

CALS Curriculum Committee Meeting

September 11, 2026

McCarty Hall D Rm. 1044/1045

1:00 p.m.

Via Zoom: <https://ufl.zoom.us/j/355458614>

Meeting ID : 355458614

Members: Z. Cheng, D. Coenen, T. Easterly, P. Inglett, T. Johns, M. Jones, M. Jordan, G. MacDonald, T. Martin, A. Mathews, H. McAuslane, G. Nunez, S. Saikumar, M. Smith, D. Vyas, H. Wan, P. Ward, A. Watson, J. Weeks (Chair), A. Wysocki

Agenda and Index for Materials

Approve Minutes of the August 21, 2026 meeting

Dr. Mathews: Update from UCC

Graduate New Course Proposals

1. EVR 6932 – Special Topics in Ecology and Environment (req. #23184)
2. ENY 6461 – Invertebrate Molecular Ecology (req. #22924)

Graduate Course Modification Proposal

3. SWS 5132 – Tropical Soil Management (req. #23141)

Graduate Course AI Designation Proposals

4. ABE 5009 – Control Methods in SmartAg Systems (req. #22680)
5. ABE 6165 – Applied Machine Vision & Deep Learning for Agricultural Systems (req. #22043)
6. FNR 6560 – Introduction to Bayesian Statistics in Life Sciences (req. #23055)
7. HOS 5330 – Postharvest Technologies for Horticultural Crops (req. #23066)

Undergraduate Course AI Designation Proposal

8. SUR 4380 – Remote Sensing (req. #22736)

Recycled Items

9. PCB 4522 – Molecular Genetics (req. #21907)

Comments from 8/21/2026:

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. A motion was made by Dr. Vyas to recycle this item back to the submitter for required edits and resubmission. The motion was approved. Add additional decimal points to the grading scale (example: A- = 90 to 92.99). Replace the F in the grading scale with an E. Since this is a co-taught course a copy of the graduate syllabus must be included with the submission. Also, include an additional document that outlines the differences between undergraduate and graduate courses. The comments from Teams are listed below:

21907	MODIFICATION: PCB4522 Molecular Genetics	Melissa Jones, Adam Watson, Tracy Johns, Ho Yi Wan, Gerardo Nunez, Macy Jordan	Tyler Square
Form Edits/Comments			Submitter Response:
Syllabus Edits/Comments	Not sure on the verbiage of the “Late Policy”. That may conflict with UF policy. I recommend including the link to UF’s policy in that paragraph. MKJ Consider including an AI policy that discusses how you use and AI as well as how you expect your students to use AI in your course. - MKJ Agree with previous comments from Macy. Could update “Recall how gene..” to “Compare mechanisms of gene regulation” . It might be more appropriate given this is a 4000-level class with an expectation of higher order thinking-AW		Submitter Response: This policy was essentially suggested to me by DSO – they told me that the burden of weighing whether or not a circumstance is extenuating should fall on them, not me, so to send the vast majority of students their way. I do address the use of AI in my syllabus, though it is not its own section. I may incorporate a discreet section pending the results of my class peer review. The learning goals for this class are ~half higher order and ~half lower order,

		which is intentional. The class does have a fair bit of recall but also beckons students to synthesize and make connections with provided info ("application") – the exams are approximately 50-50 recall-application, so the learning goals are split as such to reflect this
Other Edits/Comments	What are the repercussions if a student does NOT show their blank sheet upon completion of the exam? From experience, expect that to happen ALOT and for students to email you about it- MKJ	Submitter Response: I include reminders embedded in the exams which helps this a lot. I do field a panicked email or two after some exams, there are no repercussions as it is easy to tell that their page is blank.

10. PLP 6XXX – Applied AI in Plant Health (req. #23063)

Comments from 8/21/2026:

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. A motion was made by Dr. Easterly to recycle this item back to the submitter for required edits and resubmission. The motion was approved. The CALS Curriculum Committee Checklist is required. The link to the checklist is on the first page of the minutes under Required Documents. On the UCC form the Repeatable Credit category needs to read No. A proposed course syllabus without track changes needs to be submitted to the approval site. Please address the comments on Teams. See comments below:

23063	NEW: PLP6XXX Applied AI in Plant Health	<u>Matthew Smith, Greg Macdonald, Zhiyong Cheng, Tre Easterly, Danny Coenen, Heather McAuslane</u>
Form Edits/Comments	Missing checklist- TE I don't believe this is a repeatable credit course – HJM Good course description! HJM If the course is described as “second in a sequence with PLP6235C”, should that course be a prerequisite? Or will you just put that on the syllabus so that you are sure to get students who are prepared? HJM	

Syllabus Edits/Comments	Please check the UF course policy to be sure, but I believe we offer "hybrid" as an option but no longer offer "hy-flex". Also, if you choose to go this route, I would encourage having an explicit attendance policy in the syllabus. – TE The form course description and the syllabus course description are not the same. I would use the one that is on the form as it conforms well to the new guidelines. (HJM) Course prerequisites – rather than “though prior completion..”, I would state “...thus prior completion is highly encouraged”. To keep the syllabus ADA-accessible, I changed the font to white so that there is good contrast between the text and the heading background color. – HJM Course Grading Structure – you might call the Quizzes Pre- and Post-quizzes to align with what you have in the table HJM Use of AI in the course - “Any detected instance of simple copy-and-paste from a generative AI, without personal interpretation or critical reasoning, will be considered inadequate and will not be evaluated by the instructor”. How will you know this definitely? If not evaluated by the instructor, will that be a 0 for the assignment or a chance to redo? I would be more specific in the consequence for copy and paste of AI output. HJM Eight papers were listed as “required readings”. Will any of the assessments check the quality of reading? Some means to ensure or motivate students to read the papers will help enhance their learning. ZC • “Attendance via either method is expected”. Attendance is not a graded item; are there consequences for skipping class? -DC •
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CALS Curriculum Committee Meeting
Minutes from August 21, 2026
Submitted by James Fant

Members Present: Z. Cheng, D. Coenen, T. Easterly, P. Inglett, T. Johns, M. Jones, M. Jordan, G. MacDonald, A. Mathews, H. McAuslane, S. Saikumar, M. Smith, D. Vyas, H. Wan, A. Watson, J. Weeks

Substitutes: Bachir Kassas for P. Ward

Visitors: Zongliang (Carl) Jiang, K. Ramesh Reddy, Jose Huguet Tapia

Call to Order: The College of Agricultural and Life Sciences Curriculum Committee met in McCarty Hall D Rm. 1044/1045 on August 21, 2026. Dr. Weeks called the meeting to order at 1:00p.m.

Previous agenda items and supporting material can be found on the CALS College Committees homepage under document archives: <https://cals.ufl.edu/faculty-staff/committees/>

Approval of Minutes: A motion was made by Dr. Inglett to approve the minutes from the April 24, 2026 meeting of the CALS CC. The motion was approved.

All items approved by the committee will be forwarded to either the Graduate Curriculum Committee (GCC), Graduate Council (GC) or the University Curriculum Committee (UCC) once any changes requested are made and the submission is complete.

Links: Required Documents

- [CALS CC Checklist](#) (required for all course and certificate submissions)
- [CALS Syllabus Template](#) (download the Word document and populate it with your course content)
- [CALS Syllabus Accessibility Quick Reference Tips](#)
- [Video Walkthrough of CALS Syllabus Template](#)

Other Reference Documents

- [General Education Procedures and Application](#)
- [CALS Guidelines for Submission of Proposals for Co-Taught Courses](#)
- [UF Syllabus Policy](#)
- [UF Guidelines for Graduate Certificates](#)
- [UF Guidelines for Undergraduate and Professional Certificates](#)
- [Guide to Course Design](#)
- [CALS Course Objectives](#)
- [How to Write Course Objectives](#)

Dr. Mathews – Update from UCC:
May UCC:

1. Revision to International FRE Specialization in FRE. Approved - #22812
2. Revision to Marketing and Management International FRE Specialization in FRE. Approved - #22813
3. New course PLP 4XXX Medical Mycology – approved #22701 (now fully approved and is PLP4665)

Other Academic Info:

1. Simply Syllabus template posted on CCC TEAM and on CALS Curriculum Committee webpage. Please encourage all new submissions to use the template.
2. Quest 2: 2 courses lost Quest designation at next review by UF. FNR 2063 Conserving Nature for Whom and IDS2936 Living and Eating on Earth. Living and Eating on Earth not to be taught moving forward and never received a permanent prefix/#; Instructor/FNR deciding on whether to revise FNR2063 or not.
3. Revision to Marketing and Management International FRE Specialization in FRE. Approved - #22813
4. New course PLP 4XXX Medical Mycology – approved #22701 (now fully approved and is PLP4665)
5. CALS developing a new BS in Space Life Science. To be presented at upcoming CCC.
6. Streamlining Academic Management: No updates from UF regarding Course Dog system which would be where academic approval system would be moved to if moves forward. Remains on hold.

Upcoming CALS Events:

1. Advising workshop for Chairs, UG Coordinators and Prof Academic Advisors – August 28th 7:45-11:30.
2. Sept 9th – CALS Kick off – Union Grand Ballroom – 5:30-7pm
3. Sept 25th – CALS TailGATOR – Friday night at Horse Teaching Unit – must purchase a ticket

Graduate New Course Proposals

1. ANS 6XXX – Animal Epigenetics (req. #21839)

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. A motion was made by Dr. Jones to approve this item with edits required. The motion was approved. Please address the concerns posted on Teams. See comments below:

21839	NEW: ANS6XXX Animal Epigenetics	<u>Diwakar Vyas, Tim Martin,</u> <u>Patrick Inglett, Savith</u> <u>Saikumar, Patrick Ward,</u> <u>Heather McAuslane</u>
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Form Edits/Comments	Course description should be 50 words or less and use active verbs. Perhaps - <u>Investigates how</u> Animal Epigenetics course teaches how gene activity changes without altering the DNA sequence. <u>Covers</u>, covering basic epigenetic mechanisms and the methodologies to analyze them, as well as their roles in reproduction, development, behavior, health, and inheritance in livestock species. <u>Discusses</u>, and the application of epigenetic technologies in livestock reproduction, production, and disease research. It is designed to provide graduate students with a state-of-the-art perspective on livestock epigenetics. (HJM) • Effective term is Fall 2026 – Not possible given that classes start next week. Change to Spring 2027 (or Fall 2027, if this is meant to be a Fall-only course) (psw) • Weekly contact hours are listed as 6 for a 3-credit course, but there is no explanation why. (psw) • The description of the request provides more of a departmental history rather than an actual statement of what is being requested. This could be as simple as “Proposal for a new graduate course.” (psw) • Prerequisites: Okay to list “NA” for prerequisite courses, but might be useful to include a “statement of skills required prior to taking the course” under “Other course information” (psw)
Syllabus Edits/Comments	Exam totals do not equal 100 points – Anne After editing the form course description, make sure the syllabus has the same wording for the course description (HJM). No readings are located under the textbook, learning materials section. I do see that there is weekly paper discussion which I assume are the ones that would be assigned in a reading list. I would insert them under the learning materials heading...now I see that there is a reading list after the weekly course schedule. Move them to the learning materials section (HJM) Weekly course schedule (HJM) • Presentation – due in class (not on class) • I wouldn’t put Exam 1 and Week 7 in each week. Maybe just put it in the course schedule during the week when the exam will be administered? • Week 15 – study for exam. Is this an in-class review period? Course grading structure section – is the presentation 30% or 33.3%? It would be easier to add to 100% by having each exam worth 35% and the presentation worth 30% (HJM) So students won’t know if they are responsible for leading the discussion until they get into the classroom? Do you expect that all students will prepare a presentation on background, hypothesis etc...for each of the papers? You might instead assign a specific day to a student but add some grades for class participation so that there is an incentive to read the paper? (HJM) Add decimal places to the grading scale (at least one). 90.0 to 92.9, 93.0 to

	100, etc... Weekly Course Schedule (Savitha) It might be helpful to include the actual dates for each week, based on the academic calendar, rather than listing only the week number. The due dates are little confusing since there are no specific assignments mentioned. I'm assuming these dates are for the exams. If that's the case, it may not be necessary to list them separately since the exams are already mentioned. Including attendance policy would be helpful (Savitha) • For a 6000-level course, most of the SLOs sit at the lower level of Bloom's Taxonomy. Since roughly 1/3 of the grade is critical evaluation of primary literature, add an SLO that matches the assessment. (psw) • Syllabus lists "Exam 2 (Final Exam)" in Week 15. Since final exams can only be scheduled during the official final exam period, list this simply as "Exam 2" (psw) • Unmatched parentheses in grading structure: "Topic discussion (will be graded as follows (makes up 30% of final grade)." The open paren before "will be graded" should be removed. (psw) • Should there be a D- grade possible? (psw)
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2. EVR 6905 – Individual Work in Ecology and Environment (req. #22807)

This item was reviewed with items #3 and #4. A motion was made by Dr. Jones to approve these items as submitted. The motion was approved.

3. EVR 6910 – Supervised Research in Ecology and Environment (req. #22804)

See #2.

4. EVR 6912 – Non-thesis Project in Ecology and Environment (req. #22808)

See #2.

5. PLP 6XXXC – Applied AI in Plant Health (req. #23063)

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. A motion was made by Dr. Easterly to recycle this item back to the submitter for required edits and resubmission. The motion was approved. The CALS Curriculum Committee Checklist is required. The link to the checklist is on the first page of the minutes under Required Documents. On the UCC form the Repeatable Credit category needs to read No. A proposed course syllabus without track changes needs to be submitted to the approval site. Please address the comments on Teams. See comments below:

23063	NEW: PLP6XXX Applied AI in Plant Health	Matthew Smith, Greg Macdonald, Zhiyong Cheng, Tre Easterly, Danny Coenen,
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		Heather McAuslane
Form Edits/Comments	Missing checklist- TE I don't believe this is a repeatable credit course – HJM Good course description! HJM If the course is described as “second in a sequence with PLP6235C”, should that course be a prerequisite? Or will you just put that on the syllabus so that you are sure to get students who are prepared? HJM	
Syllabus Edits/Comments	Please check the UF course policy to be sure, but I believe we offer "hybrid" as an option but no longer offer "hy-flex". Also, if you choose to go this route, I would encourage having an explicit attendance policy in the syllabus. – TE The form course description and the syllabus course description are not the same. I would use the one that is on the form as it conforms well to the new guidelines. (HJM) Course prerequisites – rather than “though prior completion..”, I would state “...thus prior completion is highly encouraged”. To keep the syllabus ADA-accessible, I changed the font to white so that there is good contrast between the text and the heading background color. – HJM Course Grading Structure – you might call the Quizzes Pre- and Post-quizzes to align with what you have in the table HJM Use of AI in the course - “Any detected instance of simple copy-and-paste from a generative AI, without personal interpretation or critical reasoning, will be considered inadequate and will not be evaluated by the instructor”. How will you know this definitely? If not evaluated by the instructor, will that be a 0 for the assignment or a chance to redo? I would be more specific in the consequence for copy and paste of AI output. HJM Eight papers were listed as “required readings”. Will any of the assessments check the quality of reading? Some means to ensure or motivate students to read the papers will help enhance their learning. ZC • “Attendance via either method is expected”. Attendance is not a graded item; are there consequences for skipping class? -DC •	

Graduate Course Modification Proposals

6. MCB 5942L – Clinical Microbiology Lab (req. #22897)

A motion was made by Dr. Johns to recycle this item back to the submitter for required updates and resubmission. The motion was approved. An updated syllabus for the one credit course must be downloaded to the approval system. See the comments from Teams below:

22897	MODIFICATION: MCB5942L Clinical Microbiology Lab	<u>Melissa Jones, Tracy Johns,</u> <u>Ho Yi Wan, Diwakar Vyas,</u> <u>Adam Watson, Heather</u>
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		<u>McAuslane</u>
Form Edits/Comments	Seems straightforward. I assume a syllabus is not necessary for this request? However, a syllabus was added to the request to reduce credits for MCB 5945L. One should be added here for consistency. HJM	
Syllabus Edits/Comments	The syllabus states the course meets twice/week for 3 hours each time. That sounds like a 2 credit course. Rationale on form describes the bootcamp lab. I have reached out to Monika for clarification (Anne)	

7. HOS 6331 – Postharvest Biology (req. #22940)

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. A motion was made by Dr. Easterly to recycle this item back to the submitter for required edits and resubmission. The motion was approved. The course prerequisites on the UCC form must be included in the syllabus. Please address the comments provided on Teams. See the comments below:

22940	ADD AI Designation request: HOS6331 Postharvest Biology	<u>Gerardo Nunez, Tracy Johns, Matthew Smith, Diwakar Vyas, Savitha Saikumar, Heather McAuslane</u>
Form Edits/Comments	Course description in the syllabus and the form should be the same (HJM). This one is good - “Physiological, biochemical, and molecular aspects of senescence and ripening of harvested fruit, vegetative, and floral organs. Literature-based discussions of current theories and research on cellular processes relevant to the storage and quality maintenance of harvested plant organs”. Prerequisites listed on form, but not in syllabus. (TJ)	

Syllabus Edits/Comments	The student learning outcomes are measurable and good. The course learning objectives are weak and all start with “To familiarize”. You might want to change them for your students but I don’t know if they need to be changed here to add an AI designation. HJM Course Schedule – When are the presentations scheduled? Are those shown in the schedule in bold text (from last time the class was taught)? If so, you might call them presentation 1, presentation 2, etc... You should add an AI use policy. It will be very easy for students to use AI to summarize 5 journal articles, and even to give them the outline for a PowerPoint presentation. What use of AI is acceptable? What you want them to disclose when they use AI? Etc... (HJM) It is recommended that you indicate if/how grades will be rounded in the case of non-whole number averages. (TJ) Technology in the classroom - Please clearly describe the AI policy in this section (SS) From the instructions on requesting AI designation you must include at least one AI SLO. I don't see AI mentioned anywhere in the syllabus. (Anne)
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Undergraduate Course Modification Proposals

8. MCB 5945L – Clinical Experience in Microbiology (req. #22884)

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. A motion was made by Dr. Vyas to recycle this item back to the submitter for required updates and resubmission. The motion was approved. The course description is too long. The course objectives need to include learning verbs that represent the rigor of the course appropriately. Please refer to the CALS Course Objectives link on the first page of the minutes for assistance. There are too many SLOs. The grading scale needs to include decimal points (example: A- = 90-93.99). There needs to be a better description of how assignments are evaluated. What is passing vs. non-passing? A current syllabus for the 2 credit lab must be included with the submission. The comments from Teams are below:

22884	MODIFICATION: MCB5945L Clinical Experience in Microbiology	<u>Melissa Jones,</u> <u>Tracy Johns,</u> <u>Zhiyong Cheng,</u> <u>Diwakar Vyas,</u> <u>Adam Watson</u>	Leandro Teixeira
Form Edits/Comments	Looks fine. I note that the syllabus for this course was added to this UF Approvals request, but the same type of request for MCB5942L was not accompanied by a syllabus. Should a syllabus be added to the MCB5942L request? HJM The checklist is missing. ZC	Submitter Response: Dr. Oli added the syllabus to the MCB5942L modification request Checklist was added	

Syllabus Edits/Comments	Grading criteria for pass/not pass could have been specified. ZC Specific dates or timelines could be indicated for the course schedule. ZC Not in Simple Syllabus format, missing: Course Description, SLOs, Course Fees, etc. (TJ) The bullet points under Course Objectives could be used as SLOs. There are a few that are missing verbs (e.g. Quality control and administration....are students expected to apply quality controls?) -MKJ	Submitter Response: Simple syllabus was uploaded and pass/not pass criteria was added to the syllabus
Other Edits/Comments	Looks good - AW	Submitter Response:

9. PCB 4522 – Molecular Genetics (req. #21907)

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. A motion was made by Dr. Vyas to recycle this item back to the submitter for required edits and resubmission. The motion was approved. Add additional decimal points to the grading scale (example: A- = 90 to 92.99). Replace the F in the grading scale with an E. Since this is a co-taught course a copy of the graduate syllabus must be included with the submission. Also, include an additional document that outlines the differences between undergraduate and graduate courses. The comments from Teams are listed below:

21907	MODIFICATION: PCB4522 Molecular Genetics	<u>Melissa</u> Jones, Adam Watson, Tracy Johns, Ho Yi Wan, Gerardo Nunez, Macy Jordan	Tyler Square
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Form Edits/Comments		Submitter Response:
Syllabus Edits/Comments	Not sure on the verbiage of the “Late Policy”. That may conflict with UF policy. I recommend including the link to UFs policy in that paragraph. MKJ Consider including an AI policy that discusses how you use and AI as well as how you expect your students to use AI in your course. - MKJ Agree with previous comments from Macy. Could update “Recall how gene..” to “Compare mechanisms of gene regulation” . It might be more appropriate given this is a 4000-level class with an expectation of higher order thinking-AW	Submitter Response: This policy was essentially suggested to me by DSO – they told me that the burden of weighing whether or not a circumstance is extenuating should fall on them, not me, so to send the vast majority of students their way. I do address the use of AI in my syllabus, though it is not its own section. I may incorporate a discreet section pending the results of my class peer review. The learning goals for this class are ~half higher order and ~half lower order, which is intentional. The class does have a fair bit of recall but also beckons students to synthesize and make connections with provided info ("application") – the exams are approximately 50-50 recall-application, so the learning goals are split as such to reflect this

Other Edits/Comments	What are the repercussions if a student does NOT show their blank sheet upon completion of the exam? From experience, expect that to happen ALOT and for students to email you about it- MKJ	Submitter Response: I include reminders embedded in the exams which helps this a lot. I do field a panicked email or two after some exams, there are no repercussions as it is easy to tell that their page is blank.
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Minor Modification

10. Proposed Change to the Bioinformatics Undergraduate Minor (req. #22843)

A motion was made by Dr. Easterly to approve this item as submitted. The motion was approved.

Information item

11. MCB 7922 – Journal Colloquy (req. #21879)

Increase in maximum repeatable credits

The meeting was adjourned at **2:45** p.m.

