For information on Course Components Definitions please see: UMS Data Governance Course Components Definitions)

COMPONENTS (type of course/used by Student Records for MaineStreet*	☐ Applied Music ☐ Clinical ☐ Field Experience ☐ Independent Study ☐ Laboratory ☑ Lecture ☐ Recitation ☐ Research ☐ Seminar ☐ Simulation ☐ Studio ☐ Thesis ☐ Travel Course
When will this course typically be offered *	☐ Fall ☐ Summer ☑ Spring ☐ Alternating ☐ Variable
TEXT(S) PLANNED FOR USE*	Breeding Field Crops - 4th or subsequent edition. Authors: J.M. Poehlman and D.A. Sleper. Publisher: Blackwell Publishing.
COURSE INSTRUCTOR*	Mario Andrade 25 % teaching load
Are additional resources required for this course?:*	( ) YES, please list additional resources required and note how they will be funded or supported. (•) NO, the department will not request additional resources for this course, now or in the future, unless the request is accompanied by an explanation of how the increased funding or other support is to be provided.
Additional Resources Required	

For any resources needed for this course that the instructor is seeking to secure from, or access through, Fogler Library, has Fogler's Head of Collection Services affirmed their availability? *	○ YES, Fogler has affirmed that it has the digital and/or print resources needed for this course. ◉ NO, Fogler has not affirmed that it has the digital and/or print resources needed for this course (or, has confirmed that it cannot supply them).

If you answered NO above, please plan accordingly as you prepare to deliver your course.

Will offering this course result in overload salary payments (either through the college or DLL) either to the instructor of this course or to anyone else as a result of rearranging teaching assignments? If yes, please explain:*	No, onload
Does the content of this course overlap significantly with other University courses? If so, list the course, explain the overlap, and justify the need for the proposed course.*	No overlap
What other department/programs are affected? Have affected departments/programs been consulted? Have any concerns been expressed? Please explain:*	Should not affect any departments or programs. This is an elective course.

PSE 402/502 – Plant Breeding and Genetic Resources
Spring 2025

Meeting times: Tuesdays and Thursdays, 11:00 am – 12:15 pm
Location: Deering Hall - Room 17
Prerequisites: For 402: PSE 100, or BIO 100, or SFR 100 and minimum junior standing
For 502: graduate standing
Credit hours: 3

Instructor:
Dr. Mario Andrade
414 Deering Hall
207-581-2997
mario.murad@maine.edu

Office hours:
By appointment. Drop-ins welcome!

Course description: A general introduction to plant breeding principles and genetic resources. The course content will focus on the genetic basis of plant breeding and explore concepts on plant breeding, crop sciences, and related disciplines. The course will cover how plant breeding contributes to a more sustainable and profitable agriculture and a pathway to learning technologies applied to plant breeding. PSE 402 and PSE 502 may not both be taken for credit.
Course content: Course content includes plant domestication, center of origin, genetic diversity, and germplasm sources. We will also cover reproduction in crop plants, Mendelian inheritance and linkage, quantitative inheritance in breeding, heritability, breeding self-pollination, cross-pollination, clonally propagated crops, and hybrid cultivars. Molecular techniques and biotechnology that are applied to plant breeding will also be reviewed.

Course goals: The broad goal of this course is to serve as a general introduction to the principles of plant breeding through lectures and literature review. Underlying genetics principle of inheritance and plant breeding methodologies using conventional techniques, and biotechnology will be covered.

Student Learning Outcomes: After successfully completing this course, you will be able to:

1) Describe the fundamental genetic principles that rule inheritance and plant breeding.
2) Explain how the reproductive models of plants impact population genetic structure and breeding strategies and schemes.
3) Describe how the most used breeding techniques for self-pollinated and cross-pollinated crops work.

4) Explain the role of plant breeding and genetic resources and their contribution to improving agronomic and horticultural crops.
5) Be able to communicate clearly using different media on topics related to plant breeding and genetic resources.

Required texts:
Title: Breeding Field Crops - 4th or subsequent edition.
Authors: J.M. Poehlman and D.A. Sleper.
Publisher: Blackwell Publishing.

Additional Recommended Study Materials:
-Title: Fundamentals of Plant Breeding – Second edition.
Author: Rex Bernando.
Publisher: Stemma Press.

-Title: Genetics: A Conceptual Approach – 4th or subsequent edition.
Author: Benjamin A. Pierce.
Publisher: W. H. Freeman.

-References to selected plant breeding/genetics articles.

Online or in-person office hours:
Mario is available for both online and in-person office hours but by appointment only. You are welcome to email me at any time or visit my office, and if my door is open, I am available to assist you.

Grading and course expectations: This course will use a standard grading approach, detailed below: Decimals will be rounded up at 0.5 or above.

A	=	93 - 100	C	=	73 - 76
A-	=	90 - 92	C-	=	70 - 72
B+	=	87 - 89	D+	=	67 - 69
B	=	83 - 86	D	=	63 - 66
B-	=	80 - 82	D-	=	60 - 62
C+	=	77 - 79	F	=	<60

Assignment and examinations overview:
Exams:
There will be two preliminary exams and a final exam of 50 minutes each, covering the material previously presented. Exam questions will be composed of multiple choice, true-false questions, and short and long answers. Papers used for discussion during the class and for reading assignments may be part of the exams.

Reading/Discussion
Some lecture time will be designated for group discussions about reading assignments. Journal articles related to topics discussed in class will be provided. You will be required to read the paper, outline the methodologies employed, highlight key findings, and specify the paper's relevance to the topic.

Graduate Expectations
Graduate students must also summarize the paper (200-500 words). These papers will then serve as the basis for in-class and Brightspace discussions. During these discussions, you are expected to offer constructive feedback and effectively address queries posed by the instructor or fellow students.

Quizzes:
Quizzes will be given during class sessions without prior notice. These quizzes will cover material discussed on the current day as well as in previous classes. If you know that you will not be able to attend class, please let me know as soon as possible so we can reschedule your quiz.

Research Paper/Seminar:
The research paper will allow students to research topics related to plant breeding and genetic resources to a specific topic or crop of their interest. This assignment aims to broaden the student's comprehension of concepts and their application, as well as develop critical thinking and written and oral presentation skills.

Paper themes:

1 - Review a specific topic/application of different technologies or approaches in plant breeding, preferably (but not only) topics that were not extensively covered during the lectures. Examples of topics: breeding for organic agriculture; epigenetics; genomic selection; genome editing; participatory plant breeding; breeding for nutritional enhancement; conservation of genetic resources of a specific crop; transgenic crops; etc.

or

2 - Present a breeding program for a specific crop and goal; providing the overall scheme and plans for the breeding program: importance of the crop, choice of the breeding goal, germplasm acquisition, breeding strategy (from initial crosses to cultivar release), biotechnology applied in the program, etc.

Before February 21st, 2025, each student is anticipated to choose a theme for their paper, subject to Mario's approval.

Part 1. The paper outline is due on March 1st. It must have the title, introduction/rationale, and objectives. It should include the importance of the chosen topic and how it applies to plant breeding. Maximum 2 pages, double-spaced, font size of 12. This will be peer-reviewed by 2 students and Mario.

Part 2. The draft paper is due on April 1st. It should include the sections in Part 1, coupled with methods/techniques (if breeding program project) or the review of the chosen topic, final considerations, and conclusions. Maximum 8-10 pages, double-spaced, font size of 12. This will be peer-reviewed by 2 students and Mario.

Part 3. The final paper is due on April 17th. Including all the sections, plus any changes made based on the peer revisions. The paper should span at least 8 to 10 pages (excluding references), double-spacing, and a font size of 12. References employed within the document must originate primarily from peer-reviewed journal articles and books, with a minimum of 8 references. These references should be diligently compiled at the end of the paper, providing comprehensive documentation of the sources consulted, and it should follow the APA style. Before the final version, all submitted versions should be submitted as a Word file, allowing peer revision to use track changes and include suggestions. The final version is encouraged to be submitted in PDF format.

Every student will provide an oral presentation about their paper, lasting a maximum of 15 minutes, with a minimum duration of 10 minutes. You are encouraged to use your preferred presentation method, such as single slide, multiple slides, videos, pictures, maps, etc.

Turn in all written work on time: late work will be penalized by 10% of the total possible grade for each day late unless permission for an extension has been granted in advance. Students are allowed to use generative AI to assist with outlines, proofread, and edit assignments to check grammar, syntax, clarity, and consistency.

Grade breakdown:

Undergraduate Students

Quizzes	15%
Reading assignments	15 %
Breeding special topic paper - Paper 20% - Presentation 10%	30%
Exam 1	10%
Exam 2	10%
Exam 3	20%
Total	**100%**

Graduate Students

Quizzes	10%
Reading assignments	10%
Paper summary	10%

Breeding special topic paper - Paper 20% - Presentation 10%	30%
Exam 1	10%
Exam 2	10%
Exam 3	20%
Total	**100%**

Class community: Learning in community is a powerful experience and one of the best things about learning in a university setting. In this class, an open and inclusive learning environment is fostered, and I welcome and respect diverse perspectives and opinions and strive to communicate clearly and kindly with one another. All questions are encouraged and respected, and no judgments will be made based on the inquiries you raise. Feel free to participate, inquire, and engage without hesitation, as your curiosity and contributions are valued and essential to our collective learning experience.

Course infrastructure and access: All course readings, assignments, and grading rubrics will be available on Brightspace. All assignments should be submitted using Brightspace. If you have not been granted access to our class Brightspace site, please contact the instructor right away.

Hardware, software, and bandwidth requirements: To complete this course, you will need access to a computer and the following software: An internet browser (Mozilla Firefox works best with Brightspace), word processing (MS Word or Google Docs preferred), and presentation (Power Point, Prezi, Canva).

Time management: One of the most important skills you will gain through this course (and your time at the University of Maine in general) is time management. Time is valuable, and effective time management can help you reduce your stress level, improve your decision making, and be successful. You will showcase your time management skills in this course by submitting assignments on time, arriving at class meetings before the lecture begins, and allowing yourself enough time to complete outside assignments thoroughly. Please contact me or come to office hours if you need guidance on how to better manage your time and meet course requirements.