Cover Sheet: Request 23184

EVR6932 - Special Topics in Ecology and Environment

Info

Process	Course New Grad
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Danny Coenen dcoenen@ufl.edu
Created	8/21/2026 11:15:50 AM
Updated	9/8/2026 8:40:37 AM
Description of request	SNRE requests creation of a special topics course code at the graduate level.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Natural Resources and Environment 60170000	Konda Reddy		8/21/2026
No document changes					
College	Pending	CALS - College of Agricultural and Life Sciences			8/21/2026
No document changes					
Graduate Curriculum Committee					
No document changes					
University Curriculum Committee Notified					
No document changes					
Statewide Course Numbering System					
No document changes					
Graduate School Notified					
No document changes					
Office of the Registrar					
No document changes					
College Notified					
No document changes					

Course|New for request 23184

Info

Request: EVR6932 - Special Topics in Ecology and Environment

Description of request: SNRE requests creation of a special topics course code at the graduate level.

Submitter: Danny Coenen dcoenen@ufl.edu

Created: 9/4/2026 11:15:57 AM

Form version: 2

Responses

Recommended Prefix EVR

Course Level 6

Course Number 932

Lab Code None

Course Title Special Topics in Ecology and Environment

Transcript Title Special Topics Ecology & Envir

Delivery Method PC - Primarily Classroom (0-49% of course content taught outside of classroom)

Effective Term Earliest Available

Effective Year Earliest Available

Rotating Topic Yes

Repeatable Credit? Yes

Multiple Offerings in a Single Semester Yes

If repeatable, # total repeatable credit allowed 12

Amount of Credit Variable

If variable, # min 1

If variable, # max 4

S/U Only? No

Contact Type Regularly Scheduled

Course Type Lecture

Weekly Contact Hours Will vary with the number of credit hours of each specific offering, but generally in a 1:1 ratio.

Course Description Explores special topics and emerging issues in ecological and environmental sciences.

Prerequisites N/A

Co-requisites N/A

Rationale for Placement in the Curriculum SNRE does not currently have a designated special topics course code at the graduate level. We request the creation of EVR6932 (or equivalent) to streamline advising and to better guide students to new SNRE-created graduate courses.

Syllabus Content Requirements All Items Included



Supervised Teaching in Ecology and Environment

EVR 6932 Class# [XXXXX] (0-3 credit hours) – [Semester and Year]

Syllabus

Course Coordinator: Dr. K. Ramesh Reddy, Director, School of Natural Resources and Environment

Email: krr@ufl.edu

Office Location: McCarty D, Room 2035

Drop-in office hours: TBA

Faculty Mentor: [Name & title]

Email: [Email]

Office Location: McCarty D, Room 20XX

Course: [Course Code & name of course student is assisting with]

Course Days/Times and Location: TBA

Course Description

University-level teaching experience in ecology or environmental science by serving as a graduate teaching assistant. Each teaching experience is unique, tailored to both the student's interest and to the instructor's needs.

Credits

Variable (0-3 credits). Appropriate number of credits will be determined in cooperation with SNRE's advising team and the faculty mentor, and will depend on the number of contact hours anticipated. No more than five credit hours of EVR6942 may count towards your graduate degree.

Prerequisites

Graduate student standing, course coordinator approval

Course Context:

This experience is intended for Interdisciplinary Ecology students considering a career in environmental education, academia, and others where university-level practice in teaching and class management is beneficial. It supports graduate students in honing their teaching skills, expanding their pedagogical and content knowledge, and navigating various teaching-related tasks. Responsibilities vary by class, modality, and faculty mentor, and may include creation and delivery of educational materials including lectures and activities, facilitating discussion groups or study sessions, responding to student questions, and supervised anonymized grading.

Graduate teaching assistant spots are limited and may not be available each semester. Interested students should inform Dr. Reddy via email for consideration. An application and interview process will follow during the semester prior to the teaching experience. Successful candidates are paired with an SNRE faculty member and assist them in teaching a section of an environmental science course, such as EVR2001 Introduction to Environmental Science, EVS1010 First Year Environmental Science, EVS3000 Environmental Science 1, EVS3500 Environmental Science 2, or EVS4021 Critical Thinking in Environmental Science.

Student Learning Outcomes

By the end of the semester, you will be able to:

- 1.) Articulate the major tenets of FERPA, the importance of upholding student privacy rights, and the importance of maintaining a safe and respectful campus.
- 2.) Navigate instructor features in Canvas and perform basic functions such as publishing content, posting announcements, adding comments, moderating discussion boards, and grading.
- 3.) Integrate guidance from your faculty mentor to effectively facilitate learning in the university classroom environment.
- 4.) Deliver an engaging learning experience.
- 5.) Self-appraise teaching performance and identify areas for continued future growth and improvement.

Textbooks and readings

There is no assigned textbook for this class. The faculty mentor will identify and assign readings depending on the unique needs of their class and tasks assigned to the student. For example:

Bain, K. (2004). *What the Best College Teachers Do*. Harvard University Press.

Svinicki, M. & McKeachie, W.J. (2014). *McKeachie's Teaching Tips* (14th ed.). Cengage Learning.

Grading

Course grading is consistent with [UF grading policies](#). There are 600 possible points in the course, to be distributed as follows:

Graded Item	Possible Points
Required Trainings (FERPA and Maintaining a Safe and Respectful Campus)	20
Attendance	
– at required class sessions	50
– at weekly meetings with faculty mentor	30
Educational Materials and Course Management Tasks	300
Grade distribution analysis (3x 33.3 pts)	100
Self-Reflection Assignment	100
Total	600

This is an S/U course. Per university policy, a grade of “S” is equivalent to a “C” or higher. So, students with point totals corresponding to a letter grade of “C” or higher (≥ 438 points/ $\geq 73.0\%$) in this course will receive a grade of “S” (Satisfactory). Thus, **the minimum number of points a student must earn to pass this course with an “S” is 438 points.**

Points Earned	Percentage	Grade to be Assigned to Student
438.0 - 500.0	73.0% - 100.0%	S
0.0 - 437.9	0.0% - 72.9%	U

To avoid losing points, you must successfully submit all assignments and complete all assigned tasks by their deadline. Missing, corrupt, or incompatible files may result in grade penalties up to a

score of zero for the assignment. You are responsible for maintaining duplicate copies of all work submitted for this course until the end of the semester.

In case of a grading dispute, you must notify your faculty mentor by email within one week of the date the grade is posted to Canvas. Please include an explanation of what aspect of your grade you disagree with. End-of-semester requests for grade bumps, assignment do-overs, extra credit, etc. will be denied.

Please do not wait until the end of the semester to discuss problems with this experience. Your wellbeing and success are important to your faculty mentor, SNRE, the College of Agricultural and Life Sciences, and the University of Florida, so please reach out to discuss any concerns as soon as they arise.

Required Trainings: Before you can start working as a teaching assistant, you must complete two required trainings: “FERPA Basics” and “Maintaining a Safe and Respectful Campus”. These self-paced online courses take approximately 2 hours and 35 minutes to complete, respectively. To earn credit for these trainings and to be added to the course Canvas shell, email copies of your certificates of completion to your faculty mentor and Dr. Reddy before the beginning of the first class.

Attendance: As a member of the instructional team, you have enhanced responsibilities to your faculty mentor and your students. You are expected to maintain professional attendance standards, i.e. arriving on time, being prepared, and not missing required class sessions and meetings with your faculty mentor. It is your responsibility to avoid scheduling conflicts to the best extent possible and inform your mentor well ahead of time if an unavoidable conflict arises.

Your attendance score consists of two components:

- 1.) Required class sessions (50 points). Your faculty mentor should inform you of their expectations for class attendance and/or other events or activities they would like you to be present for (field trips, labs, seminars, etc.) during your first meeting. For asynchronous classes, these may be substituted by review sessions or similar activities. Each unexcused absence incurs a penalty of 10 points.
- 2.) Weekly meetings with faculty mentor (30 points). By the end of the first week of the semester, coordinate with your faculty mentor to establish a regular weekly meeting time where you will discuss aspects of the course including upcoming content, your assigned tasks, pedagogy, etc. Each unexcused absence incurs a penalty of 10 points.

Absences will be excused per the University’s attendance policies. Specifically:

- in case of illness or injury, upon receipt of a doctor’s note or equivalent, or by following the procedure outlined here: <https://care.dso.ufl.edu/instructor-notifications>.
- in case of family emergencies, deaths, or other extenuating circumstances, by following the procedure outlined here: <https://care.dso.ufl.edu/instructor-notifications>.
- in case of religious holidays, by informing your faculty member prior to the first day of class via email.
- in case of military duty, jury duty, participation in academic conferences, or participation in official university or UAA events, by providing appropriate evidence ahead of time.
- in all other cases, or if you are unsure, please email your mentor as soon as feasible.

Absences are generally not excused for personal non-emergency travel and vehicle problems.

Educational Materials and Course Management Tasks: Responsibilities vary by class, modality, and faculty mentor, and may include creation and delivery of educational materials including lectures and activities, facilitating discussion groups or study sessions, responding to student questions, and supervised anonymized grading.

Grade distribution analysis: At the end of week 5, week 10, and at the end of the semester, the graduate student will analyze assignment rubrics and course gradebook to identify struggling students, unclear assignment instructions, and problematic exam questions. Findings will be communicated to faculty mentor for review and consideration of changes.

Self-Reflection Assignment: Near the end of the semester, you will reflect on your teaching assistant experience, what you learned from it, and how you can/will apply what you learned to your future teaching endeavors. You should incorporate specific examples from your teaching experience. The reflection may take the form of a paper, a video, an oral presentation, or other format as determined by your faculty mentor.

University of Florida Academic Policies

Please visit <https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/> for the latest academic policies.

Course Policies

Preamble

First and foremost, we want you to be successful in this experience and in your degree program. Please maintain proactive, open communication with your mentor and the graduate coordinator. **If at any point you experience extenuating circumstances that prevent you from performing to your full academic potential, please reach out for help!**

Make-up Policy and Late Work

Due to the nature of a teaching assistantship, it may not be feasible to submit work after the deadline. Accepting late work is at the discretion of your faculty mentor, and grading penalties for missing or late work should be established during your first weekly meeting.

Technical difficulties are not generally an excuse for missing an assignment; you should have contingency plans in case any such issues arise. I recommend storing your documents on a cloud service that can be accessed from any device ([OneDrive](#) is free for UF students), and having a plan for internet outages (such as identifying a source for public Wi-Fi near you or using your cell phone as a Wi-Fi hotspot). Try not to wait until the last minute to submit assignments!

Academic Honesty and Plagiarism

This course follows the university's honesty policy regarding cheating, plagiarism, etc. Many students are unaware of the seriousness of violating academic ethics. **PLAGIARISM, WHETHER INTENTIONAL OR UNINTENTIONAL, IS A SERIOUS AND POTENTIALLY CAREER-ENDING FORM OF ACADEMIC MISCONDUCT. Copying and pasting from external sources without attribution is never okay in academia.**

Artificial Intelligence (AI) Statement

Artificial Intelligence is an amazing new technology that is revolutionizing the way we access and process information, just like computers, the internet, and mobile phones did in prior decades. AI can be a useful tool to aid (but NOT replace) writers when brainstorming, spellchecking, and

editing. **However, all work submitted for credit in this course must be your own. Using AI to generate content for you, including but not limited to copying & pasting AI output in whole or part into work submitted for this class (even if you subsequently edit or paraphrase the AI output), constitutes academic dishonesty unless explicitly permitted by your faculty mentor in writing (as part of written assignment instructions or email communication).**

If you use any AI application for any part of an assignment (including brainstorming ideas or editing), you must state so as part of your submission and include the entire prompt(s) that you used with the AI tool(s) as part of your submission; **failure to do so will be considered academic dishonesty.**

Students should be cognizant that large language models (LLMs) and similar AI applications are not credible sources and should not be used as such. They are also ill-suited for finding scholarly sources.

Further, many web sites, online services, and software packages (e.g. Grammarly, Canva, many word processors) now feature AI integrations. These policies apply to these services the same way that they do for LLMs. It is your responsibility to determine if any tools you use contain AI components, and if so, disclose use of that AI. AI-generated images may not be used unless expressly approved in writing by your mentor for a specific assignment.

Paper Guidelines

All writing assignments will be submitted to Canvas and must be in **.docx** format, with the proper file extension. All assignments must include citations and references in APA 7th edition formatting. You do not need cover pages, running headers, etc.

If you experience difficulties in the writing process you are encouraged to contact your mentor for advice or visit the UF Writing Studio (see *Campus Helping Resources* below).

I strongly recommend watching the following video on academic honesty, citing sources, and proper paraphrasing by the end of the drop-add period:

<https://www.youtube.com/watch?v=g81hPRKWsdM>

Course Communication

Outside of scheduled weekly meetings with your faculty mentor, use your UF email account to contact your mentor and/or coordinator as needed. You can expect a response within 24-48 hours on weekdays in most cases.

Email

Students are required to check their email account(s) daily (at least Monday through Friday) and respond to course/program related requests, inquiries, etc. in a timely manner.

External Communication

You may use GroupMe or similar tools to communicate with other students about the class and environmental science-related topics. **You may not, however, discuss quiz and exam questions/answers with others, including quizzes and exams from prior semesters, or collaborate on any assignments intended to be worked on individually. Doing so constitutes academic dishonesty.**

Canvas Display Name Change

Canvas uses the "Display Name" as set in myUFL. The Display Name is what you want people to see in the UF Directory, such as "Ally" instead of "Allison." To update your display name, go to one.ufl.edu, click on the dropdown at the top right, and select "Directory Profile." Click "Edit" on the right of the name panel, uncheck "Use my legal name" under "Display Name," update how you wish

your name to be displayed, and click "Submit" at the bottom. This change may take up to 24 hours to appear in Canvas. This does not change your legal name for official UF records.

Technical Difficulties

For help with technical issues or difficulties with Canvas, please contact the UF Computing Help Desk at <https://helpdesk.ufl.edu>, 352-392-HELP (4357) or walk-in: HUB 132

While technical difficulties are not generally an acceptable excuse, any requests for make-ups (assignments, exams, etc.) due to technical issues should be accompanied by the ticket number received from the UF Computing Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You should email me within 24 hours of the technical difficulty if you wish to request a make-up.

Zoom Conference Privacy

Should it become necessary or convenient to hold classes virtually using zoom, those class sessions may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated. As in all courses, unauthorized sharing of recorded materials is prohibited.

Software Use

All UF faculty, staff and students are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Course Material Copyright and Confidentiality

All course material is the property of the University of Florida and the course instructor, and **may not** be posted online for any commercial or non-commercial purpose. Students found in violation may be subject to disciplinary action under the University's Student Conduct Code.

Campus Helping Resources

Your wellbeing is important to us and the University of Florida community. If you experience a crisis or personal problem that interferes with your wellbeing, please utilize the university's counseling resources. You are, of course, always welcome and encouraged to talk to your mentor, your coordinator, or advisor about any issues that interfere with your academic performance and wellbeing.

Please visit <https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/> for the latest information on academic and health & wellness resources, including the Whole Gator app.

Course Outline (subject to change)

Critical Dates

Required trainings

Grade distribution analysis 1

Grade distribution analysis 2

Self-reflection assignment

Grade distribution analysis 3

Prior to the first class session

At the end of week 5

At the end of week 10

On the last day of class

On the last day of final exam week

WEEKLY COURSE SCHEDULE

Week	Activities	Assignments Due
1	Getting Organized and Oriented - Establish a regular weekly meeting time with your faculty mentor - Learn about your mentor's expectations for class attendance and course management tasks - Complete FERPA Basics Training and Maintaining a Safe and Respectful Campus Training	FERPA Basics Certificate Maintaining a Safe and Respectful Campus Certificate
2	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
3	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
4	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
5	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned Grade distribution analysis 1
6	Course Activities as Assigned by Faculty Mentor - Weekly meeting with mentor	Educational materials and course management tasks as assigned
7	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
8	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
9	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
10	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned Grade distribution analysis 2

11	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
12	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
13	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned
14	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Educational materials and course management tasks as assigned Self-Reflection
15	Course Activities as Assigned by Faculty Mentor Weekly meeting with mentor	Grade distribution analysis 3

Course Alterations

Due to unforeseen circumstances or to enhance class learning opportunities, it may be necessary to alter the information given in this syllabus during the semester. Such changes are not unusual and should be expected. All changes to the syllabus will be announced during weekly meetings. It is your responsibility to keep up with any syllabus changes.

Acknowledgment

Parts of this syllabus are based on DIE4940 (Dr. Acosta).

Addendum

Faculty Mentor Responsibilities and Expectations

- Mentors must make themselves available for a regular weekly meeting time of at least 30 minutes, during which aspects of the course, the mentee's tasks, and pedagogy will be discussed.
- Mentors should discuss the mentee's aims for what they seek to get out of the experience and accommodate those preferences as much as feasible given the constraints of the class and its modality.
- Mentees should be kept apprised of their performance through timely, rubric-based grading of assignments and tasks (as outlined in this syllabus) and actionable feedback
- Mentors must ensure that the mentee is given student-facing responsibilities so that they can establish a meaningful presence in the course. They should be introduced as a member of the instructional team at the start of the semester. In synchronous classes, student-facing tasks should include designing and delivering multiple 50-minute lectures (including associated lesson plans), designing and implementing at least one activity, etc. In asynchronous classes, this may include designing at least one extra credit assignment, moderating discussion boards, and holding quiz or exam review sessions (with associated lesson plan and Canvas announcements).
- The mentor must keep the mentee's workload manageable and ensure that assigned tasks represent a meaningful educational experience as opposed to mere "grunt work". As a general guideline (approximating the 1:3 rule that states for each hour of class, two to three hours should be spent working on the class):
 - 1 credit hour = an average of 3-4 hours of work per week (including weekly meeting and presence in classroom, if applicable)
 - 2 credit hours = an average of 6-7 hours of work per week
 - 3 credit hours = an average of 9-10 hours of work per week
 - 0 credit hours = mutually agreed upon by the mentee, mentor, and undergraduate coordinator, not to exceed an average of 10 hours per week.

Cover Sheet: Request 22924

ENY6461 - Invertebrate Molecular Ecology

Info

Process	Course New Grad
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Andrew Mongue andrew.mongue@ufl.edu
Created	5/26/2026 3:45:20 PM
Updated	8/26/2026 10:17:06 AM
Description of request	Submitting for permanent course number for crosslisted graduate and undergraduate molecular ecology course in Entomology and Nematology Department.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Entomology and Nematology 60140000	Jennifer Weeks		8/26/2026
CALS CC Checklist molecular ecology.pdf					5/28/2026
molecular_ecology_syllabus_mongue_2027_update_undergraduate_submission_update_august25.pdf					8/25/2026
molecular_ecology_syllabus_mongue_2027_update_graduate_august25.pdf					8/25/2026
undergraduate vs graduate course differences invertebrate molecular ecology.pdf					8/25/2026
College	Pending	CALS - College of Agricultural and Life Sciences			8/26/2026
No document changes					
Graduate Curriculum Committee					
No document changes					
University Curriculum Committee Notified					
No document changes					
Statewide Course Numbering System					
No document changes					
Graduate School Notified					
No document changes					
Office of the Registrar					
No document changes					
College Notified					
No document changes					

Course|New for request 22924

Info

Request: ENY6461 - Invertebrate Molecular Ecology

Description of request: Submitting for permanent course number for crosslisted graduate and undergraduate molecular ecology course in Entomology and Nematology Department.

Submitter: Andrew Mongue andrew.mongue@ufl.edu

Created: 8/25/2026 12:16:39 PM

Form version: 2

Responses

Recommended Prefix ENY

Course Level 4/6

Co-Listing Explanation Graduate level course has extra assignments designed around generating and peer reviewing an original research proposal.

Course Number 461

Lab Code None

Course Title Invertebrate Molecular Ecology

Transcript Title Invertebrate Molecular Ecology

Delivery Method HB - Hybrid Blend (50-79% of course content taught outside of classroom)

Effective Term Spring

Effective Year 2027

Rotating Topic No

Repeatable Credit? No

Amount of Credit 3

S/U Only? No

Contact Type Regularly Scheduled

Course Type Lecture

Weekly Contact Hours 3 contact hours per week, with a shorter ~1hr lecture day on Tuesdays and longer ~2hr classes on Thursdays that feature both lecture and group work.

Course Description Addresses major topics in molecular ecology using insects as primary examples. The focus is on scientific insights provided by DNA, RNA, and proteins. Lessons cover both the technologies used to generate these data and their applications.

Prerequisites N/A for graduate students.

ENY 3005 & ENY 4161 for undergraduates.

Co-requisites N/A

Rationale for Placement in the Curriculum Bachelors/Graduate majors and minors, elective.

Syllabus Content Requirements All Items Included

CALS Curriculum Committee

Submission Checklist

Updated January 2026

NOTE: This checklist must be included with all course and certificate submissions.

The checklist below is intended to facilitate course and certificate submissions to the University of Florida Academic Approval Tracking System (<https://approval.ufl.edu/>). The checklist consists of the most common items that can cause a submission to require changes or be recycled. Contrary to information provided on the UF approval site, the CALS Curriculum Committee requires a syllabus be submitted with each new course or course modification request. Please note that submitters are encouraged to attend the CALS CC meeting at which their item is being reviewed. This allows the submitter to answer any potential questions that may arise that could cause the item to not be approved. Also, be aware that when completing the UCC form the section Description of Request is asking for a brief statement about what you are doing. This is **not** the place for a course description. A statement such as “Proposal of a new undergraduate course” is all that is needed. Please do not submit documents in pdf format. All documents should be submitted in Word to facilitate editing on our end if necessary.

CHECKLIST: PLEASE INITIAL OR MARK N/A FOR EACH STATEMENT TO INDICATE YOUR COMPLIANCE.

SYLLABUS: You are encouraged to use the CALS ACCESSIBLE SYLLABUS TEMPLATE. Accessibility will be required by APRIL 2026.

****Use of Simple Syllabus will be required for Summer 2026 forward. It is slated to be released to faculty in late February 2026.****

☒ It is required when making a submission that you consult your department’s representative to the CALS CC. A list of current members can be found on the committee site located at: <https://cals.ufl.edu/faculty-staff/committees/>.