Campus Policies

Academic Honesty Statement:

Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, or generated by software or systems without the explicit approval of the instructor, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire

course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.

Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314.

Students Accessibility Services Statement

If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 139 Rangeley Rd, um.sas@maine.edu, 581.2319, as early as possible in the term. Students may begin the accommodation process by submitting an accommodation request form online and uploading documentation. Once students meet with SAS and eligibility has been determined, students submit an online request with SAS each semester to activate their approved accommodations. SAS creates an accessibility letter each semester which informs faculty of potential course access and approved reasonable accommodations; the letter is sent directly to the course instructor. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with Mario privately as soon as possible.

Course Schedule Disclaimer (Disruption Clause):

In the event of an extended disruption of normal classroom activities (due to COVID-19 or other long-term disruptions), the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Observance of Religious Holidays/Events:

The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

Sexual Violence Policy

Sexual Discrimination Reporting

The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a faculty or staff member who is deemed a "responsible employee" about sexual

discrimination, they are required to report this information to Title IX Student Services or the Office of Equal Opportunity.

Behaviors that can be "sexual discrimination" include sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct, and gender discrimination. Therefore, all of these behaviors must be reported.

Why do teachers have to report sexual discrimination?

The University can better support students in trouble if we know about what is happening. Reporting also helps us to identify patterns that might arise – for example, if more than one person reports having been assaulted or harassed by the same individual.

What will happen to a student if a teacher reports?

An employee from Title IX Student Services or the Office of Equal Opportunity will reach out to you and offer support, resources, and information. You will be invited to meet with the employee to discuss the situation and the various options available to you.

If you have requested confidentiality, the University will weigh your request that no action be taken against the institution's obligation to provide a safe, nondiscriminatory environment for all students. If the University determines that it can maintain confidentiality, you must understand that the institution's ability to meaningfully investigate the incident and pursue disciplinary action, if warranted, may be limited. There are times when the University may not be able to honor a request for confidentiality because doing so would pose a risk to its ability to provide a safe, nondiscriminatory environment for everyone. If the University determines that it cannot maintain confidentiality, the University will advise you, prior to starting an investigation and, to the extent possible, will share information only with those responsible for handling the institution's response

The University is committed to the well-being of all students and will take steps to protect all involved from retaliation or harm.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For *confidential resources on campus*: **Counseling Center: 207-581-1392** or **Northern Light Primary Care, University of Maine: at 207-581-4000**. *Confidential Resource Advisor: 207-571-5372 (call or text). Or see the Confidential Resource Advisor website for a complete list of services and resources (open in a new window).*

For *confidential resources off campus*: **Rape Response Services:** 1-800-871-7741 or **Partners for Peace**: 1-800-863-9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For *support services on campus*: **Title IX Student Services: 207-581-1406**, **Office of Community Standards: 207-581-1406**, **University of Maine Police: 207-581-4040 or 911**.

Visit the Title IX Student Services website at umaine.edu/titleix/ for more information.

Policy on children in class: Currently, the University does not have a formal policy on children in the classroom. The policy described here is a reflection of my own beliefs and commitments to student, staff, and faculty parents.

(1) All exclusively breastfeeding babies are welcome in classes as often as necessary;
(2) For older children and babies, we understand that unforeseen disruptions in childcare might require a parent to bring a child into the classroom. We trust you will do your best to have the child engaged in a quiet activity so as to not disrupt the classroom environment;
(3) We ask that students work with us to create a welcoming environment that is respectful of all forms of diversity, including diversity in parenting status;
(4) In cases where babies and children have urgent needs during class discussion periods, we ask that you attend to your child in a manner that doesn't disrupt the learning of other students, and that you rejoin the conversation as soon as your child's needs are met;
(5) Finally, we understand that often the largest barrier to completing your coursework once you become a parent is the tiredness many parents feel in the evening once children have finally gone to sleep. While we maintain the same high expectations for all students in our classes regardless of parenting status, we are happy to problem solve with you in a way that makes you feel supported enough to strive for school-parenting balance.

Tentative Course Schedule and Topics

Week	*Topic*	*Reading/Chapter*
1	General overview; syllabus	**Sleper & Poehlman: chapter 1**
	Plant breeding definition and contributions; key plant breeders and their milestones.	
2	Plant domestication and centers of origin; Genetic resources; pre-breeding	**Sleper & Poehlman: chapter 13**
	Paper discussion 1	
3	Mendel's laws of inheritance (revision of concepts, independent segregation, dominance, epistasis, genetic linkage)	**Sleper & Poehlman: chapter 3**
4	Reproduction in plants (sexual, asexual, types of flowers, apomixis, pollination and fertilization)	**Sleper & Poehlman: chapter 2**
	Variation on chromosome number: polyploids	**Sleper & Poehlman: chapter 5**
5	Genetic variability; mutation	**Sleper & Poehlman: chapter 6**
	Qualitative and quantitative traits; measurement; gene action	**Sleper & Poehlman: chapter 4**
	Heritability and selection gain. **Paper theme due – Feb 21**	**Sleper & Poehlman: chapter 4**
6	Phenotyping; GxE	**Sleper & Poehlman: chapter 4**
	Exam 1	