☒ Submission of a course modification requires both the current version of the course syllabus and the proposed version.

☒ Joint course submissions must include 1) both graduate and undergraduate syllabuses and 2) a separate document outlining the substantial (more than one) differences in assignments between the two courses. These assignments must account for at least a 15% difference in graded material between the two levels. If this is a new course submission both courses must be submitted for approval simultaneously.

☒ The course description on the UCC form and in the syllabus must match and should be no longer than 500 characters. **FOR AN EXISTING COURSE, THE DESCRIPTION MUST MATCH THE CATALOG DESCRIPTION**. Follow the [COURSE DESCRIPTION GUIDELINES](#) for new courses if not contraindicated by outside certification requirements. Any other information you wish to include needs to be under a different heading such as background or additional course information.

- ✓ The course learning objectives must be consistent with Bloom's taxonomy. Please see the following link at the CALS Curriculum site. (https://cals.ufl.edu/content/PDF/Faculty_Staff/cals-courseobjectives.pdf). Do not use the words demonstrate or understand when listing learning objectives.
- ✓ The course schedule should be concise and include the appropriate number of weeks in the semester.
- ✓ All graduate course submissions must include a reading list if a textbook is not required. The reading list should include at least some current readings (within the last 5 years). All readings do not need to be current.
- ✓ Outside consultations are required if there is a possibility of the proposed course covering a significant amount of material taught in another department or college on campus. There must be a consult form completed by the chair of the department from who you are seeking the consult. Instructors may provide additional consults. The form can be found at: <https://approval.ufl.edu/policies/external-consultations/>.
- ✓ Prerequisite courses are required for 3000 and 4000 level courses. This line of the approval form cannot be "none" or left blank. Junior or senior standing is an acceptable option. A phrase such as "a course in basic biology" is not acceptable. (Graduate courses should not have specific courses listed as prerequisites. If needed a statement of skills required prior to taking the course can be provided under other course information.)
- ✓ Decimal points must be included in the grading scale if grade cut-offs are based on percentages. While this is not a university policy it is a CALS standard practice to avoid any confusion when final grades for the course are determined.
- ✓ The attendance and make-up policy in a syllabus cannot contradict the university's policy. Do not include any additional wording to this policy. A statement and link regarding this are included in the CALS Syllabus Statements. For the approval process the college suggests a less is more view when it comes to this policy.
- ✓ The most recent version of the UF Syllabus Statements. Using the accessible syllabus template will ensure you have the most up to date statements. Do not use boilerplate statements from an old syllabus as they are likely to be out of date.

Certificates

If proposing a new undergraduate or graduate level certificate that includes any courses outside of the submitters department a statement regarding any possible impact on those courses needs to be included. An email from the instructor is acceptable. Also, any courses required for the certificate must have permanent prefixes and course numbers. The submission must include intended catalog copy. (Contact Dr. Anne Mathews (anne.mathews@ufl.edu) for further instruction)

ENY6461: Invertebrate Molecular Ecology

Dr. Andrew Mongue (he/him)

Contact: andrew.mongue@ufl.edu , 352-273-3940

Student hours, 2214 Steinmetz: Tuesday 12:45 – 1:45PM or by appointment (arrange via email)

Meeting time: Tuesday 1:55 – 2:45 PM, Thursday 1:55 – 3:50 PM, in person (synchronous).

Room: Steinmetz 1027

Prerequisites: none.

Textbooks: none required, Molecular Ecology and Evolution: An Introduction recommended + provided. I am providing (with the author's permission) a digital copy of Molecular Ecology and Evolution: An Introduction by Dr. Drew Davinack. Throughout the semester as I cover topics, I will suggest reading parts as another explanation for concepts. These readings are optional and not an all-or-nothing type of resource, feel free to check out some of them as needed. If you would like to use this resource, please find the textbook pdf on Canvas. The relevant readings are marked in the calendar with the abbreviation MEE. If you want the added context, reading before class is suggested.

Readings: We will cover the following research papers in this course. These readings *are mandatory* for discussions:

- Alstad, D. N., and K. W. Corbin. "Scale insect allozyme differentiation within and between host trees." *Evolutionary Ecology* 4.1 (1990): 43-56.
- Dandan Lang, et al. Comparison of the two up-to-date sequencing technologies for genome assembly: HiFi reads of Pacific Biosciences Sequel II system and ultralong reads of Oxford Nanopore. *GigaScience*, Volume 9, Issue 12, December 2020, gaa123
- Andrés G de la Filia, et al. "Males That Silence Their Father's Genes: Genomic Imprinting of a Complete Haploid Genome." *Molecular Biology and Evolution*, Volume 38, Issue 6, June 2021
- Mongue, Andrew J., et al. "Genome report: Genome sequence of tuliptree scale, *Toumeyella liriodendri* (Gmelin), an ornamental pest insect." *G3: Genes, Genomes, Genetics* (2024).
- Tabata, Jun, et al. "A new class of mealybug pheromones: a hemiterpene ester in the sex pheromone of *Crisicoccus matsumotoi*." *Naturwissenschaften* 99 (2012).
- You, M., Ke, F., You, S. *et al.* Variation among 532 genomes unveils the origin and evolutionary history of a global insect herbivore. *Nature Comm.* **11**, 2321 (2020).
- McDonald, John H., and Martin Kreitman. "Adaptive protein evolution at the Adh locus in *Drosophila*." *Nature* 351.6328 (1991): 652-654.
- Freedman, MG, et al. Are eastern and western monarch butterflies distinct populations? A review of evidence for ecological, phenotypic, and genetic differentiation and implications for conservation. *Con. Sci.*
- Husnik, Filip, and John P. McCutcheon. "Repeated replacement of an intrabacterial symbiont in the tripartite nested mealybug symbiosis." *Proceedings of the National Academy of Sciences* 113.37 (2016): E5416-E5424.

Credits: 3

Course Description: Addresses major topics in molecular ecology using insects as primary examples. The focus is on scientific insights provided by DNA, RNA, and proteins. Lessons cover both the technologies used to generate these data and their applications.

Student Learning Outcomes: In this course you will learn to (1) **recognize major themes** and research questions in molecular ecology (2) **distinguish between types of molecular data** by how they are collected and in what contexts they are most useful (3) **analyze molecular data** and interpret results (4) apply this knowledge to (4) **propose molecular ecology research** of your own and (5) **critique peer proposals** through peer review.

Routine Responsibilities

The course is primarily based around instructor-led lectures on the current topic followed by either a class discussion or a coding practical. Discussions will be either informal, requiring no advance preparation, or formally focused on an accompanying research paper, led either by myself or student discussion-leaders. I will record all of my lectures and make them available as a permanent resource. There is no required textbook reading for this course, but I have listed recommended background readings for those who wish to get more context and supplementary explanations of some topics.

Assessments

Preparation for formal discussions: There are 9 formal readings that will be posted in Perusall on the course's Canvas site. For each paper, you will be expected to read the material before class as well as leave 3 independent or reply comments on the text, *unless you are a discussion leader for that paper*. Pay particular attention to commenting on the research questions answered and the molecular data used by the paper. **Your grade for discussions will be based in part on completing and commenting on each paper. Commenting on 8 papers (excepting the one you lead) for a total of 120 points.**

Discussion leading: Leaders will also read the text but instead of commenting, will gather other comments and guide the class in a real-time discussion of the material. I strongly encourage leaders to prepare a short Powerpoint presentation reviewing the paper's key findings and incorporating class questions. If you would like help in preparing, I encourage you to meet with me ahead of time to review the material and talk through a discussion plan. Please email me at least 48hrs before the discussion to set up a meeting. Each student is expected to **sign up for one paper** during the semester, and depending on enrollment, students may pair up to co-lead a paper. **Your grade for discussion leading is based on providing an accurate overview and conducting meaningful discussion of the paper's content for a total of 30 points.**

Coding practicals: In practice, the vast majority of data visualization and interpretation in molecular ecology is carried out in the open-source programming language R. It is NOT my expectation that you have any prior experience with R nor is the primary goal of this class to teach R coding. However, gaining experience with the data and analysis used in molecular ecology will be valuable as you develop your own research. As such, the coding practicals will give you chances to generate graphs and interpret data using R without needing to learn coding. Each assignment will consist of completing a guided R Shiny module or similar assignment and answering questions on a worksheet. **These worksheets will be handed in for a grade and we will discuss the assignment as a group. There are seven coding practicals throughout the semester for a total of 100 points.**

Out of Class tutorials (OOC): Most forms of molecular data (e.g. sequenced DNA reads) are produced in a form not (easily) manipulatable with R. To give you an introduction to the format of sequencing data, databases that catalog it, and webtools for processing it, you will complete out-of-class tutorials at points in the semester. The tutorials are self-guided and require only web access to complete. In the course of the semester, you will **complete 2 tutorials and turn in an accompanying assignment for a grade for total of 50 points.** They are:

- 1) **Molecular Ecology Data, File Types, Barcodes – Due 2/10**

2) Sequencing strategies, costs, online analysis resources – Due 3/3

Research Proposal: While gaining general knowledge is important, it is my goal that this course also provides you with direct benefits to your research if possible. To encourage you to apply the techniques of molecular ecology, you will submit a **4 page** research proposal at the end of the course. It can focus on a system you currently study or one you wish to research in the future, but either way it should include (1) a short background the organism and ecological/evolutionary process to be studied with citations to motivate the proposal (2) a methods section with specific data to be collected and analyses to perform (3) expected outcomes and implications for these results. Logistically, there will be three assignments to complete for the proposal, first a **proposal outline (due 2/24)**, second a **draft of the full proposal to be turned critiqued by your peers (the grade is based on the feedback you give, not your draft at this stage, draft due 4/2, peer reviews due 4/21)**, and finally **the full proposal is due during the exam period (4/30)**. I will explain the proposal assignments in more detail during the semester. **These assignments are worth a total of 100 points.**

Assignments and grading

Grades are based on:

- Reading and commenting on papers (as measured by Perusall, 8 papers) – 120 points
- Discussion leading (once) – 30 points
- Coding practical assignments (7) – 100 points
- Out of Class Tutorials (2) – 50 points
- Research proposal – 100 points
 - outline – 20 points
 - peer-review – 30 points
 - final proposal – 50 points

Total: 400 points

Grading Scale: A: 400 – 372 (93.00%), A-: 371 – 360 (90.00%), B+: 359 – 348 (87.00%), B: 347 – 332 (83.00%), B-: 331 – 320 (80.00%), C+: 319 – 308 (77.00%), C: 307 – 292 (73.00%), C-: 291 – 280 (70.00%), D+: 279 – 268 (67.00%), D: 267 – 252 (63.00%), D-: 251 – 240 (60.00%), EL: < 240. More information on University grading policies can be found here: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Attendance and participation: Attendance and participation are expected, whether in-person or digitally. This includes participating in paper discussions in class and online (for a grade). I also recognize that graduate students have research responsibilities outside of the classroom and may have field work that cannot be rescheduled. I am happy to accommodate these commitments but **please inform me proactively**, ideally at least 24hrs in advance of absence from a class. For unplanned absences or those that interfere with the timely completion of assignments, please contact me as soon as possible to discuss a timeline for completing said assignments. More information can be found here: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

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- Career Resource Center: 352-392-1601, www.career.ufl.edu/

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illegal, unjust, or creates unnecessary hardship. Academic grievances, grade disputes or general grievances should be directed to the University Ombuds: ombuds@ufl.edu

Course Calendar: Topics and important dates

Below is a class-by-class list of topics with associated discussion papers or coding practicals indicated. For Class Prep, days with a **pdf** require you to read (and comment on) a paper in Perusall *before class*. Days marked with **R** will involve a coding practical, so please bring a laptop but no other prep is necessary. The *MEE* textbook reading pages relate to the given day's lecture but are optional.

	Date	Unit	Topics	Reading and Coding Practical titles and links	Class Prep	Special Assignment Due
Week 1	1/12	Methods and Data in Molecular Ecology	Introductions. Primer on biological molecules.	<i>MEE: p. 13 – 25</i>		
	1/14		Quick start guide to course. Overview of variable markers.			
Week 2	1/19		Uses of markers. Identifying and defining populations & species. Sign-up for discussion leading.	Alstad, D. N., and K. W. Corbin. "Scale insect allozyme differentiation within and between host trees." <i>Evolutionary Ecology</i> 4.1 (1990): 43-56. https://link.springer.com/content/pdf/10.1007/BF02270714.pdf <i>MEE: p. 50 – 63, 71 – 75</i>	pdf	
	1/21		Extracting organic molecules: practical considerations.			
Week 3	1/26		Modern sequencing technologies. Comparisons of sequencing platforms.	Dandan Lang, et al. Comparison of the two up-to-date sequencing technologies for genome assembly: HiFi reads of Pacific Biosciences Sequel II system and ultralong reads of Oxford Nanopore. <i>GigaScience</i> , Volume 9, Issue 12, December 2020, g1aa123, https://doi.org/10.1093/gigascience/g1aa123 <i>MEE: p. 205 - 212</i>	pdf	
	1/28		Bioinformatics & cluster computing. Resources at UF.	https://help.rc.ufl.edu/doc/Getting_Started https://usegalaxy.org/		
Week 4	2/2	Focus on Individuals	Statistics in molecular ecology.			OOO 1 (MolEco Data & barcodes)
	2/4		Statistics and gene expression.	Coding practical: Linear models, false discovery rates, permutation tests.	R	
Week 5	2/9		Identifying expressed genes.	Coding practical: Classifying sex-biased genes.	R	
	2/11		Applications of differential gene expression. Discussion of research proposal outlines.	Andrés G de la Filia, et al. "Males That Silence Their Father's Genes: Genomic Imprinting of a Complete Haploid Genome." <i>Molecular Biology and Evolution</i> , Volume 38, Issue 6, June 2021, Pages 2566–2581 https://doi.org/10.1093/molbev/msab052	pdf	
Week 6	2/16		Introduction to proteomic data and methods.	Coding practical: Exploring RNA abundance vs protein abundance.	R	
	2/18		Proteomic applications to ecology.			

Week 7	2/23	Focus on Populations and Species	Genome assembly introduction.	Mongue, Andrew J., et al. "Genome report: Genome sequence of tuliptree scale, <i>Toumeyella liriodendri</i> (Gmelin), an ornamental pest insect." G3: Genes, Genomes, Genetics (2024). https://doi.org/10.1093/g3journal/jkae231 MEE: p. 36 – 38	pdf	Proposal Outline	
	2/25		Gene assembly and annotation.				
Week 8	3/2		Trait mapping with genetic data.	Coding practical: Finding candidate loci in genome-wide association data.	R	OOC 2 (Sequencing and online resources)	
	3/4		Pheromones and other molecules. peer review process and guidelines.	Tabata, Jun, et al. "A new class of mealybug pheromones: a hemiterpene ester in the sex pheromone of <i>Crisicoccus matsumotoi</i> ." <i>Naturwissenschaften</i> 99 (2012). https://doi.org/10.1007/s00114-012-0935-z	pdf		
Week 9	3/9		Sex determination and genomics.	Coding practical: Exploring sex chromosome turnover in Diptera https://amongue.shinyapps.io/sexchromshiny/	R		
	3/11		“Alternative” mating systems.	MEE: p. 194 - 195			
Week 10	3/16		SPRING BREAK				
	3/18		SPRING BREAK				
Week 11	3/23		Molecular evolution: neutral evolution.	Coding practical: Exploring the relationship between drift and population size. https://santiagosnchez.shinyapps.io/genetic_drift/ MEE: p. 47 – 49	R		
	3/25		Models for selection, identifying neutral and selected sites.	Coding practical: Exploring dominance, fitness effects, and links to population size https://mrtmj.shinyapps.io/mutation/ . https://shiney.zoology.ubc.ca/otto/DiploidSelection/	R		
Week 12	3/30		Application of variation to invasions and management.	You, M., Ke, F., You, S. <i>et al.</i> Variation among 532 genomes unveils the origin and evolutionary history of a global insect herbivore. <i>Nature Comm.</i> 11, 2321 (2020). https://doi.org/10.1038/s41467-020-16178-9	pdf		
	4/1	Introduction to molecular adaptation tests.			Full proposal draft for Peer Review		
Week 13	4/6	Testing for adaptation in an ecological context.	McDonald, John H., and Martin Kreitman. "Adaptive protein evolution at the Adh locus in <i>Drosophila</i> ." <i>Nature</i> 351.6328 (1991): 652-654.	pdf			
	4/8	Ecological factors determining population structure.					

Week 14	4/13	Focus on multiple species and environments	Using molecular data for conservation.	Freedman, MG, et al. Are eastern and western monarch butterflies distinct populations? A review of evidence for ecological, phenotypic, and genetic differentiation and implications for conservation. <i>Con. Sci. Prac..</i> 2021; 3:e432. https://doi.org/10.1111/csp2.432 <i>MEE: p. 165 - 186</i>	pdf	
	4/15		Incorporating environmental variables.			
Week 15	4/20		Coevolution between insects and symbionts.	Husnik, Filip, and John P. McCutcheon. "Repeated replacement of an intrabacterial symbiont in the tripartite nested mealybug symbiosis." <i>Proceedings of the National Academy of Sciences</i> 113.37 (2016): E5416-E5424. https://doi.org/10.1073/pnas.1603910113	pdf	Peer reviews Due
	4/29	Course Wrap up. Submit final research proposal, course evaluations				

ENY4461: Invertebrate Molecular Ecology

Dr. Andrew Mongue (he/him)

Contact: andrew.mongue@ufl.edu , 352-273-3940

Student hours, 2214 Steinmetz: Tuesday 12:45 – 1:45PM or by appointment (arrange via email)

Meeting time: Tuesday 1:55 – 2:45 PM, Thursday 1:55 – 3:50 PM, in person (synchronous).

Room: Steinmetz 1027

Prerequisites: ENY3005 & ENY4161

Textbooks: none required, Molecular Ecology and Evolution: An Introduction recommended + provided. I am providing (with the author's permission) a digital copy of Molecular Ecology and Evolution: An Introduction by Dr. Drew Davinack. Throughout the semester as I cover topics, I will suggest reading parts as another explanation for concepts. These readings are optional and not an all-or-nothing type of resource, feel free to check out some of them as needed. If you would like to use this resource, please find the textbook pdf on Canvas. The relevant readings are marked in the calendar with the abbreviation MEE. If you want the added context, reading before class is suggested.

Readings: We will cover the following research papers in this course. These readings *are mandatory* for discussions:

- Alstad, D. N., and K. W. Corbin. "Scale insect allozyme differentiation within and between host trees." *Evolutionary Ecology* 4.1 (1990): 43-56.
- Dandan Lang, et al. Comparison of the two up-to-date sequencing technologies for genome assembly: HiFi reads of Pacific Biosciences Sequel II system and ultralong reads of Oxford Nanopore. *GigaScience*, Volume 9, Issue 12, December 2020, gaa123
- Andrés G de la Filia, et al. "Males That Silence Their Father's Genes: Genomic Imprinting of a Complete Haploid Genome." *Molecular Biology and Evolution*, Volume 38, Issue 6, June 2021
- Mongue, Andrew J., et al. "Genome report: Genome sequence of tuliptree scale, *Toumeyella liriodendri* (Gmelin), an ornamental pest insect." *G3: Genes, Genomes, Genetics* (2024).
- Tabata, Jun, et al. "A new class of mealybug pheromones: a hemiterpene ester in the sex pheromone of *Crisicoccus matsumotoi*." *Naturwissenschaften* 99 (2012).
- You, M., Ke, F., You, S. *et al.* Variation among 532 genomes unveils the origin and evolutionary history of a global insect herbivore. *Nature Comm.* **11**, 2321 (2020).
- McDonald, John H., and Martin Kreitman. "Adaptive protein evolution at the Adh locus in *Drosophila*." *Nature* 351.6328 (1991): 652-654.
- Freedman, MG, et al. Are eastern and western monarch butterflies distinct populations? A review of evidence for ecological, phenotypic, and genetic differentiation and implications for conservation. *Con. Sci.*
- Husnik, Filip, and John P. McCutcheon. "Repeated replacement of an intrabacterial symbiont in the tripartite nested mealybug symbiosis." *Proceedings of the National Academy of Sciences* 113.37 (2016): E5416-E5424.

Credits: 3

Course Description: Addresses major topics in molecular ecology using insects as primary examples. The focus is on scientific insights provided by DNA, RNA, and proteins. Lessons cover both the technologies used to generate these data and their applications.

Student Learning Outcomes: In this course you will learn to (1) **recognize major themes** and research questions in molecular ecology (2) **distinguish between types of molecular data** by how they are collected and in what contexts they are most useful (3) **analyze molecular data** and interpret results.

Routine Responsibilities

The course is primarily based around instructor-led lectures on the current topic followed by either a class discussion or a coding practical. Discussions will be either informal, requiring no advance preparation, or formally focused on an accompanying research paper, led either by myself or student discussion-leaders. I will record all of my lectures and make them available as a permanent resource. There is no required textbook reading for this course, but I have listed recommended background readings for those who wish to get more context and supplementary explanations of some topics.