7	Breeding self-pollinated crops	**Sleper & Poehlman: chapter 9**
	Breeding self-pollinated crops. **Paper outline due – March 1**	**Sleper & Poehlman: chapter 9**
8	Breeding open-pollinated crops	**Sleper & Poehlman: chapter 9**
	Breeding open-pollinated crops	**Sleper & Poehlman: chapter 9**
	Paper discussion 2;	
9	No class - Spring break	-
10	Breeding clonally propagated crops	**Sleper & Poehlman: chapter 11**
	Breeding hybrids	**Sleper & Poehlman: chapter 11**
11	**Exam 2**	
	Molecular Techniques in Plant Breeding: molecular markers.	**Sleper & Poehlman: chapter 8.** **Bernardo: chapter 7**
12	Genomic selection, genome-wide association studies (GWAS). **Paper draft due – April 1**	**Sleper & Poehlman: chapter 8**
	Paper discussion 3	
13	Breeding for abiotic stress	
	Breeding for biotic stress	
	Paper discussion 4	

14	Practical class: potato crossing;	**Clapp greenhouse**
	Student Presentation. **Final paper due – April 17**	
15	Student Presentation	
	Exam 3	

SFR - 506 - Applied Remote Sensing for Forestry

Graduate New Course Proposal Form - 2023/24 AY

General Catalog Information

Graduate New Course Proposal Form

Read before you begin

FILL IN all fields required marked with an *.

ATTACH supporting documentation.

LAUNCH proposal by clicking Validate and Launch at the top. Once the proposal has been launched, approve the proposal to move the proposal forward in the workflow.

Requested Action: ***Note*: A complete syllabus is required for all new courses.**

Please be sure that all elements required for a syllabus at the University of Maine are present. We recommend you work closely with the syllabus guidelines found at www.umaine.edu/citl.

For assistance in completing this form or if you have any questions, email um.catalog@maine.edu.

Please attach any required files by navigating to the right side menu and clicking “Files”.

Graduate course proposals, modifications, or eliminations must be submitted to the Graduate School no later than the 3rd of each month. Please refer to the Graduate School website for the Curriculum Committee meetings schedule as well as instructions on completing this form. [https://umaine.edu/graduate/facultystaff-resources/curriculum-committee/]

Syllabus* ☑ Attached

REASON FOR NEW COURSE* Graduate version of SFR406 is needed and this is our suggestion.

Department* School of Forest Resources

New Course: * ☑ New Course ☐ Experimental

EFFECTIVE SEMESTER:

Semester* Fall

Year* 2025

PROPOSED CATALOG DESCRIPTION:

Course Designator* SFR

Proposed Course #* 506

Course Type: * Forest Resources

Short Course Title (The short course title will reflect on the Class Section in MaineStreet and on the student's transcript. Max Length is 30 characters). * Applied Remote Sensing

Long Course Title* Applied Remote Sensing for Forestry

Course Description:* This course is designed for graduate students looking to build a comprehensive understanding of both the historical developments and the latest advancements with the use of remote sensing technology and methods in forestry and natural resources. Students will explore a wide range of topics, including sophisticated digital image interpretation and photogrammetry, advanced satellite image processing and computation, and state-of-the-art approaches to LiDAR-based forest inventory and analysis. Students will develop proficiency in working with high-resolution digital imagery and other geospatial data, employing advanced GIS and image processing software and customized programming code. Finally, each student will work on a semester-long project that provides the opportunity to synthesize their newly acquired knowledge and expanded skills in remote sensing to address a real-world forestry application. SFR 406 and SFR 506 cannot both be taken for degree credit.

Prerequisites: SFR 400 or permission

Corequisites: None

Definition of Credit Hours: Go to https://umaine.edu/graduate/students/progress/enroll/#define-credit-hour for the definition of a credit hour at UMaine.

Credit Hours: * 3

Can this course be repeated for credit? * ○ Yes ◉ No

If YES, total number of credits allowed:

If YES, total number of completions allowed:

Can students enroll multiple times in term? * ○ Yes ◉ No

Instruction Mode: Select the mode of instruction for this course. Review the instruction modes documentation provided by UMS. https://gojira.its.maine.edu/confluence/display/DARTS/Instruction+Modes+Documentation. *

☐ Distance Synchronous Learning ☐ Hybrid/Blended ☐ Hyflex ☑ In-Person
☐ Online (Asynchronous)

(For information on Course Components Definitions please see: UMS Data Governance Course Components Definitions)

Course Components (type of course/used by Student Records for MaineStreet) *

☐ Applied Music ☐ Clinical ☐ Field Experience ☐ Independent Study
☑ Laboratory ☑ Lecture ☐ Recitation ☐ Research ☐ Seminar
☐ Simulation ☐ Studio ☐ Thesis ☐ Travel Course

When will this course typically be offered * ☑ Fall ☐ Summer ☐ Spring ☐ Alternating ☐ Variable

Text(s) Planned for Use* None

Course Instructor* Dan Hayes

Will instructional cost for this course proposal involve financial support from the Division of Life Long learning?* ☐ Yes ☑ No

Proposed Resources: Does the course addition or modification require additional department or institutional facilities, support and/or resources, e.g. new lab facilities, computer support and services, staffing (including graduate teaching assistants), or library subscriptions and

☑ No. The academic unit will not request additional resources for the course ☐ Yes

subscriptions and resources?*	
Units Affected: What other academic units are affected (e.g. course overlap, prerequisites)? Have the affected units been consulted? Any concerns expressed? Please explain.*	SFR
Course Frequency: Does the content of this course overlap significantly with other University courses? If so, list the course, explain the overlap, and justify the need for the proposed course.*	Yes with SFR406. SFR506 will cover more advanced material for graduate students and to accomodate larger enrollments than computer labs can handle.

University of Maine, School of Forest Resources (SFR)

SFR 506 | Applied Remote Sensing for Forestry

Fall Term, 2025

Course Description: This course is designed for graduate students looking to build a comprehensive understanding of both the historical developments and the latest advancements with the use of remote sensing technology and methods in forestry and natural resources. Students will explore a wide range of topics, including sophisticated digital image interpretation and photogrammetry, advanced satellite image processing and computation, and state-of-the-art approaches to LiDAR-based forest inventory and analysis. Students will develop proficiency in working with high-resolution digital imagery and other geospatial data, employing advanced GIS and image processing software and customized programming code. Finally, each student will work on a semester-long project that provides the opportunity to synthesize their newly acquired knowledge and expanded skills in remote sensing to address a real-world forestry application. SFR 406 and SFR 506 cannot both be taken for degree credit. **Prerequisites:** SFR 400 or GIS equivalent. **Course Offered:** Annually, Fall Term. **Mode of Instruction:** In-person, one 2-hour hands-on demonstration exercise session plus one 2-hour laboratory work session per week. **Credits:** 3.

Instructor: Daniel Hayes, **daniel.j.hayes@maine.edu**, Associate Professor in the School of Forest Resources and Director of the Wheatland Geospatial Lab, Nutting Hall Room 260A (office hours open door or by appointment).

Course Organization: Course announcements, content, data sets, assignments, and assessments will be managed through *Brightspace*, the learning management system used by UMaine. Students will find pre-class content on this semester's SFR 506 course page, including pre-recorded lecture videos to be watched before the first class time of each week. Excepting outside activities and where otherwise noted, class will meet at the GIS computer lab in Room 235/245 Nutting Hall.

Course Goals & Objectives: The primary goal is to provide students with advanced knowledge of how to acquire, handle, interpret, and derive measurements and forest type and change information using state-of-the-art remote sensing technology. A major objective is for students to acquire expertise and practical skills in the methods for mapping forest resources that can be applied in their graduate research projects and future professions.

Learning Objectives. Upon completion of the course, students will be expected to:

1. Apply the theory and methods of photographic and non-photographic remote sensing to tree, stand and forest landscape measurement, mapping, and monitoring.
2. Apply the spectral reflectance properties of surface for quantitative analysis of forest structural attributes, health, and productivity.
3. Discuss the tradeoffs among different types of remote sensing systems, their resolution, availability, and suitability for various forest and landscape mapping, monitoring, and management applications.
4. Use ground-based data to calibrate and evaluate advanced models that use remote sensing data to estimate forest inventory attributes.

5. Utilize raster imagery and three-dimensional point cloud data and processing for spatial analysis of forest landscapes.
6. Communicate effectively in scientific and professional writing.

Attendance: All sessions should be attended because information presented will supplement the readings, videos, and other content available outside of class that will be essential for completing the in-class hands-on exercises and assignments. Attendance is **required** for all demonstration exercise sessions. Only students with excused absences will be allowed to make up a session.

Academic Honesty Statement: Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, or generated by software or systems without the explicit approval of the instructor, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314 (*Date Issued: September 1, 2020): https://www.maine.edu/board-of-trustees/policy-manual/section-314/

Students Accessibility Services: If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, located at the Center for Accessibility and Volunteer Engagement at the UCU, 139 Rangeley Rd, um.sas@maine.edu, 207.581.2319, as early as possible in the term. Students may begin the accommodation process by submitting an accommodation request form online and uploading documentation at https://umaine-accommodate.symplicity.com/public_accommodation/. Once students meet with SAS and eligibility has been determined, students submit an online request with SAS each semester to activate their approved accommodations. SAS creates an accessibility letter each semester which informs faculty of potential course access and approved reasonable accommodations; the letter is sent directly to the course instructor. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me (Dan Hayes) privately as soon as possible.

Observance of Religious Holidays/Events: The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to

observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

Sexual Discrimination Reporting: The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination involving members of the campus, your teacher is required to report this information to Title IX Student Services or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For *confidential resources on campus*: **Counseling Center: 207-581-1392** or **Northern Light Primary Care, University of Maine: at 207-581-4000**. *Confidential Resource Advisor: 207-571-5372 (call or text). Or see the Confidential Resource Advisor website for a complete list of services and resources (open in a new window).*

For *confidential resources off campus*: **Rape Response Services:** 1-800-871-7741 or **Partners for Peace**: 1-800-863-9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For *support services on campus*: **Title IX Student Services: 207-581-1406**, **Office of Community Standards: 207-581-1409**, **University of Maine Police: 207-581-4040 or 911**. Or see the Title IX Student Services website for a complete list of services (open in a new window) . Also, Student Wellness Resource Center (opens in a new window).