Assessments

Preparation for formal discussions: There are 9 formal readings that will be posted in Perusall on the course's Canvas site. For each paper, you will be expected to read the material before class as well as leave 3 independent or reply comments on the text, *unless you are a discussion leader for that paper*. Pay particular attention to commenting on the research questions answered and the molecular data used by the paper. **Your grade for discussions will be based in part on completing and commenting on each paper. Commenting on 8 papers (excepting the one you lead) for a total of 120 points.**

Discussion leading: Leaders will also read the text but instead of commenting, will gather other comments and guide the class in a real-time discussion of the material. I strongly encourage leaders to prepare a short Powerpoint presentation reviewing the paper's key findings and incorporating class questions. If you would like help in preparing, I encourage you to meet with me ahead of time to review the material and talk through a discussion plan. Please email me at least 48hrs before the discussion to set up a meeting. Each student is expected to **sign up for one paper** during the semester, and depending on enrollment, students may pair up to co-lead a paper. **Your grade for discussion leading is based on providing an accurate overview and conducting meaningful discussion of the paper's content for a total of 30 points.**

Coding practicals: In practice, the vast majority of data visualization and interpretation in molecular ecology is carried out in the open-source programming language **R**. It is NOT my expectation that you have any prior experience with R nor is the primary goal of this class to teach R coding. However, gaining experience with the data and analysis used in molecular ecology will be valuable as you develop your own research. As such, the coding practicals will give you chances to generate graphs and interpret data using R without needing to learn coding. Each assignment will consist of completing a guided R Shiny module or similar assignment and answering questions on a worksheet. **These worksheets will be handed in for a grade** and we will discuss the assignment as a group. **There are seven coding practicals throughout the semester for a total of 100 points.**

Out of Class tutorials (OOC): Most forms of molecular data (e.g. sequenced DNA reads) are produced in a form not (easily) manipulatable with R. To give you an introduction to the format of sequencing data, databases that catalog it, and webtools for processing it, you will complete out-of-class tutorials at points in the semester. The tutorials are self-guided and require only web access to complete. In the course of the semester, you will **complete 2 tutorials and turn in an accompanying assignment for a grade for total of 50 points**. They are:

- 1) **Molecular Ecology Data, File Types, Barcodes – Due 2/10**
- 2) **Sequencing strategies, costs, online analysis resources – Due 3/3**

Assignments and grading

Grades are based on:

- Reading and commenting on papers (as measured by Perusall) – 120 points
- Discussion leading – 30 points
- Coding practical assignments (7) – 100 points
- Out of Class Tutorials (2) – 50 points

Total: 300 points

Grading Scale: A: 300 – 279 (93.00%), A-: 278 – 270 (90.00%), B+: 269 – 261 (87.00%), B: 260 – 249 (83.00%), B-: 248 – 240 (80.00%), C+: 239 – 231 (77.00%), C: 230 – 219 (73.00%), C-: 218 – 210 (70.00%), D+: 209 – 201 (67.00%), D: 200 – 189 (63.00%), D-: 188 – 180 (60.00%), EL: < 179. More information on University grading policies can be found here: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

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	1/21		Extracting organic molecules: practical considerations.			
Week 3	1/26		Modern sequencing technologies. Comparisons of sequencing platforms.	Dandan Lang, et al. Comparison of the two up-to-date sequencing technologies for genome assembly: HiFi reads of Pacific Biosciences Sequel II system and ultralong reads of Oxford Nanopore. <i>GigaScience</i> , Volume 9, Issue 12, December 2020, giaa123, https://doi.org/10.1093/gigascience/giaa123 <i>MEE: p. 205 - 212</i>	pdf	
	1/28		Bioinformatics & cluster computing. Resources at UF.	https://help.rc.ufl.edu/doc/Getting_Started https://usegalaxy.org/		
Week 4	2/2		Statistics in molecular ecology.			
	2/4	Focus on Individuals	Statistics and gene expression.	Coding practical: Linear models, false discovery rates, permutation tests.	R	
Week 5	2/9		Identifying expressed genes.	Coding practical: Classifying sex-biased genes.	R	OOO 1 (MolEco Data & barcodes)
	2/11		Applications of differential gene expression.	Andrés G de la Filia, et al. "Males That Silence Their Father's Genes: Genomic Imprinting of a Complete Haploid Genome." <i>Molecular Biology and Evolution</i> , Volume 38, Issue 6, June 2021, Pages 2566–2581 https://doi.org/10.1093/molbev/msab052	pdf	
Week 6	2/16		Introduction to proteomic data and methods.	Coding practical: Exploring RNA abundance vs protein abundance.	R	
	2/18		Proteomic applications to ecology.			

Week 7	2/23	Focus on Populations and Species	Genome assembly introduction.	Mongue, Andrew J., et al. "Genome report: Genome sequence of tuliptree scale, <i>Toumeyella liriodendri</i> (Gmelin), an ornamental pest insect." <i>G3: Genes, Genomes, Genetics</i> (2024). https://doi.org/10.1093/g3journal/jkae231 <i>MEE: p. 36 – 38</i>	pdf	
	2/25		Gene assembly and annotation.			
Week 8	3/2		Trait mapping with genetic data.	Coding practical: Finding candidate loci in genome-wide association data.	R	OOC 2 (Sequencing and online resources)
	3/4		Pheromones and other molecules.	Tabata, Jun, et al. "A new class of mealybug pheromones: a hemiterpene ester in the sex pheromone of <i>Crisicoccus matsumotoi</i> ." <i>Naturwissenschaften</i> 99 (2012). https://doi.org/10.1007/s00114-012-0935-z	pdf	
Week 9	3/9		Sex determination and genomics.	Coding practical: Exploring sex chromosome turnover in Diptera https://amongue.shinyapps.io/sexchromshiny/	R	
	3/11		“Alternative” mating systems.	<i>MEE: p. 194 - 195</i>		
Week 10	3/16		SPRING BREAK			
	3/18		SPRING BREAK			
Week 11	3/23		Molecular evolution: neutral evolution.	Coding practical: Exploring the relationship between drift and population size. https://santiagosnchez.shinyapps.io/genetic_drift/ <i>MEE: p. 47 – 49</i>	R	
	3/25		Models for selection, identifying neutral and selected sites.	Coding practical: Exploring dominance, fitness effects, and links to population size https://mrtmj.shinyapps.io/mutation/ . https://shiney.zoology.ubc.ca/otto/DiploidSelection/	R	
Week 12	3/30		Application of variation to invasions and management.	You, M., Ke, F., You, S. <i>et al.</i> Variation among 532 genomes unveils the origin and evolutionary history of a global insect herbivore. <i>Nature Comm.</i> 11 , 2321 (2020). https://doi.org/10.1038/s41467-020-16178-9	pdf	
	4/1		Introduction to molecular adaptation tests.			
Week 13	4/6		Testing for adaptation in an ecological context.	McDonald, John H., and Martin Kreitman. "Adaptive protein evolution at the Adh locus in <i>Drosophila</i> ." <i>Nature</i> 351.6328 (1991): 652-654.	pdf	
	4/8		Ecological factors determining population structure.			

Week 14	4/13	Focus on multiple species and environments	Using molecular data for conservation.	Freedman, MG, et al. Are eastern and western monarch butterflies distinct populations? A review of evidence for ecological, phenotypic, and genetic differentiation and implications for conservation. <i>Con. Sci. Prac.</i> 2021; 3:e432. https://doi.org/10.1111/csp2.432 <i>MEE: p. 165 - 186</i>	pdf	
	4/15		Incorporating environmental variables.			
Week 15	4/20		Coevolution between insects and symbionts.	Husnik, Filip, and John P. McCutcheon. "Repeated replacement of an intrabacterial symbiont in the tripartite nested mealybug symbiosis." <i>Proceedings of the National Academy of Sciences</i> 113.37 (2016): E5416-E5424. https://doi.org/10.1073/pnas.1603910113	pdf	
	4/29	Course Wrap up. Grades finalized.				

Differences between Undergraduate and Graduate Invertebrate Molecular Ecology

The graduate version of this course includes three assignments based around an additional student learning outcomes (SLO): (4) **propose molecular ecology research** of your own and (5) **critique peer proposals** through peer review.. The graduate students must outline a proposal, peer review draft proposals, and incorporate feedback from others' peer reviews as noted below for a total of 100 points (25%) of the total course grade. These three assignments are omitted from the undergraduate version of the course.

- Research proposal – 100 points
 - outline – 20 points
 - peer-review – 30 points
 - final proposal – 50 points

Cover Sheet: Request 23141

SWS 5132 - Tropical Soil Management

Info

Process	Course Modify Grad
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Michael Sisk mjsisk@ufl.edu
Created	8/10/2026 10:27:30 AM
Updated	9/9/2026 12:38:27 PM
Description of request	SWES would like to make a small edit to course title, changing from "Tropical Soil Management" to "Tropical Soils Management" and removing both the undergraduate course (SWS 3022 - Intro to Soils in the Environment) and graduate course (SWS 5050 - Soils for Environmental Professionals) prerequisites from this class.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Soil and Water Science 60210000	Susan Crow		8/10/2026
No document changes					
College	Pending	CALS - College of Agricultural and Life Sciences			8/10/2026
No document changes					
Graduate Curriculum Committee					
No document changes					
University Curriculum Committee Notified					
No document changes					
Statewide Course Numbering System					
No document changes					
Graduate School Notified					
No document changes					
Office of the Registrar					
No document changes					
College Notified					
No document changes					

Modify Course Request (v.2026) for request 23141

Info

Request: SWS 5132 - Tropical Soil Management

Description of request: SWES would like to make a small edit to course title, changing from "Tropical Soil Management" to "Tropical Soils Management" and removing both the undergraduate course (SWS 3022 - Intro to Soils in the Environment) and graduate course (SWS 5050 - Soils for Environmental Professionals) prerequisites from this class.

Submitter: Michael Sisk mjsisk@ufl.edu

Created: 8/10/2026 10:13:27 AM

Form version: 1

Responses

Degree Type Graduate

Will this course modification impact a General Education or Teacher Preparation Program course? No

Current Prefix SWS

Current Course Level 5

Current Course Number 132

Current Lab Code None

Current Course Title Tropical Soil Management

Effective Term Earliest Available

Effective Year Earliest Available

Requested Action Other (selecting this option opens additional form fields below)

Change Course Prefix? No

Change Course Level? No

Change Course Number? No

Change Lab Code? No

Change Course Title? Yes

Current Course Title Tropical Soil Management

Proposed Course Title Tropical Soils Management

Change Transcript Title? Yes

Current Transcript Title Tropical Soil Management

Proposed Transcript Title (30 char. max) Tropical Soils Management

Change Credit Hours? No

Change Variable Credit? No

Change S/U Only? No

Change Contact Type? No

Change Course Type? No

Change Rotating Topic Designation? No

Change Repeatable Credit? No

Change Status of Multiple Offerings in a Single Semester? No

Change Catalog Course Description? No

Change Course Objectives? No

Change Prerequisites? Yes

Current Prerequisites SWS 3022 - Introduction to Soils in the Environment OR SWS 5050 - Soils for Environmental Professionals

Proposed Prerequisites None

Change Corequisites? No

Rationale Requesting title change because currently titled "Tropical Soil Mgmt" however, there are at least six (6) major soil orders or types commonly found across tropical regions. In the United States Department of Agriculture (USDA) soil taxonomy system, these primary tropical soil groups include Oxisols, Ultisols, Alfisols, Inceptisols, Entisols, and Vertisols. Adding an "s" at the end of "Soil" in title will more appropriately reflect the course content since will study multiple tropical soils, not just one tropical soil order.

Also, removal of prerequisites from class, not sure how an undergraduate course offering (SWS 3022) ended up as a prerequisite for a graduate-level course, so we need to remove. The course instructor (Dr. Nunes) has found that SWS 5050 - Soils for Environmental Professionals graduate-level course is not needed to be successful in his class, also this prerequisite adds an additional layer of registration complexity for graduate students who did not attend UF b/c while they may have a sufficient soils background and coursework, they get a prerequisite block b/c their previous graduate level coursework is not from UF, thus registration system blocks them from adding his course.

Syllabus Requirements Syllabus Has Been Downloaded from Simple Syllabus, Revised to Reflect the Requested Changes, and Complies with the Current UF Syllabus Policy.

Syllabus Edits/Comments	Please use two decimal places in the assignment of grades, or use points (or both) - HJM
--------------------------------	--

I have included that within the table.

Letter	Percentage Value	
A	94.00 - 100%	
A -	90.00 - 93.99%	
B +	87.00 - 89.99%	
B	83.00 - 86.99%	
B -	80.00 - 82.99%	
C +	77.00 - 79.99%	
C	73.00 - 76.99%	
C -	70.00 - 72.99%	
D +	67.00 - 69.99%	
D	63.00 - 66.99%	
D -	60.00 - 62.99%	
E	Below 60.00%	

If possible in Simple Syllabus, I would try to put the due dates of the assignments and the take home exams in the Course Schedule table. Is there a final exam on Dec. 8 th ? Is that one of the take-home exams? – HJM

Added within the " Topics " column. I could not add a new column to the PDF file.

Course Schedule

Part and Dates	Topics	Recommended Readings
Part I:	The Tropical Environment	
Aug 20-25	Course Introduction Natural Tropical Environment The Human Environment Assignment # 1 due on Aug 27	Syllabus & Canvas instructions Chapter 1 & related lecture Chapter 2 & related lecture
Part II:	Pedology, Physics, Chemistry, Biology	
Aug 27 (Th) Sept 1 (T) Sept 3 (Th) Sept 8 & 10 Sept 15 & 17 Sept 22 & 24 Sept 29 & Oct 1	Soils of the Tropics FCC System Soil Mineralogy Organic Carbon Soil Biology Soil Physics and Water Soil Acidity Assignment # 2 due on Sept 25	Chapters 3-4 & related lecture Chapter 5 & related lecture Chapter 8 & related lecture Chapter 11 & related lecture Chapter 10 & related lecture Chapter 6 & related lecture Chapter 9 & related lecture
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Oct 6 (T) Oct 8-13 Oct 15-20 Oct 22 (T)	Management of N Management of P & S Micronutrients N & P in Florida Exam # 1 on Oct 15 Assignment # 3 due on Oct 22	Chapter 12-15 & related lectures
Part IV:	Soil Health	
Oct 27-29 Nov 3 (T) Nov 5 (Th)	Soil Health Soil and Human Health Link Biofortification Assignment # 4 due on Nov 9	Related lecture Related lecture Related lecture
Part V:	Management Strategies	

Part and Dates	Topics	Recommended Readings
Nov 10 (T) Nov 12 (Th) Nov 17 (T) Nov 19 (Th)	Integrated Crop-Livestock Forestry and Agroforestry Circular Agriculture The Brazilian example	Related Lecture Related Lecture Related Lecture Related Lecture
Nov 23-28	Holiday	
Dec 1-4	Reading	Reading days
Dec-8	Final Exam	

Graduate courses require a reading list if no textbook is required (for both Syllabi)-PWI

Although we don't have a required textbook, we do have a recommended textbook for the course. Within the column "Recommended Readings", we have included all chapters that must be read for each class and topic.

Recommended Materials

PROPERTIES AND MANAGEMENT OF TROPICAL SOILS

ISBN: 9781107176058

Authors: PEDRO A. SANCHEZ

Publisher: CAMBRIDGE

Edition: SECOND

Recommended Readings	
From recommended Textbook, read:	
	Syllabus & Canvas instructions Chapter 1 & related lecture Chapter 2 & related lecture
	Chapters 3-4 & related lecture Chapter 5 & related lecture Chapter 8 & related lecture Chapter 11 & related lecture Chapter 10 & related lecture Chapter 6 & related lecture Chapter 9 & related lecture
	Chapter 12-15 & related lectures

Changed to “Explain”.

I usually use Bloom's Taxonomy to define the objectives and learning outcomes.

Expectations and Student Learning Outcomes

At the end of this course, students will be able to:

1. Describe the diversity and variability of culture, people, and problems faced in the tropics.
2. Compare the diversity and variability of soils in the tropics, *e.g.*, physical, chemical, and mineralogical properties.
3. Identify and propose strategies to improve and/or sustain soil functions under tropical conditions.
4. Discuss concepts and principles of sustainable agriculture applicable to tropical soils and their implications for global challenges.
5. Explain how to implement sustainable management practices for the tropics.



SWS 5132 | Tropical Soils Management

Delivery Method: Online
T | Period 11 (06.15 PM-07.05 PM) Online

Instructor Information

Name: Marcio R. Nunes

Email: marcionunes@ufl.edu

Telephone: 3522943127 (Office)

Office Hours

After class and by appointment

Preferred Method of Communication: Canvas and e-mail

Office Location

G169 McCarty Hall A

Course Details

Catalog Description: Characteristics and management of tropical soils. Technologies that minimize industrial inputs.

Pre- and Co-Requisites: None

Credit Hours: 3

Course Fees: \$0.00

Additional Course Description

The course is part of the UF Virtual Exchange program and has students from lead universities based in the tropics (e.g., Univ. of São Paulo, Federal Univ. of Lavras, Brazil). Throughout the course, we work around the question: How can we improve food production within the tropics without depleting our fragile soil and natural resources? The course is designed for students interested in the principles of management of soils under tropical environments. The overall goal is to provide students with a deep understanding of the diversity and variability of tropical soils and their agronomic and ecological practical applications. First, we focus on basic aspects of tropical soils (e.g., functions in society, classification, mineralogy, physical and biological

properties, and principles of soil fertility). Afterward, we work on strategies to overcome their major constraints and improve food production while mitigating degradation of processes and functions of those soils (e.g., acidification, compaction, erosion). We emphasize principles of sustainable agriculture, soil health, and the circular economy. Overall, the students obtain skills applicable to agriculture, soil science, agronomy, environmental science, and other related disciplines. By the end of the program, the students will be able to decide on management strategies to improve food production while decreasing the agricultural footprint in the tropics.

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1. This course introduces students to: (a) the diversity and variability of culture, people, and problems faced in the tropics, and (b) the diversity and variability of soils of the tropics, with emphasis on soil properties and processes (e.g., soil physical, chemical, and mineralogical), soil constraints and limitations, and agricultural systems.
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5. Explain how to implement sustainable management practices for the tropics.

Methods of Evaluation

Course Assessment and Grading

Student learning is assessed through 2 take-home exams (open-book, closed-mouth), assignments (as described below), and class participation. The percentages for each component are presented below.

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Due: August 27

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Handed out: August 27

Due: September 25

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Handed out: October 13

Due: October 22

A4: 10% of the final grade - related to course Part IV (Soil Health)

Handed out: October 29

Due: November 9

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Class participation	10
Total	100

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Letter grade and percentage

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Dec-8	Final Exam	

Alignment of SLOs

Assignment 1 is related to the first part of the course, which is focused on the tropical environment of the tropics. This assignment was meant to help the students get even more familiar with the topic by working in teams with students from the tropics and temperate regions. At the end, after completing this activity, the students will be able to describe the diversity and variability of culture, people, and problems faced in the tropics.

Assignment 2 is related to the second part of the course, which is focused on the soils of the tropics, mainly their characteristics, properties, and processes. This assignment has a list of activities that are going to be developed in teams integrating students from several regions of the tropics, allowing exchange of knowledge among them. They will bring their own experiences to complement the course content. At the end, they will be able to compare the diversity and variability of soils in the tropics and their main constraints/limitations and strengths.

Assignments 3 and 4 are complementary and focused on soil fertility and soil health, the third and fourth major topics of the course. The proposed activities under this assignment will help the students identify and propose strategies to improve and/or sustain soil functions under tropical conditions and allow them to discuss concepts and principles of sustainable agriculture applicable to tropical soils and their implications for global challenges.

Combined, the assignments 1-4 will help the students improve their understanding of the content, develop their communication skills, enhance their critical thinking about the tropics, and finally demonstrate how to implement sustainable management practices for the tropics.

University Policies and Resources

Information about grading policies, support for students with disabilities, course evaluations, the Honor Code, and other course policies and campus resources can be found on the [Syllabus Policies page](#).

Attendance Policy

Excused and Unexcused Absences

Students may only participate in classes if they are registered officially or approved to audit with evidence of having paid audit fees. The Office of the University Registrar provides official class rolls to instructors.

Students are responsible for satisfying all academic objectives as defined by the instructor. Absences count from the first-class meeting.

Acceptable reasons for absence from or failure to engage in class include illness; Title IX-related situations; serious accidents or emergencies affecting the student, their roommates, or their family; special curricular requirements (e.g., judging trips, field trips, professional conferences); military obligation; severe weather conditions that prevent class participation; religious holidays; participation in official university activities (e.g., music performances, athletic competition, debate); and court-imposed legal obligations (e.g., jury duty or subpoena). Other reasons (e.g., a job interview or club activity) may be deemed acceptable if approved by the instructor.

For all planned absences, a student in a situation that allows an excused absence from a class, or any required class activity must inform the instructor as early as possible prior to the class. For all unplanned absences because of accidents or emergency situations, students should contact their instructor as soon as conditions permit.

Students shall be permitted a reasonable amount of time to make up the material or activities covered during absence from class or inability to engage in class activities because of the reasons outlined above.

If a student does not participate in at least one of the first two class meetings of a course or laboratory in which they are registered, and they have not contacted the department to indicate their intent, the student can be dropped from the course. Students must not assume that they will be dropped, however. The department will notify students if they have been dropped from a course or laboratory.

The university recognizes the right of the instructor to make attendance mandatory and require documentation for absences (except for religious holidays), missed work, or inability to fully engage in class. After due warning, an instructor can prohibit further attendance and subsequently assign a failing grade for excessive absences.

Religious Holidays Guidelines

At the University of Florida, students and faculty work together to allow students the opportunity to observe the holy days of their faith. A student should inform the faculty member of the religious observances of their faith that will conflict with class attendance, with tests or examinations, or with other class activities prior to the class or occurrence of that test or activity. The faculty member is then obligated to accommodate that particular student's religious observances. Because students represent a myriad of cultures and many faiths, the University of Florida is not able to assure that scheduled academic activities do not conflict with the holy days of all religious groups. Accordingly, individual students should make their need for an excused absence known in advance of the scheduled activities.

The Florida Board of Education and state law govern university policy regarding observance of religious holidays.

Guidelines

- Students, upon prior notification to their instructors, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith.
- Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence.
- Students shall not be penalized due to absence from class or other scheduled academic activity because of religious observances.

If a faculty member is informed of or is aware that a significant number of students are likely to be absent from class because of a religious observance, the faculty member should not schedule a major exam or other academic event at that time.

A student who is to be excused from class for a religious observance is not required to provide a second party certification of the reason for the absence. Furthermore, a student who believes that they have been unreasonably denied an education benefit due to religious beliefs or practices may seek redress through the student grievance procedure.

Absence due to Illness

A student who is absent from class or any required class-related activity because of illness should contact their instructor, if feasible, as early as possible prior to the missed class or activity.

Students shall be permitted a reasonable amount of time to make up the material or activities covered during an excused absence.

Students should contact their college by the deadline to drop a course for medical reasons. Students can petition the Dean of Students Office to drop a course for medical reasons. The university's policy regarding medical excuse from classes is maintained by the Student Health Care Center.