Item	Qty.	Pts. / Ea.	Tl. Pts.	Pct.
Participation	15	5	75	15%
Study Guides	7	25	175	35%
Lab Reports	4	30	120	24%
Term Project Abstract	1	30	30	6%
Term Project Poster	1	100	100	20%
Total			**500**	**100%**

Grading Scale: A. 90 – 100%; B. 80 – 89%; C. 70 – 79%; D. 60 – 69%; F. 0 – 59%

Course Schedule Disclaimer (Disruption Clause): In the event of an extended disruption of normal classroom activities (due to COVID-19 or other long-term disruptions), the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

SFR 506 COURSE SCHEDULE OF TOPICS, Fall Term 2025:

	Date	Topic	Demo Exercise	Lab Exercise	Assignment	Due
	9/1	Introductions	**LABOR DAY (No Class)**		Intro videos & pre-assessment	9/9
1	9/8	Scale	Air Photos	Determine Map & Photo Scale	SG 1: Learn about Map & Photo Scale	9/16
2	9/15	Aerial Imagery	Image Search & Download	Plan a Flight Acquisition	SG 2: Learn about Color	9/23
3	9/22	Reflectance	Photo Interpretation	Interpret Stand Types	SG 3: Learn about Imagery	9/30
4	9/29	Photogrammetry	3-D Trees	Analyze UAS Canopy Imagery	SG 4: Learn about Drones	10/7
5	10/6	Unoccupied Aerial Systems	UAS Image Acquisition	Measure UAS Image Point Clouds	SG 5: Learn about Lidar	10/21
	10/13	**FALL BREAK (No Class)**				
6	10/20	Intro to Lidar	Lidar Individual Tree Methods	Measure Trees from Lidar	SG 6: Learn about EFI Applications	10/28
7	10/27	Lidar Enhanced Forest Inventory	Lidar Area-based Models	Map & Analyze EFI Variables	LR 1: Lidar EFI	11/4
8	11/3	Earth Observation Systems	Image Search & Download	Analyze Multiband Imagery	SG 7: Learn About Landsat	11/12
	11/10	Applications	**VETERAN'S DAY (No Class)**		Project Abstract	11/18
9	11/17	Digital Image Processing	Image Processing Workflow	Map Your Study Area	LR 2: Image Analysis	11/25
10	11/24	Land Cover / Land Use Classification	Create Training & Reference Data	Classify & Validate Forest Land Cover	LR 3: Classification & Accuracy	12/2
11	12/1	Disturbance Processes	Change Detection Methods	Map & Analyze Change	LR 4: Multi-date Change Mapping	12/9
12	12/8	Presenting Research	Work on your project		Draft Poster	12/16
	12/15	**Poster Session (TBA)**			Final Poster Submission	12/20

ERS - 527 - Isotope Geology

Graduate Course Modification Form - 2024/25 AY

General Catalog Information

Graduate Course Modification Form

Read before you begin

FILL IN all fields required marked with an * after importing data.

ATTACH supporting documentation.

LAUNCH proposal by clicking Validate and Launch at the top. Once the proposal has been launched, approve the proposal to move the proposal forward in the workflow.

For assistance in completing this form or if you have any questions, email um.catalog@maine.edu.

*Faculty who are converting a course for online delivery, or making substantive changes to an existing course delivered online, are strongly encouraged to work with the Center for Innovation in Teaching and Learning (CITL) on those modifications: https://umaine.edu/citl/instructional-design-2/

Graduate course proposals, modifications, or eliminations must be submitted to the Graduate School no later than the **3rd of each month.** Please refer to the Graduate School website for the Curriculum Committee meetings schedule as well as instructions on completing this form. [https://umaine.edu/graduate/facultystaff-resources/curriculum-committee/]

REASON FOR COURSE MODIFICATION:* Slight name change to be more consistent with course content, and for consistency with similar courses taught at other universities.

MODIFICATION:*

- [ ] Designator Change
- [ ] Credit Change
- [ ] Cross Listing
- [ ] Number Change
- [x] Title Change
- [ ] Description Change
- [ ] Prerequisite Change
- [ ] Addition of Electronic Learning Component*
- [ ] Conversion of an existing on-site Course to an online Course*

Department* School of Earth and Climate Change

EFFECTIVE SEMESTER:

EFFECTIVE SEMESTER:

Semester* Spring

Year* 2025

CATALOG DESCRIPTION:

Current Course Designator* ERS

Current Course #* 527

Proposed Course Designator

Proposed Course #

If the Course will be cross listed, please identify below what the current Undergraduate or Gradute Course Number is and what the proposed Graduate Cross Listing Course Number will be.