Twelve-Day Rule

Students who participate in university-sponsored athletic or scholarly activities are permitted to be absent 12 scholastic days per semester without penalty. A scholastic day is any day on which regular class work is scheduled as defined in the approved university calendar. [More Info](#)

The student or student's advisor must notify the instructor as early as possible prior to the anticipated absence to allow ample time for accommodations. Instructors must be flexible and not penalize students when re-scheduling during-term and final exams, class assignments, and other required activities and must follow the UF Attendance Policy herein and UF Examination Policies. As noted in the UF Examination Policies, during-term exams should be re-scheduled no later than before the end of the semester, while final exams no later than 90 days after the originally scheduled exam time. However, instructors are encouraged to re-schedule final and during-term exams, assignments, and other activities as soon as possible after the last day of the absence and must not penalize the student in any way. [More Info](#)

A group's schedule that requires absence of more than 12 scholastic days should be adjusted so that no student is absent from campus more than 12 scholastic days. Students who previously have been warned in writing by their instructor about the impact of absences on their individual class performance should not incur additional absences, even if they have not been absent 12 scholastic days. The student is responsible to maintain satisfactory academic performance and attendance.

Late and Make Up Work Policy

Excused Absences and Make-Up Work:

Accepted under valid reasons (i.e., illness, serious family emergencies, religious observances, and military or official university activities). A new time frame can be discussed and approved with the instructor. I will require a doctor's note or official notification from the Dean of Students office.

Technology in the Classroom

AI can be used to develop the students' knowledge, but the final answer must be provided by the students.



SWS 5132 | Tropical Soils Management

Instructor Information

Name: Marcio R. Nunes

Email: marcionunes@ufl.edu

Telephone: 3522943127 (Office)

Office Hours

After class and by appointment

Preferred Method of Communication: Canvas and e-mail

Office Location

G169 McCarty Hall A

Course Details

Catalog Description: Characteristics and management of tropical soils. Technologies that minimize industrial inputs.

Pre- and Co-Requisites: None

Credit Hours: 3

Course Fees: \$0.00

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A group's schedule that requires absence of more than 12 scholastic days should be adjusted so that no student is absent from campus more than 12 scholastic days. Students who previously have been warned in writing by their instructor about the impact of absences on their individual class performance should not incur additional absences, even if they have not been absent 12 scholastic days. The student is responsible to maintain satisfactory academic performance and attendance.

Late and Make Up Work Policy

Excused Absences and Make-Up Work:

Accepted under valid reasons (i.e., illness, serious family emergencies, religious observances, and military or official university activities). A new time frame can be discussed and approved with the instructor. I will require a doctor's note or official notification from the Dean of Students office.

Technology in the Classroom

AI can be used to develop the students' knowledge, but the final answer must be provided by the students.

Cover Sheet: Request 22680

ABE5009 Control Methods in SmartAg Systems Enable-AI

Info

Process	Course Add to Existinggrad AI
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Jenna Molen jenna.molen@ufl.edu
Created	3/3/2026 1:49:17 PM
Updated	8/31/2026 9:25:41 AM
Description of request	Approval flow for AI Course Designations Faculty members can request AI course designations, which will be processed through the following approval stages: Department approval College approval AI Education Committee (AI-Ed) approval If the request is solely for adding an AI designation without new curricular content, it is recommended by the AI Education Committee to bypass the departmental and college curriculum committees. However, if a new course with an AI designation is proposed, the standard curriculum approval process must be followed.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Agricultural and Biological Engineering 60070000	Gregory Kiker		8/31/2026
ABE 5009 HWCOE-Syllabus-Graduate-Course-Spring 2026 v2.pdf					3/3/2026
College	Pending	CALS - College of Agricultural and Life Sciences			8/31/2026
No document changes					
AI Curriculum Committee					
No document changes					
Graduate Curriculum Committee					
No document changes					
Office of the Registrar					
No document changes					
Graduate Catalog					
No document changes					
College Notified					
No document changes					

Existing AI Course (without changes) for request 22680

Info

Request: ABE5009 Control Methods in SmartAg Systems Enable-AI

Description of request: Approval flow for AI Course Designations

Faculty members can request AI course designations, which will be processed through the following approval stages:

Department approval

College approval

AI Education Committee (AI-Ed) approval

If the request is solely for adding an AI designation without new curricular content, it is recommended by the AI Education Committee to bypass the departmental and college curriculum committees. However, if a new course with an AI designation is proposed, the standard curriculum approval process must be followed.

Submitter: Jenna Molen jenna.molen@ufl.edu

Created: 3/3/2026 1:27:11 PM

Form version: 1

Responses

Canvas Availability Yes, I acknowledge this requirement.

Assessment Data Yes, I acknowledge this requirement.

Weekly Schedule and Assignments Yes, I acknowledge this requirement.

Course Prefix and Number ABE5009

Course Title Control Methods in SmartAg Systems

Lab Code None

Delivery Method HB - Hybrid Blend (50-79% of course content taught outside of classroom)

Effective Term Earliest Available

Effective Year Earliest Available

Credit Hours 3

Prerequisites MAP2302

AI Percentile Designation This course contains greater than 10% and less than 50% AI-related content.

Requested AI Categories (10%-50%) Enable-AI: AI Enabled

SLO Statement Requirement I understand and agree to include the required statements in the course syllabus.

Rationale for the AI Category My class has approximately 40% AI related content, the other 60% is classical and modern control theory.

It would fall into the Enable-AI category for SLO3.

Course Description Design, analysis, simulation and programming modern control methods for applications in production agriculture, biological and food engineering, land and water resources. Students will learn theoretical concepts, application programming, and simulation techniques using classical and modern control approaches, fuzzy logic, neural networks and other intelligent learning algorithms.

Course Objectives Gain ability to design, program, and analyze control systems, which can be applied to a broad range of engineering applications relevant to SmartAg systems including, but not limited to, field production, food processing, irrigation systems, and biological systems.

- Master theoretical concepts associated with control system design using classical control and state space

approaches, along with neural networks and fuzzy logic based solutions. Theory will be reinforced through homework, programming and term projects.

- Master how to evaluate control oriented design problems, and formulate a solution. Students will develop a formal report and present concepts to class. Students will develop team skills and communicate ideas in written and oral format. Projects will reinforce need for ethical design practices.

Instructor(s) Tom Burks

Required Links and Policies Yes

Control Methods in SmartAg Systems

ABE 5009 Section 24940

Credits: 3

Class Periods: T, TH: 7th and 8th Period, from 1:55PM to 3:50 PM

Location: Hybrid Zoom and 211 Rogers Hall

Academic Term: Spring 2026

Instructor:

Name: Tom Burks

Email Address: tburks@ufl.edu

Office Hours: By email appointment only, for Zoom or personal meetings,

Office: Rogers Hall room 225

Teaching Assistants:

Please contact through the Canvas website

- TBD, Name of TA, email address, office location, office hours

Course Description

Design, analysis, simulation and programming modern control methods for applications in production agriculture, biological and food engineering, land and water resources. Students will learn theoretical concepts, application programming, and simulation techniques using classical and modern control approaches, fuzzy logic, neural networks and other intelligent learning algorithms. *Offered each spring*

Course Pre-Requisites

- Differential Equations or equivalent
- Physics with Calculus
- Dynamics or equivalent

Course Recommendation

- Engineering graduate student
- Fluent in general programming language such as C, C++, Python, or Visual Basic, and also MATLAB

Course Objectives

- Gain ability to design, program, and analyze control systems, which can be applied to a broad range of engineering applications relevant to SmartAg systems including, but not limited to, field production, food processing, irrigation systems, and biological systems.
- Master theoretical concepts associated with control system design using classical control and state space approaches, along with neural networks and fuzzy logic based solutions. Theory will be reinforced through homework, programming and term projects.
- Master how to evaluate control oriented design problems, and formulate a solution. Students will develop a formal report and present concepts to class. Students will develop team skills and communicate ideas in written and oral format. Projects will reinforce need for ethical design practices.

Materials and Supply Fees

Not Applicable

Meeting times and Lecture Content

- Normal meeting time is scheduled and planned for Tuesday and Thursdays during 7th and 8th period in Room 211 Rogers Hall for traditional lecture. However, occasionally we will meet on zoom, or have a pre-recorded demonstration lecture on using software or hardware that will be posted to a shared folder, or we may meet in Rogers Hall instrumentation lab 214 for hands on laboratory instructions. Class meeting location maybe found on the canvas calendar event for that day.

Textbooks and Software

Recommended/Reference Materials

- Fuzzy and Neural Control by Nguyen, Prasad, Walker and Walker
- 2003, 1st Edition
- ISBN: 1-58488-244-1

- Modern Control Engineering by Ogata
- 2015, 5th Edition
- ISBN: 978-9332550162

- Intelligent Control Design and Matlab Simulation by Jinkun Liu
- 2018, 1st Edition
- ISBN: 978-9811052620

Other Resources

Matlab Controls Tutorial: <https://ctms.engin.umich.edu/CTMS/index.php?aux=Home>

Course Topic List (Potential)

- Topic 1: Intro to SmartAg, IoT, Sensors, Embedded devices, Networks, IoT platforms
- Topic 2. Mathematical Modeling of Dynamic Mechanical, Electrical, and Fluid Systems
- Topic 3. Dynamic Behavior, Transient and Steady State Response with Matlab Tutorials
- Topic 4: Block Diagrams, Laplace transform, Stability, Linearization, non-linear systems
- Topic 5: Lag and Lead Compensation, PID Control and Design with Matlab Tutorials
- Topic 6. Design and Analysis of Systems with Matlab Tutorials
- Topic 7. Frequency Response Analysis with Matlab Tutorials
- Topic 8. State Space Analysis, Controllability and Observability with Matlab Tutorials
- Topic 9. Fuzzy Math, Sets and Rules, Fuzzy Relations and Defuzzification
- Topic 10. Fuzzy Control
- Topic 11. Adaptive Fuzzy Control
- Topic 12. Neural Networks, BP Nets, RBF Nets
- Topic 13. Neural Networks in Control
- Topic 14. Fuzzy-Neural Systems
- Topic 15. Implementing AI enhance Control on Embedded Devices (Raspberry Pi, Jetson Nano)

Supplemental Recorded Topics from Guest Speakers

The class will have access to several additional special lecture topics that are pre-recorded from another class on applied SmartAg. You will not be required to do homework or quizzes on these topics.

1. Topic 1: Measurement Systems, Dynamic Signals and Data Acquisition (Burks, Rec.)
2. Topic 2: Intro. To Basic Circuits and RLC Circuits (Burks, Rec.)
3. Topic 3: Software & Programming of Microcontrollers (Ziwen Yu, Rec.)
4. Topic 4: Data in SmartAg Applications (Ziwen Yu, Rec.)
5. Topic 5: Unmanned Aerial Systems and Applications in Agriculture (Yiannis Ampatzidis, Rec.)
6. Topic 6: Smart Irrigation (Sandra Guzman, Rec.)
7. Topic 7: SmartAg Applications in Controlled Environments (Ying Zhang, Rec.)
8. Topic 8: SmartAg Applications in Fruit/Veg Production (Dana Chao, Rec.)

Attendance Policy, Class Expectations, and Make-Up Policy

a) There will be approximately one homework assignment per week, due by midnight on Saturday. You may discuss homework with your classmates, but you may not copy verbatim from another student. Cheating will

affect all parties involved. A scanned copy of homework will be turned in online in canvas with a one-day grace period at full points, zero percentage after that.

b) Programming and simulation reports will be assigned on an approximate two to three week basis, examples will be used that are relevant to lecture material. All relevant project material, code, plots and write up will be submitted on line through canvas in a combined pdf file. While a copy of operational coding files will be emailed to instructor in native format, such as Matlab m-files that are ready to execute. There will be a one-day grace period with full points, and zero percentage after that.

c) The term paper will more fully expose the students to the material covered in the class as applied to SmartAg applications. Students will choose topics that are relevant to their area of interest and will be responsible to conduct a literature review of their topic and compose a paper reporting on said technology and how it is relevant to this class. Proper literary methods will be used to notate sources according to the assignment description. Assignments will be turned in online through canvas with a one-day grace period at full points, and zero percentage after that. Due dates will be posted on CANVAS.

d) The term project will be a more comprehensive programming assignment, that will more fully expose the students to the material covered in the class. The scope of the term project will be defined by instructor along with appropriate data sets and expected outcomes. Students will be responsible to design/conceive a SmartAg solution showing simulation program solutions to validate concept. Assignments will be turned in online through canvas with a one-day grace period at full points, and zero percentage after that. Due dates will be posted on CANVAS.

e) Two open book take-home exams will be given, a mid-term and a final will be scheduled. Exams will be timed two-hours in duration, and open book. Exam dates will be posted on CANVAS.

f) Excused absences must be consistent with university policies in the undergraduate catalog and require appropriate documentation. (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>)

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets	300	30%
Programming/Simulation	200	20%
Midterm Exam	150	15%
Final Exam	150	15%
Term Projects	100	10%
Term Paper	100	10%
	1000	100%

Grading Policy

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.

Cover Sheet: Request 22043

ABE 6165 - Know-AI

Info

Process	Course Add to Existinggrad AI
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Jenna Molen jenna.molen@ufl.edu
Created	10/23/2025 10:42:09 AM
Updated	8/31/2026 9:24:22 AM
Description of request	add AI designation to existing course

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Agricultural and Biological Engineering 60070000	Gregory Kiker		8/31/2026
ABE6165_revised 2.pdf					10/23/2025
College	Pending	CALS - College of Agricultural and Life Sciences			8/31/2026
No document changes					
AI Curriculum Committee					
No document changes					
Graduate Curriculum Committee					
No document changes					
Office of the Registrar					
No document changes					
Graduate Catalog					
No document changes					
College Notified					
No document changes					

Existing AI Course (without changes) for request 22043

Info

Request: ABE 6165 - Know-AI

Description of request: add AI designation to existing course

Submitter: Jenna Molen jenna.molen@ufl.edu

Created: 10/23/2025 10:38:50 AM

Form version: 1

Responses

Canvas Availability Yes, I acknowledge this requirement.

Assessment Data Yes, I acknowledge this requirement.

Weekly Schedule and Assignments Yes, I acknowledge this requirement.

Course Prefix and Number ABE 6165

Course Title Applied Machine Vision and Deep Learning for Agricultural Systems

Lab Code None

Delivery Method PC - Primarily Classroom (0-49% of course content taught outside of classroom)

Effective Term Earliest Available

Effective Year Earliest Available

Credit Hours 3

Prerequisites instructor permission

AI Percentile Designation This course contains 50% or greater AI-related content and/or assignments.

Requested AI Categories Know-AI: Know and Understand AI

SLO Statement Requirement I understand and agree to include the required statements in the course syllabus.

Rationale for the AI Category This course accomplishes the AI Designation objective of the subject areas listed above. This course explains the definitions of AI, computer vision, machine learning, and deep learning. It also explores potential AI applications in precision agriculture.

Course Description The exploration of applied machine vision with a focus on modern deep learning techniques to solve problems in agricultural and food systems (AFS). Learn and apply the principles of machine vision, convolutional neural networks, and recurrent neural networks for image semantic understanding and processing to address challenges in AFS, such as visual navigation of agricultural robots, monitoring and managing crops and livestock, and food postharvest sorting. The final class project provides an opportunity for hands-on experience based on a research project or a self-motivated study initiated from the course. For group projects, peer evaluation will be used.

Course Objectives Upon the completion of this course, the students should be able to:

- Explain fundamental concepts and principles of machine vision, image processing, and deep learning.
- Describe various modern deep learning architectures.
- Determine proper architectures for specific engineering applications.
- Apply and develop models using common machine learning frameworks.
- Analyze the results in specific engineering settings.

Instructor(s) Changying "Charlie" Li, Ph.D.

Required Links and Policies Yes

Applied Machine Vision and Deep Learning for Agricultural Systems

ABE 6165

Class Periods: Tuesdays and Thursdays 12:50-2:05 pm.

Location: Frazier Rogers Hall, Room 282.

Academic Term: Fall 2025

Credits: 3 credits

Instructor: Changying “Charlie” Li, Ph.D., Email: cli2@ufl.edu; Phone: 352- 294-6727.

Office Hours: by appointment.

Pre-requisites: Permission of the Instructor.

Course description and general topics:

The exploration of applied machine vision with a focus on modern deep learning techniques to solve problems in agricultural and food systems (AFS). Learn and apply the principles of machine vision, convolutional neural networks, and recurrent neural networks for image semantic understanding and processing to address challenges in AFS, such as visual navigation of agricultural robots, monitoring and managing crops and livestock, and food postharvest sorting. The final class project provides an opportunity for hands-on experience based on a research project or a self-motivated study initiated from the course. For group projects, peer evaluation will be used.

AI Credit

Know-AI: Know the basic functions of AI and how to correctly use AI applications. AI course content is over 50%.

This course accomplishes the AI Designation objective of the subject areas listed above. This course explains the definitions of AI, computer vision, machine learning, and deep learning. It also explores potential AI applications in precision agriculture.

Course learning objectives:

Upon the completion of this course, the students should be able to:

- Explain fundamental concepts and principles of machine vision, image processing, and deep learning.
- Describe various modern deep learning architectures.
- Determine proper architectures for specific engineering applications.
- Apply and develop models using common machine learning frameworks.
- Analyze the results in specific engineering settings.

Suggested textbooks and references:

The following textbooks and references are suggested for the course. Most of the materials can be accessed online for free.

1. Zhang, Q. (2016). *Precision agriculture technology for crop farming*. Taylor & Francis.
2. Richard Szeliski. *Computer Vision: Algorithms and Applications*. Springer.

3. Hartley, Richard, and Andrew Zisserman. Multiple view geometry in computer vision. Cambridge university press, 2003.
4. Deep Learning by Ian Goodfellow, Yoshua Bengio, and Aaron Courville (<https://www.deeplearningbook.org/>)
5. Richard Sutton and Andrew Barto. Reinforcement Learning: An Introduction. MIT Press.
6. Russell, S. J. (2010). Artificial intelligence a modern approach. Pearson Education, Inc.
7. The Principles of Deep Learning Theory (<https://arxiv.org/abs/2106.10165>)
8. Matrix math for deep learning: <https://explained.ai/matrix-calculus/index.html>
9. Anaconda: <https://www.anaconda.com/>
10. Python: <https://www.python.org/>
11. Jupyter Notebook: <https://jupyter.org/>
12. PyTorch: <https://pytorch.org/>
13. Several classical and state-of-the-art research papers on machine vision and deep learning will be covered.

Course Schedule: The following is a tentative schedule of the lectures. The schedule is a general plan for the course; any deviations, if necessary, will be announced by the instructor.

Week No.	Topic	Homework Assignment
1	Introduction to machine vision and deep learning in AFS	
2	Camera calibrations for drones and ag robots	
3	Image stitching for ground robots	Assignment 1
4	Logistic regression	
5	Neural networks and training: backpropagation	Assignment 2
6	Convolutional neural networks (CNN)	
7	Model training, batch normalization, optimization	
8	Image classification and object detection	Assignment 3
9	Image segmentation	
10	Recurrent network for sequence data	Project Proposal Due
11	Gated recurrent unit and LSTM	Assignment 4
12	Attention mechanisms & transformer, vision transformer	
13	Reinforcement learning	
14	Journal paper presentation	
15	Project presentation and report	<i>Project Presentation and Final Paper Due</i>

Grading Policy: Course grades will be calculated in accordance with the following:

Percent	Grade	Grade Points
93.5 - 100	A	4.00
89.5 - 93.4	A-	3.67
86.5 - 89.4	B+	3.33
83.5 - 86.4	B	3.00
79.5 - 83.4	B-	2.67
76.5 - 79.4	C+	2.33
73.5 - 76.4	C	2.00
69.5 - 73.4	C-	1.67
66.5 - 69.4	D+	1.33
63.5 - 66.4	D	1.00
59.5 - 63.4	D-	0.67
0 - 59.4	E	0.00

More information on UF grading policy may be found at:

[UF Graduate Catalog](#)
[Grades and Grading Policies](#)

Evaluation of Grades: The grading system includes four assignments and a class project (a paper and an oral presentation).

Assignment1 (Week 3)	10%
Assignment2 (Week 5)	10%
Assignment3 (Week 8)	10%
Assignment4 (Week 11)	10%
Journal paper presentation (Week 14)	10%
Project proposal (Week 10)	10%
Project paper (Week 15)	30%
<u>Project presentation (Week 15)</u>	<u>10%</u>
Total	100%

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Assignments: Each assignment includes programming tasks and a detailed report answering questions in the Assignment Instruction. Four assignments (specific time windows are shown in the Course Schedule section) will cover topics on camera calibration with respect to 3D world coordinates, panoramic image stitching with feature detection and matching, developing deep learning models from multi-linear perceptron to deep convolutional neural networks, and training/running the models on HiPerGator. Assignments will be assigned via CANVAS. Assignments must be turned in to the instructor by the designated date and time (typically in one week after the posting of the assignment). **Late assignments will not be accepted unless they follow the University's Excused absence.**

Journal paper presentation: Students are expected to make at least one presentation of a selected classical and state-of-the-art research paper on machine vision and deep learning in Week 14.

Final Comprehensive Project: Students must choose a project topic that utilizes the tools and concepts explored in the course. This topic can be related to their ongoing research or approved by the instructor. The deliverables of the project will include: a proposal (a selected topic with a detailed outline of the project paper with at least three initial references; due in Week 10), an oral presentation (about 20 minutes) to the class, and a technical paper/report (due in Week 15) that will follow the format of a professional journal. The proposal should include the following information: 1) Who your teammates are, with a (rough) description of each person's role; 2) What the project goals are; and 3) Proposed methods, including techniques from the class. The project can be any topic covered in this course as long as it involves manipulating actual pixels. You can work alone or in teams of up to two people. We will, however, expect that projects done by teams be more ambitious in scope and have a more impressive write-up. The report should be written in the style of a journal article, with an abstract, an introduction, a (brief) review of relevant literature, and descriptions of your methods and results. There are no length requirements, but your report should include all relevant data.

Below is the rubric we will use for grading the report:

- Introduction (10%): Describe the problem you are working on, why it's important, and an overview of your results.
- Related Work (10%): Discuss published work that relates to your project. How is your approach similar or different from others? This section does not have to be absolutely comprehensive.
- Data (10%): Describe the data you are working with for your project. What type of data are they? Where did they come from? How much data are you working with? Did you have to do any preprocessing, filtering, or other special treatment to use these data in your project?
- Methods (30%): Discuss your approach for solving the problems that you set up in the introduction. Why is your approach the right thing to do? Did you consider alternative approaches? You should demonstrate that you have applied ideas and skills built up during the semester to tackling your problem of choice. It's a good idea to include figures, diagrams, or tables to describe your method or compare it with other methods.
- Results (30%): Discuss the experiments that you performed to demonstrate that your approach solves the problem. The exact experiments will vary depending on the project, but you might compare with previously published methods, perform an ablation study to determine the impact of various components of your system, experiment with different hyperparameters or architectural choices, use visualization techniques to gain insight into how your model works, discuss common failure modes of your model, etc. You should include graphs, tables, or other figures to illustrate your experimental results.
- Conclusion (5%): Summarize your key results - what have you learned? Suggest ideas for future extensions or new applications of your ideas.
- Writing / Formatting (5%): Is your paper clearly written and nicely formatted?

AI Student Learning Outcomes (SLOs)

SLO1. Identify, describe, and/or explain the components, requirements, and/or characteristics of AI.

- Addressed by Lectures 1-20
- Assessed by assignments 1-4, journal paper presentations, and final project.

Attendance Policy, Class Expectations, and Make-Up Policy: Students are expected to attend classes and participate in course discussions. Excused absences must be consistent with university policies in the Graduate Catalog (<https://catalog.ufl.edu/graduate/regulations>) and require appropriate documentation. Additional information can be found here: <https://gradcatalog.ufl.edu/graduate/regulations/>

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the

following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- HWCoe Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or
<http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling;
<https://career.ufl.edu>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

On-Line Students Complaints: <https://distance.ufl.edu/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>

Weekly Schedule of Topics

Course: ABE 6165

Designation: AI Designation

Instructor: Changying Li

Week	AI-Related Topic	Number of Contact Hours Related to AI	Details on AI-Related Readings, Projects, and Assignments
1	Introduction to machine vision and deep learning	3	
2	Camera calibrations for drones and ag robots	3	
3	Image stitching for ground robots	3	Assignment 1: on camera calibration and panorama
4	Logistic regression	3	
5	Neural networks and training: backpropagation	3	Assignment 2: on developing a neural network with gradient descent algorithm
6	Convolutional neural networks (CNN)	3	
7	Model training, batch normalization, optimization	3	
8	Image classification and object detection	3	Assignment 3: on developing a CNN neural network for image classification
9	Image segmentation	3	
10	Recurrent network for sequence data	3	Project Proposal Due
11	Gated recurrent unit and LSTM	3	Assignment 4: on recurrent neural network, LSTM, and transformers
12	Attention mechanisms & transformer, vision transformer	3	
13	Reinforcement learning	3	
14	Journal paper presentation	3	Present classic and state of the art deep learning research papers from CVPR and other top AI conferences and journals.
15	Project presentation and report	3	<i>Project Presentation and Final Paper Due</i>

Cover Sheet: Request 23055

FNR 6560 Introduction to Bayesian Statistics in Life Sciences

Info

Process	Course Add to Existinggrad AI
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Denis Valle drvalle@ufl.edu
Created	7/9/2026 7:19:12 PM
Updated	8/31/2026 12:52:46 PM
Description of request	I would like this to be a AI-Designated course

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Forest Resources and Conservation 60460000	Terrell Baker III		8/31/2026
FNR-6560---Intro-to-Bayesian-Statistics-in-Life-Sciences-Syllabus-(Face-to-Face-and-Online).pdf					7/9/2026
College	Pending	CALS - College of Agricultural and Life Sciences			8/31/2026
No document changes					
AI Curriculum Committee					
No document changes					
Graduate Curriculum Committee					
No document changes					
Office of the Registrar					
No document changes					
Graduate Catalog					
No document changes					
College Notified					
No document changes					

Existing AI Course (without changes) for request 23055

Info

Request: FNR 6560 Introduction to Bayesian Statistics in Life Sciences

Description of request: I would like this to be a AI-Designated course

Submitter: Denis Valle drvalle@ufl.edu

Created: 7/9/2026 7:06:44 PM

Form version: 1

Responses

Canvas Availability Yes, I acknowledge this requirement.

Assessment Data Yes, I acknowledge this requirement.

Weekly Schedule and Assignments Yes, I acknowledge this requirement.

Course Prefix and Number FNR6560

Course Title Introduction to Bayesian Statistics in Life Sciences

Lab Code C

Delivery Method PD - Primarily Distance Learning (80-99% of course content taught outside of classroom)

Effective Term Spring

Effective Year Earliest Available

Credit Hours 3

Prerequisites N/A

AI Percentile Designation This course contains greater than 10% and less than 50% AI-related content.

Requested AI Categories (10%-50%) Enable-AI: AI Enabled

SLO Statement Requirement I understand and agree to include the required statements in the course syllabus.

Rationale for the AI Category This course talks about key statistical concepts such as pdf, pmf, joint, marginal, conditional probabilities, linear models, random effects, regularization, uncertainty quantification, sources of uncertainty

Course Description Bayesian statistics have been extensively adopted and used in multiple scientific fields due to the flexibility of the models that can be created in this framework.

The aim of the course is to introduce life scientists to Bayesian statistics. We will explore basic ideas regarding integration through simulation (Monte Carlo integration), the philosophy and strengths of Bayesian statistics, and the Markov Chain Monte Carlo (MCMC) algorithms needed to fit such models. We will focus on several real-world examples and how to transform these problems into statistical models. This course will rely on substantial extra-class work, in order to provide students with extensive hands on experience on conceptualizing, implementing, and interpreting the results of these models.

Course Objectives At the end of this course, each student will be able to:

- Solve real problems: think through a problem and how to translate that into a biologically sensible statistical model (instead of pre-built standard models).
- Summarize and interpret MCMC output.
- Implement Bayesian models in JAGS.

Instructor(s) Denis Ribeiro do Valle

Required Links and Policies Yes

Introduction to Bayesian Statistics in Life Sciences- FNR 6560

1 Overview

Instructor: Denis Valle, 408 McCarty Hall C, 352-392-3806, drvalle@ufl.edu

- Please use the Canvas message/Inbox feature for fastest response.
- Office hours: Tuesdays right after class.

Teaching Assistant: Henrique Shirai, henrique.shirai@ufl.edu.

- Please use the Canvas message/Inbox feature for fastest response.

Semester, time and location: Spring semester, period 5 (11:45 am - 12:35 pm) on Tuesdays and periods 4-5 (10:40 am - 12:35 pm) on Thursdays. This will be **online synchronous** course, which means that students are expected to participate through zoom during these days and times. **Note:** We will have an in-person activity on **Tuesday (April 23)** that will be worth 2% of the overall grade for the semester.

Credits: 3

Bayesian statistics have been extensively adopted and used in multiple scientific fields due to the flexibility of the models that can be created in this framework. In particular, the Bayesian framework has enabled modelers to create customized models to tackle large and complex statistical problems that often times cannot be dealt with in a frequentist setting. Finally, Bayesian model results have a much more straight-forward interpretation than their frequentist counterparts.

The aim of the course is to introduce life scientists to Bayesian statistics. We will explore basic ideas regarding integration through simulation (Monte Carlo integration), the philosophy and strengths of Bayesian statistics, and the Markov Chain Monte Carlo (MCMC) algorithms needed to fit such models. We will focus on several real-world examples and how to transform these problems into statistical models. This course will rely on substantial extra-class work, in order to provide students with extensive hands on experience on conceptualizing, implementing, and interpreting the results of these models. Ideally, this experience will be enough to enable students to develop their own Bayesian models after this course is over. We will try to cover simple, mixed effect and multi-level regression models but this will fundamentally depend on the speed with which the class is able to follow the course. Implementation of these models will be done both with JAGS as well as customized R code.

Textbook(s) and/or readings: There is no required text for the course. Readings will be provided for each learning topic as listed in section 5, Readings.

Required software:

- R, freely available at <http://www.r-project.org>

- JAGS, freely available at <http://mcmc-jags.sourceforge.net/>
- A text editor, such as RStudio (<http://www.rstudio.com/>)

Course Prerequisites: none

- Conceptual understanding of integrals
- The student should be comfortable with the following programming skills:
 - creating and manipulating vectors and matrices,
 - creating loops and your own functions,
 - creating queries using Boolean logic
- STA6166, STA6093, or a similar introductory statistics course are highly recommended.
- It is highly recommended for students to have had a previous course on mathematical statistics, such as:
 - “ZOO6927 Statistical Principles for the Biological Sciences” by Jose Ponciano;
 - “STA 5325 Fundamentals of Probability”; or
 - “Foundations of Probability & Math Statistics: a scientific computing approach” by Nikolay Bliznyuk

2 Learning Outcomes

At the end of this course, each student will be able to:

- Solve real problems: think through a problem and how to translate that into a biologically sensible statistical model (instead of pre-built standard models).
- Interpret MCMC output.
- Implement Bayesian models in JAGS.
- Read and modify R code that implements a Gibbs sampler from scratch.

3 Course Logistics

My philosophy is that you learn best by doing, thus this course is heavily based on extra-class work and reading.

Technology Requirements in addition to software:

- A computer or mobile device with high-speed internet connection.
- A headset and/or microphone and speakers; a web cam is suggested.
- Latest version of web browser. Canvas supports only the two most recent versions of any given browser.

3.1 Assignments & Deliverables

Participation

I expect students to read the lecture notes and watch the recorded lectures (if available) before-hand and actively participate during class.

Weekly Assignments

Weekly assignments should be handed-in as word or pdf documents, basically showing how you solved the different problems (include your commented code) and the final results, together with their interpretation. All assignments are graded from 0 to 1 and the overall grade for these assignments is the arithmetic average of all grades. I will provide my answers/code to solve the assignments with the goal of helping students identify and correct the mistakes they have made.

3.2 Grades & Grading Scale

80% Weekly Assignments (individual problem set & group work)

18% Participation

2% In-person activity at the end of the semester

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Grading Scale (%)

A	90-100
A-	86.7-89.9
B+	83.3-86.6
B	80-83.2
B-	76.7-79.9
C+	73.3-76.6
C	70-73.2
C-	66.7-69.9
D+	63.3-66.6
D	60-63.2
D-	56.7-59.9

4 Course Content

A tentative schedule of topics to be covered in each week is given below:

Week	Topic
1	Intro. frequentist and Bayesian statistics Review: Joint, conditional and marginal probabilities; law of total probability; Bayes theorem
2	Review: Likelihood, pmf/pdf and their characteristics (e.g., moments), MLE
3	Conjugate likelihood-prior pairs: simple examples
4	Monte Carlo integration
5	Gibbs sampling and full conditionals
6	Introduction to conceptual (generative) models / generating fake data Inverse modeling
7	JAGS and linear models
8	Estimating population size from mark-recapture data
9	Metropolis-Hastings algorithm
10	Predictive distribution and sources of uncertainty
11	Linear robust regression
12	Models with latent variables
13	Multilevel models
14	Common problems in JAGS (bad initial values and identifiability issues)

5 Reading List

Textbooks (Not required): sections of these books will be used and will be made available when needed to registered students.

- P. D. Hoff. 2009. A first course in Bayesian statistical methods. Series: Springer Texts in Statistics. Chapters 1 (Introduction and Examples) and 9 (Linear regression).
- Michael A. McCarthy. 2007. Bayesian methods for ecology. Cambridge University Press. Chapters 1 (Introduction), 2 (Critiques of statistical methods), and 5 (Regression and correlation).
- Andrew Gelman and Jennifer Hill. 2007. Data analysis using regression and multilevel / hierarchical models. Cambridge University Press. Chapters 8 (Simulation for checking statistical procedures and model fits) and 12 (Multilevel linear models: the basics)
- Allen B. Downey. 2012. Think Bayes: Bayesian statistics made simple. Green Tea Press (available at <http://www.greenteapress.com/thinkbayes/>). Chapter 1 (Bayes' theorem)
- Benjamin Bolker. 2008. Ecological models and data in R. Princeton University Press. Chapter 4 (Probability and stochastic distributions for ecological modeling)
- Robert Winkler. 2003. An Introduction to Bayesian inference and decision. Probabilistic publishing. Chapter 2 (Probability: measuring uncertainty)

6 Policies and Requirements

This syllabus represents current plans and objectives for this course. As the semester progresses, changes may need to be made to accommodate timing, logistics, or to enhance learning. Such changes, communicated clearly, are not unusual and should be expected.

6.1 Late Submissions & Make-up Requests

Computer or other hardware failures, except failure of the UF e-Learning system, will not excuse students for missing assignments. Any late submissions due to technical issues **MUST** be accompanied by the ticket number received from the Helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You **MUST** e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration.

For computer, software compatibility, or access problems call the HELP DESK phone number—352-392-HELP = 352- 392-4357 (option 2).

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

6.2 Semester Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning.

At approximately the mid-point of the semester, the School of Forest Resources & Conservation will request anonymous feedback on student satisfaction on various aspects of this course. These surveys will be sent out through Canvas and are not required, but encouraged. This is not the UF Faculty Evaluation!

At the end of the semester, students are expected to provide UF with feedback on the quality of instruction in this course using a standard set of university and college criteria (UF Faculty Evaluations).

These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

6.3 Netiquette: Communication Courtesy

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. Failure to do so may result in loss of participation points and/or referral to the Dean of Students' Office. <http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>

6.4 Academic Honesty Policy

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."*

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct or appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated.

Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

6.5 Inclusive Learning Environment

This course embraces the University of Florida's Non-Discrimination Policy, which reads,

The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act.

If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see the instructor or refer to the Office of Multicultural & Diversity Affairs website: <http://multicultural.ufl.edu>.

6.6 Services for Students with Disabilities:

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

6.7 Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

7 Campus Helping Resources

For issues with technical difficulties for e-learning in Canvas, please post your question to the Technical Help Discussion in your course, or contact the UF Help Desk at:

- Learning-support@ufl.edu | (352) 392-HELP - select option 2 | <http://elearning.ufl.edu>
- Library Help Desk support <http://cms.uflib.ufl.edu/ask>
- SFRC Academic Hub <https://ufl.instructure.com/courses/303721>

7.1 Student Life, Wellness, and Counseling Help

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- Counseling and Wellness resources <http://www.counseling.ufl.edu/cwc/>
- U Matter, We Care <http://www.umatter.ufl.edu/>
- Career Connections Center <http://career.ufl.edu/>
- Other resources are available at <http://www.distance.ufl.edu/getting-help> for online students.

7.2 Student Complaint Process

The School of Forest Resources & Conservation cares about your experience and we will make every effort to address course concerns. We request that all of our online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered.

If you have a more urgent concern, your first point of contact should be the SFRC Academic Coordinator or the Graduate/Undergraduate Coordinator for the program offering the course. You may also submit a complaint directly to UF administration:

- Students in online courses: <http://www.distance.ufl.edu/student-complaint-process>

- Students in face-to-face courses: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

Cover Sheet: Request 23066

Request AI Designation for HOS5330

Info

Process	Course Add to Existinggrad AI
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Steven Sargent sasa@ufl.edu
Created	7/16/2026 1:34:13 PM
Updated	8/31/2026 2:28:54 PM
Description of request	This annual, graduate-level course has been offered for more than 40 years. Each year, the instructors update the syllabus and course materials to align with new technical information, cutting-edge classroom techniques, varied field trip visits, etc. In Spring 2025, an AI module was introduced with the goal to provide the students with sufficient background information to implement AI in developing their main assignment, that of writing a technical report based on a specific topic of their choice and on field trip observations. The invited instructor is an expert in use of AI in the classroom and presents specific examples of AI applications and provides links to UF resources.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Horticultural Sciences 60230000	Christopher Gunter		8/31/2026
HOS 5330 - Syllabus Only.Spring 2027 Draft.Modified for AI category.docx					8/31/2026
College	Pending	CALS - College of Agricultural and Life Sciences			8/31/2026
No document changes					
AI Curriculum Committee					
No document changes					
Graduate Curriculum Committee					
No document changes					
Office of the Registrar					
No document changes					
Graduate Catalog					
No document changes					
College Notified					
No document changes					

Existing AI Course (without changes) for request 23066

Info

Request: Request AI Designation for HOS5330

Description of request: This annual, graduate-level course has been offered for more than 40 years. Each year, the instructors update the syllabus and course materials to align with new technical information, cutting-edge classroom techniques, varied field trip visits, etc. In Spring 2025, an AI module was introduced with the goal to provide the students with sufficient background information to implement AI in developing their main assignment, that of writing a technical report based on a specific topic of their choice and on field trip observations. The invited instructor is an expert in use of AI in the classroom and presents specific examples of AI applications and provides links to UF resources.

Submitter: Steven Sargent sasa@ufl.edu

Created: 7/15/2026 3:49:34 PM

Form version: 1

Responses

Canvas Availability Yes, I acknowledge this requirement.

Assessment Data Yes, I acknowledge this requirement.

Weekly Schedule and Assignments Yes, I acknowledge this requirement.

Course Prefix and Number HOS5330

Course Title Postharvest Technologies for Horticultural Crops

Lab Code C

Delivery Method HB - Hybrid Blend (50-79% of course content taught outside of classroom)

Effective Term Spring

Effective Year 2027

Credit Hours 2

Prerequisites None

AI Percentile Designation This course contains greater than 10% and less than 50% AI-related content.

Requested AI Categories (10%-50%) Enable-AI: AI Enabled

SLO Statement Requirement I understand and agree to include the required statements in the course syllabus.

Rationale for the AI Category An AI module was first introduced to this annual graduate course in Spring 2025. The goal is to provide the students with sufficient background information to use AI in developing their main assignment, that of writing a technical report based on a specific topic of their choice. The invited instructor is an expert in use of AI in the classroom and presented specific examples of AI applications and provided links to UF resources.

Course Description Intensive study of current technologies and procedures to maintain quality and reduce losses of fresh fruit, vegetable, and ornamental crops grown in Florida, from harvest through handling and shipping operations.

Course Objectives 1) To familiarize students with the current commercial methods used to harvest, pack, transport and market fresh horticultural crops, with emphasis on maintaining product quality and safety.

2) To prepare students to systematically evaluate and critically analyze these operations based on prior in-class lectures, invited speakers, course assignments, and the application of UF-approved AI resources.

Instructor(s) Steven A. Sargent; Mark A. Ritenour

Required Links and Policies Yes

Postharvest Technologies for Horticultural Crops ***HOS 5330***

Thursdays, Periods 9 & 10 (4:05 – 5:55 PM, Eastern Time)
1306 Fifield Hall (section 0101) and via Zoom Meeting

Spring 2027 Course Syllabus

Instructors

Steven A. Sargent, Ph.D.
Professor

Office

Horticultural Sciences Department
1211 Fifield Hall
sasa@ufl.edu

Mark A. Ritenour, Ph.D.
Professor

Indian River Research & Education Center
Ft. Pierce
ritenour@ufl.edu

Office Hours – Sargent and Ritenour:

Thursdays 3:00-3:30 PM on class days and by appointment.

Course Technical Assistant: Adrian Berry, M.S. (adberry@ufl.edu)

Catalog Description

Prerequisite:

HOS 5085 suggested. Open to graduate students (upper-division undergraduate students with instructor consent).

Description:

Intensive study of current technologies and procedures for harvesting and handling fresh fruit, vegetable, and ornamental crops grown in Florida.

Course Learning Objectives

- 1) To provide students with first-hand experience of the current commercial methods used to harvest, pack, transport and market fresh horticultural crops grown in Florida, with emphasis on maintaining product quality and safety.
- 2) To prepare students to systematically evaluate and critically analyze these operations based on prior in-class lectures and the application of UF-approved AI resources to course assignments.

Course Format, Expectations and Evaluation

The class will meet weekly prior to a required, 5-day field trip to north and south Florida during Spring Break. Students will self-divide into interdisciplinary teams and will work together on assignments designed to meet the course learning objectives.

Class website: <http://irrec.ifas.ufl.edu/postharvest/HOS5330.shtml>

Lecture Topics and Field Trips:

1. Postharvest Losses; Introduction to Systems Analysis
2. Using AI Resources at UF
3. Postharvest Physiology for Horticultural Crops
4. Harvest and Handling Operations; Temperature Management

5. Sanitation and Food Safety
6. Storage and Shipping Operations; Postharvest Treatments
7. Field trip to local supermarket produce department
8. Spring Break field trip
9. In-class review/discussion of field trip
10. In-class presentations of technical report

Course grading:

- Course Notes Journal: Students will maintain a written record of pertinent information presented on the field trip. This will include a description of the operation, crops, handling methods, and their impacts on quality. Following the field trip, each team will assemble their team members' field trip notes and organize them into a written journal (MS Word format) that collates team members' field trip observations in a neatly organized and illustrated manner. (30% of grade)
- Technical Report: Each team will develop and write a technical report (MS Word format) on a predetermined technology using examples and details observed during the field trip and pertinent literature. The goal of the technical report is to describe how fresh produce quality is maintained (or lost) by the appropriate use (and misuse) of the selected technology. Use and interpretation of AI will be an integral component of development of the report (40% of grade)
- PowerPoint Presentation: Each team will present their technical report to the class via a 15-minute PowerPoint presentation. (30% of grade)
- Participation in in-class discussions, field trip visits and group assignments, and is critical to successful completion of this course.

All assignments will be returned at the end of the semester.

Required Text (free online download)

U.S. Dept. of Agriculture Handbook 66. 2016. The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks. K.C. Gross, C.Y Wang and M. Saltveit (Eds.).

https://irrec.ifas.ufl.edu/postharvest/HOS_5085C/Reading%20Assignments/USDA%20HANDBOOK%2066.pdf

Recommended Reference Text

Kader, A.A. (Ed.). 2002. Postharvest Technology of Horticultural Crops. Third Edition. Publication 3311. University of California, Division of Agriculture and Natural Resources. Oakland CA.

Supplemental materials are accessible on the course website; others will be provided by the instructors as necessary.

Zoom Link for Off-Campus Students

To be added later.