Current Undergraduate or Graduate Course Number

Proposed Graduate Cross Listing Course Number

Current Short Course Title (The short course title will reflect on the Class Section in MaineStreet and on the student's transcript. Max 30 characters).* Isotope Geology

Proposed New Short Course Title (The short course title will reflect on the Class Section in MaineStreet and on the student's transcript. Max 30 characters) Isotope Geochemistry

Current Long Course Title* Isotope Geology

Proposed Long Course Title Isotope Geochemistry

Current Course Description* Theory of variations in the relative abundances of naturally occurring radioactive and stable isotopes. Applications will emphasize the use of isotopic tracers in studies of petrogenesis,

geochronology, paleoceanography and paleoecology.

Proposed Course Description

Current Prerequisite(s)

Proposed Prerequisite(s)

Current Corequisite(s)

Proposed Corequisite(s)

Definition of Credit Hours: Go to https://umaine.edu/graduate/students/progress/enroll/#define-credit-hour for the definition of a credit hour at UMaine.

Current Credit Hours:* 3

Proposed Credit Change

If the course designator or course number is being changed, please list any courses for which this course is a prerequisite:

When will this course typically be offered ☐ Fall ☐ Summer ☐ Spring ☐ Alternating ☐ Variable

Can this course be repeated for credit? ○ Yes ○ No

If YES, total number of credits allowed:

If YES, total number of completions allowed:

Can students enroll multiple times in term? ○ Yes ◉ No

Instruction Mode: Select the mode of instruction for this course. Review the instruction modes documentation provided by UMS. https://gojira.its.maine.edu/confluence/display/DARTS/Instruction+Modes+Documentation.

☐ Distance Synchronous Learning ☐ Hybrid/Blended ☐ Hyflex ☐ In-Person
☐ Online (Asynchronous)

COURSE RESOURCES

Does this course addition require additional department or institutional facilities, support and/or resources, or library subscriptions and resources?

- ( ) Yes
- ( ) No

If additional resources are needed, outline them below:

Will instructional cost for this course proposal involve financial support from the Division of Life Long learning?*

- [ ] Yes
- [x] No

NUR - 506 - Professional Issues in Advanced Practice Nursing

Graduate Course Modification Form - 2024/25 AY

General Catalog Information

Graduate Course Modification Form

Read before you begin

FILL IN all fields required marked with an * after importing data.

ATTACH supporting documentation.

LAUNCH proposal by clicking Validate and Launch at the top. Once the proposal has been launched, approve the proposal to move the proposal forward in the workflow.

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REASON FOR COURSE MODIFICATION:* Course format changing from in-person to hybrid due to components of course content being offered in person and online. Dates of in-person components are scheduled.

MODIFICATION:*
- [ ] Designator Change
- [ ] Credit Change
- [ ] Cross Listing
- [ ] Number Change
- [ ] Title Change
- [ ] Description Change
- [ ] Prerequisite Change
- [ ] Addition of Electronic Learning Component*
- [x] Conversion of an existing on-site Course to an online Course*

Department* School of Nursing

EFFECTIVE SEMESTER:

EFFECTIVE SEMESTER:

Semester* Spring

Year* 2025

CATALOG DESCRIPTION:

Current Course Designator* NUR

Current Course #* 506

Proposed Course Designator N/A

Proposed Course # N/A

If the Course will be cross listed, please identify below what the current Undergraduate or Gradute Course Number is and what the proposed Graduate Cross Listing Course Number will be.

Current Undergraduate or Graduate Course Number N/A

Proposed Graduate Cross Listing Course Number N/A

Current Short Course Title (The short course title will reflect on the Class Section in MaineStreet and on the student's transcript. Max 30 characters).* Professional Issues

Proposed New Short Course Title (The short course title will reflect on the Class Section in MaineStreet and on the student's transcript. Max 30 characters) N/A

Current Long Course Title* Professional Issues in Advanced Practice Nursing

Proposed Long Course Title N/A

Current Course Description*	This course addresses key professional issues in advanced practice nursing, tailored specifically for future family nurse practitioners (FNPs). Students will explore the integration of their education and clinical experiences with a focus on preparing for FNP board certification, fine-tuning resumes and interview skills, understanding FNP salaries, contracts, and mastering the art and science of negotiation. Emphasis is placed on articulating the value of FNPs in U.S. primary care settings, navigating reimbursement, preventing malpractice, and ethical decision-making. Students will redefine their role in managing late-stage Alzheimer's disease, master the home visit, and address imposter syndrome, empowering them to take bold, informed steps as they transition to professional practice. The course fosters a supportive infrastructure for FNPs to succeed in their roles.
Proposed Course Description	N/A
Current Prerequisite(s)	
Proposed Prerequisite(s)	
Current Corequisite(s)	
Proposed Corequisite(s)	

Definition of Credit Hours: Go to https://umaine.edu/graduate/students/progress/enroll/#define-credit-hour for the definition of a credit hour at UMaine.