Grading, Academic Honesty, Software Use, UF Counseling Services and Services for Students with Disabilities

Graduate Academic Regulations

Use this link to access guidelines for UF graduate students.

<https://gradcatalog.ufl.edu/graduate/regulations/>

Grades and Grade Points

For information on current UF policies for assigning grade points, see

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Attendance. Absences and Make-Up Work

Class attendance and field trip participation are required. University policies can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Online Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see:

<https://sccr.dso.ufl.edu/students/student-conduct-code/>

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center

provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, <https://counseling.ufl.edu/>
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Training Programs
 - Community Provider Database
- Career Resource Center, First Floor JWRU, 392-1601, <https://career.ufl.edu/>

Services for Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu/>

Cover Sheet: Request 22736

SUR4380 REMOTE SENSING (KNOW-AI)

Info

Process	Course Add to ExistingUgrad AI
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Jenna Molen jenna.molen@ufl.edu
Created	3/19/2026 2:59:46 PM
Updated	8/31/2026 12:52:17 PM
Description of request	Approval flow for AI Course Designations Faculty members can request AI course designations, which will be processed through the following approval stages: Department approval College approval AI Education Committee (AI-Ed) approval If the request is solely for adding an AI designation without new curricular content, it is recommended by the AI Education Committee to bypass the departmental and college curriculum committees. However, if a new course with an AI designation is proposed, the standard curriculum approval process must be followed. Faculty/Departments can create their own submissions, but AI² Center staff is actively identifying courses and creating the submissions for departments to consider. For departmental approval, it is suggested to assign a designated person (such as the chair of the department curriculum committee or the associate chair for academics) to review and approve the proposal for completeness and appropriateness. Similarly, at the college level, this role could be filled by the chair of the college curriculum committee or an associate dean of academics.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Forest Resources and Conservation 60460000	Terrell Baker III		8/31/2026
Broadbent Remote Sensing Weekly Schedule of Topics for AI Designation.docx					3/19/2026
Remote Sensing syllabus 011326 v15.docx					3/19/2026
College	Pending	CALS - College of Agricultural and Life Sciences			8/31/2026
No document changes					
AI Curriculum Committee					
No document changes					
Office of the Registrar					
No document changes					
Catalog					
No document changes					
Student Academic Support System					
No document changes					

Step	Status	Group	User	Comment	Updated
College Notified					
No document changes					

Existing AI Course (without changes) for request 22736

Info

Request: SUR4380 REMOTE SENSING (KNOW-AI)

Description of request: Approval flow for AI Course Designations

Faculty members can request AI course designations, which will be processed through the following approval stages:

Department approval

College approval

AI Education Committee (AI-Ed) approval

If the request is solely for adding an AI designation without new curricular content, it is recommended by the AI Education Committee to bypass the departmental and college curriculum committees.

However, if a new course with an AI designation is proposed, the standard curriculum approval process must be followed.

Faculty/Departments can create their own submissions, but AI² Center staff is actively identifying courses and creating the submissions for departments to consider.

For departmental approval, it is suggested to assign a designated person (such as the chair of the department curriculum committee or the associate chair for academics) to review and approve the proposal for completeness and appropriateness. Similarly, at the college level, this role could be filled by the chair of the college curriculum committee or an associate dean of academics.

Submitter: Jenna Molen jenna.molen@ufl.edu

Created: 3/19/2026 2:53:51 PM

Form version: 1

Responses

Canvas Availability Yes, I acknowledge this requirement.

Assessment Data Yes, I acknowledge this requirement.

Weekly Schedule and Assignments Yes, I acknowledge this requirement.

Course Prefix and Number SUR4380

Course Title REMOTE SENSING

Lab Code None

Delivery Method AD - All Distance Learning (100% of course content taught outside of classroom)

Effective Term Earliest Available

Effective Year Earliest Available

Credit Hours 3

Prerequisites NONE

AI Percentile Designation This course contains 50% or greater AI-related content and/or assignments.

Requested AI Categories Know-AI: Know and Understand AI

SLO Statement Requirement I understand and agree to include the required statements in the course syllabus.

Rationale for the AI Category The goal of this course is to provide students with an understanding of the scientific and engineering principles behind remote sensing and to provide an understanding of the state-of-the-art of remote sensing.

Course Description Remote sensing systems, ground truthing, image classification systems, mapping applications, applications in plant and animal science, urban planning, engineering, geology, and integration into geographic information systems.

Course Objectives (1) Provide an understanding of the principles of electromagnetic radiation pertaining to remote sensing. (2) Provide an understanding of instruments currently used in remote sensing and their appropriate application. (3) Demonstrate computer hardware and software used in remote sensing.

Instructor(s) EBEN BROADBENT

Required Links and Policies Yes

Weekly Schedule of Topics

Course: SUR4380

Designation: AI

Instructor: Eben Broadbent (eben@ufl.edu)

Week	AI-Related Topic	Number of Contact Hours Related to AI	Details on AI-Related Readings, Projects, and Assignments
1	Remote sensing	3	Lillesand; Jones; ENVI; ArcGIS; Others
2	Flight platforms	3	“
3	Sensors	3	“
4	EM radiation	3	“
5	Multi-spectral sensors	3	“
6	Hyper-spectral sensors	3	“
7	Image classification	3	“
8	Thermal imagery	3	“
9	Overview	3	“
10	Radar	3	“
11	Radar	3	“
12	Lidar	3	“
13	Segmentation	3	“
14	Cloud	3	“
15	Overview	3	“

SUR4380 REMOTE SENSING – SYLLABUS

Online Asynchronous (3-credits)



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INSTRUCTOR

Dr. Eben N. Broadbent, <https://ffgs.ifas.ufl.edu/faculty/broadbent-eben/>

Spatial Ecology & Conservation Lab, www.speclab.org
303 Reed Lab, School of Forest Resources and Conservation
Mobile: 1-650-204-1051 (text or call as necessary).

Email: Please use Canvas mail as general emails may get lost in my other correspondence, but if needed, for some reason, it is eben@ufl.edu. Also, if needed, my cell is: 1-650-204-1051.

OFFICE HOURS

Tuesdays, 10:30 am – 12:30 pm, and via special appointment. I will be in-person in my office during this time and, by appointment (email, phone call), can be logged into a Zoom session with a waiting room for a virtual appointment. Most efficient is to email me via Canvas in advance to schedule an appointment to ensure you have a spot and that I am available with the Zoom room available. In addition, there will be periodic Zoom sessions scheduled on Tuesday's at 2 PM depending on student interest.

Office hours are available both in-person and virtually. Please schedule a virtual appointment with me during this time or another time if needed, and I will provide a Zoom link and password.

In-person location: 303 Reed Lab; see the Google Map link below for the approximate location:

<https://www.google.com/maps/dir//29.6480108,-82.3480838/@29.6480842,-82.3473972,19z>

Figure: A 3D view of Dr. Broadbent's office (blue star) and two entrances (red arrows) to access the '3rd' floor. The office door is directly across from the Geomatics administrator's main office.



COURSE DESCRIPTION

The goal of this course is to provide students with an understanding of the scientific and engineering principles behind remote sensing and of the current state of the art in the field. Topics include remote sensing systems, ground-truthing procedures, air photo interpretation, satellite image processing and classification, radar imagery, lidar, satellite-, aircraft-, and drone-borne platforms, cloud-based computing for remote sensing, applications of remotely sensed imagery, and integration with geographic information systems.

The approach is based on lecture materials, lecture and lab style activities, and assessments through in-class polls, quizzes, assignments and projects, and with assigned readings providing

support to lecture and activities by covering topics in more detail. KEY to success in this course is understanding that the successful application of remote sensing requires understanding concepts and theories, but also a general overview of a suite of key software packages used for remote sensing analyses. An important part of the experience is solving issues with software and associated datasets, and use of new format and potentially large size datasets (with associated issues related to internet access and storage), as is typical of all remote sensing activities. Consider these challenges as an integral component of Remote Sensing and a part of what you will learn in this course.

In some cases, assignments provide detailed workflows, in others, there may be no specified objective, but rather to learn through creatively applying your knowledge and skills to explore a range of datasets, software features, and potential applications. Working with remote sensing and geospatial data is a constant process of problem-solving, self-learning, and key is having a positive and professional behavior and attitude and using adaptation during the process - and that is part of what I look forward to seeing all students do in this class.

Course Prerequisites: As provided by registrar.

COURSE LEARNING OBJECTIVES

GOAL & OBJECTIVES

Goal:

The goal of this course is to provide students with an understanding of the scientific and engineering principles behind remote sensing and to provide an understanding of the state-of-the-art of remote sensing.

Objectives of Course:

(1) Provide an understanding of the principles of electromagnetic radiation pertaining to remote sensing. (2) Provide an understanding of instruments currently used in remote sensing and their appropriate application. (3) Demonstrate computer hardware and software used in remote sensing.

Topics:

Overall: The course covers remote sensing systems, ground-truthing procedures, air photo interpretation, and satellite image processing and classification. It also addresses radar imagery, applications of remotely sensed data, and integration with geographic information systems.

Specifically: A comprehensive overview of flight platforms, from space-based systems such as satellites and the space station, high-altitude platforms including balloons, aircraft platforms

including fixed-wing and copter systems, drone platforms including fixed-wing, VTOL, and copter configurations, and terrestrial platforms, such as tripods or cranes.

Passive remote sensing will be covered starting with the fundamentals of the electromagnetic spectrum, including energy sources and radiation principles, energy interactions in the atmosphere, and energy interactions with the Earth's surface. Visual imaging as a passive sensing method will be covered through photography, film types (black and white, color, and color infrared), formats and scale for cameras, digital imaging, data formats, and the storage and manipulation of imagery. Applications of photographic results will be explored along with topographic and planimetric mapping, environmental monitoring, and the processing of visual and other imagery, including geometric correction, orthorectification for both satellite and aircraft-borne data, and photogrammetry for satellite and drone-borne systems. The course will also cover applications including, digital elevation models, digital surface models, and multi- and hyperspectral imaging using passive sensors, including platforms, preprocessing, radiometric correction, radiance-to-reflectance conversion, tarps, atmospheric models, in situ sensors, spatial and spectral enhancement, pan-sharpening, and classification methods, including unsupervised approaches.

Classification techniques covered include ISODATA, supervised classification, nearest neighbor classification, and accuracy assessment. Applications of these methods will be emphasized throughout.

The thematic application areas will include vegetation, mineralogy, and thermal remote sensing. This includes thermal infrared imaging, the principles of thermal infrared radiation, radiant versus kinetic temperature, and their applications. These topics will be linked to conservation biology, human presence monitoring, plant health assessment, and fire dynamics.

Active remote sensing will be introduced with a focus on radar and lidar systems. Radar topics will include satellite and aircraft-borne systems, resolution, azimuth, range, terrestrial-borne systems, and ground-penetrating radar. Lidar will be discussed alongside the general applications of active systems, including terrain analysis, pollution detection and monitoring, moisture assessment, target recognition, and data fusion.

Data fusion will be addressed through the integration of active and passive systems, including aircraft-borne, NEON airborne observation platform (AOP), and drone-borne data, with a potential specific case study being the GatorEye Unmanned Flying Laboratory. Image segmentation using eCognition or another segmentation capable software (e.g., ENVI or SAM) will be covered, along with global cloud-based analyses and the use of Google Earth Engine (GEE).

Artificial Intelligence (AI) credit (Enable-AI): Support AI through related knowledge and skill development, such as programming or statistics. AI course content is 10-49%.

LECTURES AND DISCUSSION

- As of 2026, Remote Sensing is being offered in the format of asynchronous online, which best accommodates our upper-level Geomatics students who are frequently engaged in full-time work positions, with challenging schedules, and are located throughout the state.
- To conduct lecture and lab activities, and all other components of the course, all students are required to attend on a computer (PC or laptop) in a location with sufficient internet bandwidth and with webcam and microphone available as is needed to complete assignments and activities during presentations, Q&A, and in-class activities.
- When you conduct the course activities, please do so in a location appropriate for video and audio communication as it may be required to record small videos or post other similar responses. During optional synchronous sessions the expectation is that unless good reason exists you will have your camera on and be able to respond to questions and interact with other participants.
- Students are expected to fully view all lectures and overviews, engage in all class components, discussions, projects, and activities, and carefully complete all required Zoom polls and submissions by the deadlines posted in Canvas. Students are responsible for checking Canvas email regularly and communicating with the instructor promptly with any questions or support needs.

SCHEDULE

See the latest version of the course schedule under the Canvas 'Pages' section (link here). Exam dates and due dates are provided in this schedule, as well as are posted and updated in the Canvas calendar section. The week's **module content for the following week is released each Tuesday at 2 pm on Canvas**. Complete watching all lecture recordings and lecture and lab activities prior to the subsequent Tuesday, unless the deadline is otherwise indicated on Canvas. The schedule is updated frequently, so be sure to check it every Tuesday to ensure you view the correct recordings and complete the assigned activities.

The PC Lab in Reed Lab is available as is needed for students, specifically we have it **reserved from 2-5 PM every Tuesday**. That is on the 4th floor of Reed Lab (see directions in my office hours description above) and has a number of sufficiently powerful PCs with monitors and internet access as is necessary to complete course activities.

INSTRUCTOR INTERACTION PLAN

In addition to office hours, **a course Zoom room will be available to students every Tuesday from 2–5 PM**. The instructor, Dr. Eben Broadbent, intends to be available in the Zoom room at 2:00 pm for many sessions, contingent on student interest. If no students are present at that time, the instructor will log off, but the Zoom room will remain open for student use. On some occasions, the instructor may not be available during this period.

This time may be used to discuss course materials, activities, hardware or software issues, or any other matters related to the course. Meetings may take place in the main Zoom room, in a private Zoom breakout room, or in another format as preferred. Students who specifically wish to ensure meeting with the instructor are encouraged to send a message via Canvas email in advance to help ensure availability. The Zoom room may also be used by students for peer discussion and collaboration as needed.

To attend an optional Zoom meeting, please **register in advance** for the course Zoom meetings (link below). Please use your full name in this process. After registering, you will receive a confirmation email containing information about joining the meeting. You must register using your UFL email. You can also find the links for the Zoom sessions in the Canvas course under the Zoom page.

Registration link: <https://ufl.zoom.us/meeting/register/h1o6IHQMOKn1sHK55K2Q>

Meeting ID: 924 0835 4855

Zoom passcode: 004520

COURSE MATERIALS

Assigned readings are listed on the most current Schedule page in Canvas. These readings are intended to be completed prior to viewing the associated lectures and course materials. Students are expected to review the assigned content to become familiar with the topics and concepts being introduced; however, memorization or full mastery of all details is not required, such as such as complex equations or highly specialized content that may be encountered in the readings.

Textbooks (required): (1) Remote Sensing and Image Interpretation by Lillesand, Kiefer, and Chipman, 7th Edition, 2015. Wiley, and Sons. ISBN: 9781118343289. (2) Remote sensing of vegetation: Principles, techniques, and applications by Jones & Vaughan. 1st Edition, 2010. Oxford University Press. ISBN:9780199207794.

Textbooks (optional): (1) Remote Sensing: Principles, Interpretation, and Applications, by Sabins & Ellis. 4th edition, 2020.

Course website: In Canvas.

Software: Access to ENVI and ArcGIS software is required for this course. ENVI can be accessed by purchasing a student ENVI license or using the UFApps at: <https://info.apps.ufl.edu/>, and it can be accessed from any computer using VPN or on-campus directly, using your UFL login information. A free student version of ArcGIS can be obtained at the following link <https://www.geoplan.ufl.edu/software/> or via UFApps as described above. If you decide to purchase a license for use on your personal computer, then you can do so at the following link. If you decide to do this, let me know, and they have changed their system recently. <https://www.nv5geospatialsoftware.com/Solutions/Academic>

Download and installation of required software packages and datasets, and efficient access to UF resources (including Apps), are required for this course. Please be prepared to do so, including, if required, accessing computer resources on the UF campus and/or the Geomatics computer lab (contact me if you don't have and would like access, and I will make this happen).

Canvas will describe additional requirements and how to enable them as they become necessary, including access to the campus R drive, Google enabling your UFL email for use of Google Docs in assignments, and other items.

GRADE EVALUATION / ASSESSMENTS

Each of the assignments will be evaluated as part of the course grade; please manage your time wisely. **The overall grade will be based on the weighted activities indicated below:**

Activity	Grade weight (%)
Lecture questions and activities	25%
Lecture projects	25%
Midterm and Final exams	30%
Independent projects and presentations	20%
TOTAL	100%

Excellent submissions of any assignment may be used as reference examples for current and future remote sensing courses and shared with students on the Canvas course page.

Lecture questions and activities: This includes polls which will be asked during lectures, and which may take the form of true/false, multiple choice, short response, or otherwise. In addition, the instructor may use other graded forms to assess understanding and participation.

Lecture projects: Start during the lecture period and may extend in some cases outside the lecture period as you require. You will work on various tasks involving data acquisition, understanding, theory, analysis, applications, etc., and with delivery via assigned uploading and/or sharing of recorded presentations. There may be a number of these during each lecture period related to various topics thematically related to the topics being discussed.

Midterm / Final exams: Typically takes less than 60 minutes, has between 30 to 60 questions (true/false, multiple choice, short response), and is conducted using Honor Lock and require a web cam and suitable setting to meet Honor Lock requirements. These are closed-book exams (e.g., no internet, no notes, no book) – meaning nothing but your memory.

Independent projects and presentations: Working during within and outside lecture periods as needed, you will work to develop a study using remote sensing data and theory, the methods, implement the methods, and then present (5 minutes) to the class via submission of a recorded Zoom presentation, your results using a standard format PPT or Google Slide presentation, with key sections being: title, introduction, question/hypothesis, methods, results, discussion,

conclusions - and with a least one map, table, and additional figure, as well as at least three peer-reviewed article citations/references (as found on Google Scholar).

Etiquette: Any submissions displaying unprofessional unconstructive behavior may be graded an immediate 0. Unprofessional behavior will result in warnings and may result in a grade of 0 for associated activities. Repeated, unprofessional unconstructive behaviors or submissions may result in the student being removed from the course.

GRADING SCALE

The following grading scale will be used to determine end-of-semester performance. Each of the assignments will be evaluated as part of the course grade; please manage your time wisely.

Letter Grade	Percentage Range
A	93% and above
A-	90% to 92.99%
B+	87% to 89.99%
B	83% to 86.99%
B-	80% to 82.99%
C+	77% to 79.99%
C	73% to 76.99%
C-	70% to 72.99%
D+	67% to 69.99%
D	63% to 66.99%
D-	60% to 62.99%
F	Below 60%

NETIQUETTE

Communication Courtesy: All class members are expected to follow common courtesy rules in all email messages, threaded discussions, and chats.

When communicating online, you should always:

- Treat everyone with respect, even in email or in any other online communication.
- Use clear and concise language.
- Remember that all college-level communication should have correct spelling and grammar.
- Avoid slang terms such as “wassup?” and texting abbreviations such as “u” instead of “you.”
- Use standard fonts such as Times New Roman and use a size 12 or 14 pt. font.

- Avoid using the caps lock feature AS IT CAN BE INTERPRETED AS YELLING.
- Be cautious when using humor or sarcasm, as the tone is sometimes lost in an email or discussion post, and your message might be taken seriously or offensive.
- Be careful with personal information (both yours and others).

When posting on the Discussion Board in your online class, you should:

- Make posts that are on-topic and within the scope of the course material.
- Take your posts seriously and review and edit your posts before sending them.
- Be as brief as possible while still making a thorough comment.
- Always give proper credit when referencing or quoting another source.
- Be sure to read all messages in a thread before replying.
- Don't repeat someone else's post without adding something of your own to it.
- Avoid short, generic replies such as, "I agree." Include why you agree or add to the previous point.
- Always be respectful of others' opinions even when they differ from your own.
- When you disagree with someone, you should express your differing opinion in a respectful, non-critical way.
- Do not make personal or insulting remarks.
- Be open-minded.

LEARNING STRATEGIES

- Save files such as readings/handouts to your own computer so that you can access them later after the course has closed. Courses close about a week after the semester ends, and you will not be able to be "added back" to previous courses in order to study for a final exam or defense.
- Check out the UF Writing Studio (online appointments are available).
- Explore Lynda.com – log in with your gatorlink towards the right on the main eLearning page for free training and tutorials on hundreds of subjects and programs like Excel, Python, Photoshop, AutoCAD, etc.

UF HONOR CODE

As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

The instructors of this course fully support the intent of the above statement and will not tolerate academic dishonesty. We, the members of the University of Florida Community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

All students are expected to follow the University of Florida Honor Code (excerpt above). Read more: <https://sccr.dso.ufl.edu/> (Links to an external site.).

AVOIDING PLAGIARISM

During your academic coursework, you will be expected to use a variety of resources, publications, and references to support your assumptions and conclusions. Failure to attribute credit to your sources is a violation of UF's Honor Code and can carry serious consequences. It is vital that you properly credit and cite your sources in every instance in which you include: direct quotations, ideas from other sources, whether paraphrased or summarized, and/or facts that are not considered common knowledge.

If you use someone else's words, ideas, or even if you simply gather facts, you must give the original source credit. Whenever you are in doubt about a particular item, cite it! This serves an important purpose in addition to preserving academic integrity. Along with your bibliography, it indicates to your reader the extent of your research; it also allows the reader to pursue aspects of your topic on their own.

For specific rules on citation formatting, you should follow the guidelines provided by your individual instructors. For more information about plagiarism and academic honesty, visit the UF Library Guide: [Attribution & Plagiarism](#) (Links to an external site.).

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT

Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>. (Links to an external site.)

UF WRITING STUDIO

A campus resource available for students wanting to become better writers. Students have the opportunity to work one-on-one with a consultant on issues specific to their own particular development. To get more information or schedule an appointment, visit <http://writing.ufl.edu/writing-studio/>. (Links to an external site.)

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, disability.ufl.edu (Links to an external site.)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

U MATTER, WE CARE

The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu. A nighttime and weekend crisis counselor is available by phone at 352-392-1575.