Current Credit Hours:*	2
Proposed Credit Change	N/A
If the course designator or course number is being changed, please list any courses for which this course is a prerequisite:	
When will this course typically be offered	☐ Fall ☐ Summer ☑ Spring ☐ Alternating ☐ Variable
Can this course be repeated for credit?	○ Yes ◉ No
If YES, total number of	**If YES, total number of**

If YES, total number of credits allowed:

If YES, total number of completions allowed:

Can students enroll multiple times in term?
- ( ) Yes
- (•) No

Instruction Mode: Select the mode of instruction for this course. Review the instruction modes documentation provided by UMS. https://gojira.its.maine.edu/confluence/display/DARTS/Instruction+Modes+Documentation.
- [ ] Distance Synchronous Learning
- [x] Hybrid/Blended
- [ ] Hyflex
- [ ] In-Person
- [ ] Online (Asynchronous)

COURSE RESOURCES

Does this course addition require additional department or institutional facilities, support and/or resources, or library subscriptions and resources?
- ( ) Yes
- (•) No

If additional resources are needed, outline them below:

Will instructional cost for this course proposal involve financial support from the Division of Life Long learning?*
- [x] Yes
- [ ] No

SFR - 695 - Graduate Seminar in Wood Science

Graduate Course Modification Form - 2024/25 AY

General Catalog Information

Graduate Course Modification Form

Read before you begin

FILL IN all fields required marked with an * after importing data.

ATTACH supporting documentation.

LAUNCH proposal by clicking Validate and Launch at the top. Once the proposal has been launched, approve the proposal to move the proposal forward in the workflow.

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*Faculty who are converting a course for online delivery, or making substantive changes to an existing course delivered online, are strongly encouraged to work with the Center for Innovation in Teaching and Learning (CITL) on those modifications: https://umaine.edu/citl/instructional-design-2/

Graduate course proposals, modifications, or eliminations must be submitted to the Graduate School no later than the **3rd of each month.** Please refer to the Graduate School website for the Curriculum Committee meetings schedule as well as instructions on completing this form. [https://umaine.edu/graduate/facultystaff-resources/curriculum-committee/]

REASON FOR COURSE MODIFICATION:* The SFR-695 course titled Graduate Seminar in Wood Science has been traditionally offered for former Wood Science (currently Bioproducts Engineering) graduate students. By way of this proposal, we are expanding this course to include other graduate students (forest science, human dimensions) as well. There are changes in the title and well as slight changes in the syllabus.

MODIFICATION:*
- ☐ Designator Change
- ☐ Credit Change
- ☐ Cross Listing
- ☐ Number Change
- ☑ Title Change
- ☑ Description Change
- ☐ Prerequisite Change
- ☐ Addition of Electronic Learning Component*
- ☐ Conversion of an existing on-site Course to an online Course*

Department* School of Forest Resources

EFFECTIVE SEMESTER:

Semester* Fall

Year* 2025

CATALOG DESCRIPTION:

Current Course Designator* SFR

Current Course #* 695

Proposed Course Designator SFR

Proposed Course # 695

If the Course will be cross listed, please identify below what the current Undergraduate or Gradute Course Number is and what the proposed Graduate Cross Listing Course Number will be.

Current Undergraduate or Graduate Course Number

Proposed Graduate Cross Listing Course Number

Current Short Course Title (The short course title will reflect on the Class Section in MaineStreet and on the student's transcript. Max 30 characters).* Seminar in Wood Science

Proposed New Short Course Title (The short course title will reflect on the Class Section in MaineStreet and on the student's transcript. Max 30 characters) Seminar in Forest Resources

Current Long Course Title* Graduate Seminar in Wood Science

Proposed Long Course Title Graduate Seminar in Forest Resources

Current Course Description*	Reports and discussion of recent developments in wood science and related fields based on the literature or on current laboratory studies. Required in the program of study for wood science graduate students. Course must be taken once by M.S. students and twice by doctoral students.
Proposed Course Description	Reports and discussion of recent developments in forest resources and related fields based on the literature, reserach in the field or on current laboratory studies. Required in the program of study for all SFR graduate students. Course must be taken once by M.S. students and twice by doctoral students.
Current Prerequisite(s)	N/A
Proposed Prerequisite(s)	N/A
Current Corequisite(s)	N/A
Proposed Corequisite(s)	N/A

Definition of Credit Hours: Go to https://umaine.edu/graduate/students/progress/enroll/#define-credit-hour for the definition of a credit hour at UMaine.

Current Credit Hours:*	1
Proposed Credit Change	N/A
If the course designator or course number is being changed, please list any courses for which this course is a prerequisite:	
When will this course typically be offered	☐ Fall ☐ Summer ☑ Spring ☐ Alternating ☐ Variable
Can this course be repeated for credit?	◉ Yes ○ No
If YES, total number of credits allowed:	2
If YES, total number of completions allowed:	2
***Can students enroll**	○ Yes ◉ No

multiple times in term?*

Instruction Mode: Select the mode of instruction for this course. Review the instruction modes documentation provided by UMS. https://gojira.its.maine.edu/confluence/display/DARTS/Instruction+Modes+Documentation.

- [ ] Distance Synchronous Learning
- [ ] Hybrid/Blended
- [ ] Hyflex
- [x] In-Person
- [ ] Online (Asynchronous)

COURSE RESOURCES

Does this course addition require additional department or institutional facilities, support and/or resources, or library subscriptions and resources?

- ( ) Yes
- (•) No

If additional resources are needed, outline them below:

Will instructional cost for this course proposal involve financial support from the Division of Life Long learning?*

- [ ] Yes
- [x] No