COUNSELING AND WELLNESS

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. Both the Counseling Center and Student Mental Health Services provide confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- University Counseling Center, 301 Peabody Hall, 392-1575, counseling.ufl.edu([Links to an external site.](#))
- Student Mental Health Services, Rm. 245 SHCC, 392-1171, shcc.ufl.edu([Links to an external site.](#))
 - Alcohol and Substance Abuse Program (ASAP)
 - Center for Sexual Assault / Abuse Recovery & Education (CARE)
 - Eating Disorders Program
 - Employee Assistance Program
 - Suicide Prevention Program
- University Police Department: 352-392-1111 or 9-1-1 for emergencies.

Other centers

- [Veterans and Active Duty Military](#)
- Career Resource Center, Reitz Union, 352-392-1601, career development assistance and counseling.

TEACHING EVALUATIONS

The School of Forest Resources & Conservation cares about your experience and we will make every effort to address course concerns. We request that all of our online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered. If you have a more urgent concern, your first point of contact should be our Distance Education Coordinator for the SFRC, Rhiannon Pollard. You may also contact the Graduate or Undergraduate Coordinator for the program offering the course, if you prefer. More information on the University of Florida student complaint process can be found [here](#). ([Links to an external site.](#))

ADDITIONAL RESOURCES & INFORMATION

- Gator1 Card([Links to an external site.](#)) - Distance students can complete the application and get an official UF Gator1 ID card
- SFRC Spring Celebration([Links to an external site.](#)) – Join us at the annual event in Gainesville, FL for networking and fun group activities.

TECHNICAL REQUIREMENTS

- Canvas supports only the two most recent versions of any browser software. Safari, Internet Explorer and Microsoft Edge are not recommended. What browser am I using?
- For this course, you will also need to use Adobe Reader and Microsoft Office or equivalent. Login to Office365 at UF
- You may need a headset microphone and webcam. Lectures are normally live, not downloaded, and require a fast, low-latency, and reliable internet connection. Closed captioning is available on some prerecorded lectures. They can be toggled on/off by clicking the CC button at the bottom of the screen.
- A wired connection may be required for quizzes and exams. If technical issues arise during the exam, you must call the UF Helpdesk for a time-stamped ticket at 352-392-4357.
- If accessing the course on a mobile device, you can download the free Canvas app. Do not use the app for submitting assignments or exams. We do not recommend using the app for viewing recorded lectures and presentations.
- Connecting to UF Library Resources from Off Campus (using Course Reserves / ARES)
 - IMPORTANT: You must have the UF VPN Client installed on your computer and be logged into the UF VPN Client before viewing UF Library eResources or course reserve materials using an off-campus network. For information on installing and using the UF VPN Client, go to How to Install Cisco AnyConnect for UF VPN ([Links to an external site.](#))Links to an external site. For technical assistance with the UF VPN Client, please call the UF Computing Help Desk, at 352-392-4357.

ACADEMIC POLICIES AND RESOURCES

Academic policies for this course are consistent with university policies. See <https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/>

CAMPUS HEALTH AND WELLNESS RESOURCES

Visit <https://one.ufl.edu/whole-gator/topics> for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact [UMatterWeCare](#) for additional and immediate support.

SOFTWARE USE

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

PRIVACY AND ACCESSIBILITY POLICIES

UF Resources: **[Privacy](#)** | **[Accessibility](#)**

Microsoft **[Privacy](#)** | **[Accessibility](#)**

Zoom **[Privacy Statement](#)** | **[Accessibility](#)**

Mediasite **[Privacy Statement](#)** | **[Accessibility](#)**.

Instructure (Canvas) **[Privacy Statement](#)** | **[Accessibility](#)**

Honorlock **[Privacy Statement](#)** | **[Accessibility](#)**

YouTube: **[Privacy](#)**

Cover Sheet: Request 21907

PCB4522 — Molecular Genetics

Info

Process	Modify or Close Course Ugrad (v.2026)
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Tyler Square square.t@ufl.edu
Created	9/17/2025 8:16:44 AM
Updated	9/3/2026 5:34:17 PM
Description of request	Updating the course description (minor changes)

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Microbiology and Cell Science 60100000	Eric Triplett		10/23/2025
No document changes					
College	Recycled	CALS - College of Agricultural and Life Sciences	Anne Mathews	Hi Tyler and Eric - CALS and the UCC require a syllabus to review changes. Please upload a syllabus with the new course description included and the CALS checklist with any needed edits made. Melissa Jones is your representative to the CALS committee and can assist if needed.	11/5/2025
No document changes					
Department	Approved	CALS - Microbiology and Cell Science 60100000	Eric Triplett		6/22/2026
No document changes					
College	Pending	CALS - College of Agricultural and Life Sciences			6/22/2026
No document changes					
University Curriculum Committee					
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Catalog					
No document changes					

Step	Status	Group	User	Comment	Updated
Student Academic Support System					
No document changes					
College Notified					
No document changes					

Modify Course Request (v.2026) for request 21907

Info

Request: PCB4522 — Molecular Genetics

Description of request: Updating the course description (minor changes)

Submitter: Tyler Square square.t@ufl.edu

Created: 9/17/2025 7:58:26 AM

Form version: 1

Responses

Current Prefix PCB

Course Level 4

Number 522

Lab Code None

Course Title Molecular Genetics

Effective Term Earliest Available

Effective Year Earliest Available

Requested Action Other (selecting this option opens additional form fields below)

Change Course Prefix? No

Change Course Level? No

Change Course Number? No

Change Lab Code? No

Change Course Title? No

Change Transcript Title? No

Change Credit Hours? No

Change Variable Credit? No

Change S/U Only? No

Change Contact Type? No

Course Type Lecture

Change Rotating Topic Designation? No

Change Repeatable Credit? No

Multiple Offerings in a Single Semester No

Change Course Description? Yes

Current Course Description Molecular biology of prokaryotes and eukaryotes covering the fundamentals of genome organization and gene structure, regulation of transcription, DNA replication

and repair, and RNA processing. Also includes discussion of strategies, vectors and applications of genetic engineering in higher plants and animals.

Proposed Course Description (500 characters max) Molecular biology of prokaryotes and eukaryotes covering the fundamentals of gene and genome organization, transcription, translation, DNA replication and repair, and RNA processing. Also includes discussion of genetic engineering strategies and modern sequencing technologies.

Change Course Objectives No

Change Prerequisites? No

Change Co-requisites? No

Rationale Editing to 1) include "translation" as a main topic of the class, 2) to remove the term "higher plants and animals" as this is no longer a relevant given that we discuss genome engineering in all organisms, and 3) to add mention of modern sequencing technologies.

CALS Curriculum Committee

Submission Checklist

Updated August 2025

NOTE: This checklist must be included with all course and certificate submissions.

The checklist below is intended to facilitate course and certificate submissions to the University of Florida Academic Approval Tracking System (<https://approval.ufl.edu/>). The checklist consists of the most common items that can cause a submission to require changes or be recycled. Contrary to information provided on the UF approval site, the CALS Curriculum Committee requires a syllabus be submitted with each new course or course modification request. Please note that submitters are encouraged to attend the CALS CC meeting at which their item is being reviewed. This allows the submitter to answer any potential questions that may arise that could cause the item to not be approved. Also, be aware that when completing the UCC form the section Description of Request is asking for a brief statement about what you are doing. This is **not** the place for a course description. A statement such as “Proposal of a new undergraduate course” is all that is needed. Please do not submit documents in pdf format. All documents should be submitted in Word to facilitate editing on our end if necessary.

CHECKLIST: PLEASE INITIAL OR MARK N/A FOR EACH STATEMENT TO INDICATE YOUR COMPLIANCE.

SYLLABUS: You are encouraged to use the [CALS ACCESSIBLE SYLLABUS TEMPLATE](#). Accessibility will be required by APRIL 2026.

✓ It is required when making a submission that you consult your department’s representative to the CALS CC. A list of current members can be found on the committee site located at: <https://cals.ufl.edu/faculty-staff/committees/>.

✓ Submission of a course modification requires both the current version of the course syllabus and the proposed version.

✓ Joint course submissions must include 1) both graduate and undergraduate syllabuses and 2) a separate document outlining the substantial (more than one) differences in assignments between the two courses. These assignments must account for at least a 15% difference in graded material between the two levels. If this is a new course submission both courses must be submitted for approval simultaneously.

✓ The course description on the UCC form and in the syllabus must match and should be no longer than 500 characters. The course description must match the course description in the catalog. Any other information you wish to include needs to be under a different heading such as background or additional course information.

✓ The course learning objectives must be consistent with Bloom’s taxonomy. Please see the following link at the CALS Curriculum site. (https://cals.ufl.edu/content/PDF/Faculty_Staff/cals-courseobjectives.pdf). Do not use the words demonstrate or understand when listing learning objectives.

✓ The course schedule should be concise and include the appropriate number of weeks in the semester.

✓ All graduate course submissions must include a reading list if a textbook is not required. The reading list should include at least some current readings (within the last 5 years). All readings do not need to be current.

✓ Outside consultations are required if there is a possibility of the proposed course covering a significant amount of material taught in another department or college on campus. There must be a consult form completed by the chair of the department from who you are seeking the consult. Instructors may provide additional consults. The form can be found at: <https://approval.ufl.edu/policies/external-consultations/>.

✓ Prerequisite courses are required for 3000 and 4000 level courses. This line of the approval form cannot be “none” or left blank. Junior or senior standing is an acceptable option. A phrase such as “a course in basic biology” is not acceptable. (Graduate courses should not have specific courses listed as prerequisites. If needed a statement of skills required prior to taking the course can be provided under other course information.)

✓ Decimal points must be included in the grading scale if grade cut-offs are based on percentages. While this is not a university policy it is a CALS standard practice to avoid any confusion when final grades for the course are determined.

✓ The attendance and make-up policy in a syllabus cannot contradict the university’s policy. Do not include any additional wording to this policy. A statement and link regarding this are included in the CALS Syllabus Statements. For the approval process the college suggests a less is more view when it comes to this policy.

✓ The most recent version of the UF Syllabus Statements. Using the accessible syllabus template will ensure you have the most up to date statements. Do not use the boilerplate statements from an old syllabus as they are likely to be out of date.

Certificates

If proposing a new undergraduate or graduate level certificate that includes any courses outside of the submitters department a statement regarding any possible impact on those courses needs to be included. An email from the instructor is acceptable. Also, any courses required for the certificate must have permanent prefixes and course numbers. The submission must include intended catalog copy. (Contact Dr. Anne Mathews (anne.mathews@ufl.edu) for further instruction)



PCB 4522 | Molecular Genetics

Fall 2026

Instructor Information

Name: Tyler Square

Course Details

Catalog Description: Molecular biology of prokaryotes and eukaryotes covering the fundamentals of genome organization and gene structure, regulation of transcription, DNA replication and repair, and RNA processing. Also includes discussion of strategies, vectors and applications of genetic engineering in higher plants and animals.

Pre- and Co-Requisites: Prereq: BSC 2010 and BSC 2010L with minimum grades of C.

Credit Hours: 3

Course Fees: \$20.13

Additional Course Description

All known organisms use genetic instructions encoded in DNA. But DNA alone is not enough – an instruction book by itself is useless without a way to read and implement the instructions within. In this course, we will explore the molecular structure of DNA, how genes and genomes are arranged, how DNA is mutated and repaired, and the machinery that is used to transcribe and translate DNA across different major branches of the tree of life, including both eukaryotic and prokaryotic systems.

Recommended Materials

LEWIN'S GENES XII

ISBN: 9781284104493

Authors: KREBS, GOLDSTEIN, AND KILPATRICK

Publisher: JONES & BARTLETT

Edition: 12

Course Goals and Objectives

The main goal of this course is to endow students with a foundational understanding of the molecules involved with the transmission, utilization, and evolution of genetic information. Achieving this goal should empower students to think critically about how molecular genetic processes are connected to and interact with macro-scale processes in other areas of research and everyday life.

Expectations and Student Learning Outcomes

After each module (indicated below), students should be able to:

1. Recall basic aspects of nucleic acid biochemistry (Module I)
2. Predict theoretical experimental outcomes involving nucleic acid biochemistry (Module I)
3. Recall important features of the cell cycle, DNA replication, and DNA repair (Module II)
4. Predict hypothetical outcomes of mutations affecting these processes (Module II)
5. Recall important events, genes, and proteins involved in transcription and translation (Module III)
6. Evaluate hypothetical genetic circuits to predict what functional outcomes they would yield (Module III)
7. Recall how gene regulation works in prokaryotes and eukaryotes (Module IV)
8. Evaluate the outcomes of hypothetical experiments (Module IV)
9. Recall basic features of modern mutagenesis methods and sequencing approaches (Module V)
10. Develop an experimental approach using modern sequencing techniques to test a given hypothesis (Module V)

Methods of Evaluation

Grades in this class will be determined by five exams, ten quizzes, and four homework assignments. The ten quizzes include nine on course subject material (numbered 1-9) and an additional Honorlock/camera setup “quiz.” No items in this class are dropped, and there is a single 1% extra credit opportunity, to be announced midway through the class. Grades are determined as follows:

Graded items	% of grade
Exam I	10
Exam II	15
Exam III	15
Exam IV	15
Exam V	10

Graded items	% of grade
Quizzes (10x)	15
Homework (4x)	20

Grading Scale

Letter grade and percentage	
Letter	Percentage Value
A	93 - 100%
A-	90 - 92.9%
B+	87 - 89.9%
B	83 - 86.9%
B-	80 - 82.9%
C+	77 - 79.9%
C	73 - 76.9%
C-	70 - 72.9%
D+	67 - 69.9%
D	66 - 66.9%
D-	60 - 65.9%
E	59.9% and below

Course Schedule

Lectures: There are 23 content lectures in this class, five for each of the first four modules, and only three lectures for Module V. Most lectures are about one hour long, but some are as short as ~35 min, and others are as long as ~75 minutes. For some, the longer formats may be difficult to get through in a single sitting, so please feel free to press pause and break them up into shorter watching sessions if you feel you would ingest the information better in smaller doses.

Lecture # (suggested date)	Subject material	Suggested reading	Due dates for exams, quizzes, and homework
Module I: meet the molecules (nucleic acids, genomes, and methods)			
Lecture 1 (~08/20)	Course intro, the origin of life, DNA biochemistry	1.1-1.10	Quiz 1 on lectures 1-3 due 11:59p 08/28
Lecture 2 (~08/25)	RNA biochemistry, gene structure, mutations	1.11-1.27, 3.1-3.11, 23.1-23.3	Honorlock test quiz due 11:59p 09/01

Lecture # (suggested date)	Subject material	Suggested reading	Due dates for exams, quizzes, and homework
Lecture 3 (~08/27)	Genome structure and contents	4.1-4.9	MCB6937 lit. reflection #1 due 11:59p 09/02
Lecture 4 (~09/01)	Comparative genomics and evolution	5.1-5.23	Quiz 2 on lectures 4 and 5 due 11:59p 09/04
Lecture 5 (~09/03)	Methods in molecular biology	2.1-2.12	Exam I starts 8a 09/07 ends 8p 09/10
Module II: the meaning of life (DNA replication, cell division, repair, incursions)			
Lecture 6 (~09/10)	DNA replication and cell division in prokaryotes	9.1-9.8, 10.1-10.7, 11.1-11.12, 11.15	BLAST and NCBI homework due 11:59p 9/16
Lecture 7 (~09/15)	DNA replication and mitosis in eukaryotes	9.9-9.11, 10.8-10.11, 11.13	Quiz 3 on lectures 6, 7, 8 due 11:59p 09/18
Lecture 8 (~09/17)	Meiosis and life cycles	13.1-13.5; Wikipedia life cyc	MCB6937 lit. reflection #2 due 11:59p 09/23
Lecture 9 (~09/22)	DNA repair	14.1-14.13, 11.14	Quiz 4 on lectures 9 and 10 due 11:59p 09/25
Lecture 10 (~09/26)	Transposable elements and viruses	15.1-15.18	Exam II starts 8a 09/28 ends 8p 09/30
Module III: Putting up some walls (transcription and translation)			
Lecture 11 (~10/01)	Transcription in prokaryotes	17.1-17.17	Poster homework due 11:59p 10/07
Lecture 12 (~10/06)	Transcription in eukaryotes	18.1-18.12	Quiz 5 on lectures 11, 12, 13 due 11:59p 10/08
Lecture 13 (~10/08)	RNA processing	19.1-19.16, 21.1-21.4	MCB6937 lit. reflection #3 due 11:59p 10/14
Lecture 14 (~10/13)	RNA localization and stability	20.1-20.11	Quiz 6 on lectures 14 and 15 due 11:59p 10/16
Lecture 15 (~10/15)	Translation	22.1-22.22, 23.9	Exam III starts 8a 10/19 ends 8p 10/21
Module IV: Work smarter, not harder (gene regulation and cell differentiation)			
Lecture 16 (~10/22)	Gene regulation in prokaryotes	24.1-24.16	Quiz 7 on lectures 16, 17, 18 due 11:59p 10/30
Lecture 17 (~10/27)	Gene regulation eukaryotes	26.1-26.14	PCB 4522 + MCB 6937 lit. reflection homework due 11:59p 10/28
Lecture 18 (~10/29)	Epigenetics	27.1-27.6, 28.1-28.5	MCB 6937 lit. reflection #4 due 11:59p 11/04
Lecture 19 (~11/03)	Intro to developmental biology	Wikipedia dev. biol. page	Quiz 8 on lectures 19 and 20 due 11:59p 11/06
Lecture 20 (~11/05)	Genetic compensation	none (lit. reflection HW)	Exam IV starts 8a 11/09 ends 8p 11/12
Module V: The Frontier Awaits (modern tools, applications, and approaches)			

Lecture # (suggested date)	Subject material	Suggested reading	Due dates for exams, quizzes, and homework
Lecture 21 (~11/13)	CRISPR and gene editing	Review paper link	
Lecture 22 (~11/18)	Modern genetic tools	Gal4/UAS , AAVs , Brainbow	Sequence design homework due 11:59p 11/18
Lecture 23 (~11/20)	Sequencing approaches	Illumina , PacBio , Nanopore , e, scRNAseq	Quiz 9 on lectures 21, 22, 23 due 11:59p 11/20
Lecture 24 (~12/02)	None – hurricane buffer/extra review		Exam V during finals week (date TBD)

University Policies and Resources

Information about grading policies, support for students with disabilities, course evaluations, the Honor Code, and other course policies and campus resources can be found on the [Syllabus Policies page](#).

Attendance Policy

Excused and Unexcused Absences

Students may only participate in classes if they are registered officially or approved to audit with evidence of having paid audit fees. The Office of the University Registrar provides official class rolls to instructors.

Students are responsible for satisfying all academic objectives as defined by the instructor. Absences count from the first-class meeting.

Acceptable reasons for absence from or failure to engage in class include illness; Title IX-related situations; serious accidents or emergencies affecting the student, their roommates, or their family; special curricular requirements (e.g., judging trips, field trips, professional conferences); military obligation; severe weather conditions that prevent class participation; religious holidays; participation in official university activities (e.g., music performances, athletic competition, debate); and court-imposed legal obligations (e.g., jury duty or subpoena). Other reasons (e.g., a job interview or club activity) may be deemed acceptable if approved by the instructor.

For all planned absences, a student in a situation that allows an excused absence from a class, or any required class activity must inform the instructor as early as possible prior

to the class. For all unplanned absences because of accidents or emergency situations, students should contact their instructor as soon as conditions permit.

Students shall be permitted a reasonable amount of time to make up the material or activities covered during absence from class or inability to engage in class activities because of the reasons outlined above.

If a student does not participate in at least one of the first two class meetings of a course or laboratory in which they are registered, and they have not contacted the department to indicate their intent, the student can be dropped from the course. Students must not assume that they will be dropped, however. The department will notify students if they have been dropped from a course or laboratory.

The university recognizes the right of the instructor to make attendance mandatory and require documentation for absences (except for religious holidays), missed work, or inability to fully engage in class. After due warning, an instructor can prohibit further attendance and subsequently assign a failing grade for excessive absences.

Religious Holidays Guidelines

At the University of Florida, students and faculty work together to allow students the opportunity to observe the holy days of their faith. A student should inform the faculty member of the religious observances of their faith that will conflict with class attendance, with tests or examinations, or with other class activities prior to the class or occurrence of that test or activity. The faculty member is then obligated to accommodate that particular student's religious observances. Because students represent a myriad of cultures and many faiths, the University of Florida is not able to assure that scheduled academic activities do not conflict with the holy days of all religious groups. Accordingly, individual students should make their need for an excused absence known in advance of the scheduled activities.

The Florida Board of Education and state law govern university policy regarding observance of religious holidays.

Guidelines

- Students, upon prior notification to their instructors, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith.
- Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence.
- Students shall not be penalized due to absence from class or other scheduled academic activity because of religious observances.

If a faculty member is informed of or is aware that a significant number of students are likely to be absent from class because of a religious observance, the faculty member should not schedule a major exam or other academic event at that time.

A student who is to be excused from class for a religious observance is not required to provide a second party certification of the reason for the absence. Furthermore, a student who believes that they have been unreasonably denied an education benefit due to religious beliefs or practices may seek redress through the student grievance procedure.

Absence due to Illness

A student who is absent from class or any required class-related activity because of illness should contact their instructor, if feasible, as early as possible prior to the missed class or activity.

Students shall be permitted a reasonable amount of time to make up the material or activities covered during an excused absence.

Students should contact their college by the deadline to drop a course for medical reasons. Students can petition the Dean of Students Office to drop a course for medical reasons. The university's policy regarding medical excuse from classes is maintained by the Student Health Care Center.

Twelve-Day Rule

Students who participate in university-sponsored athletic or scholarly activities are permitted to be absent 12 scholastic days per semester without penalty. A scholastic day is any day on which regular class work is scheduled as defined in the approved university calendar. [More Info](#)

The student or student's advisor must notify the instructor as early as possible prior to the anticipated absence to allow ample time for accommodations. Instructors must be flexible and not penalize students when re-scheduling during-term and final exams, class assignments, and other required activities and must follow the UF Attendance Policy herein and UF Examination Policies. As noted in the UF Examination Policies, during-term exams should be re-scheduled no later than before the end of the semester, while final exams no later than 90 days after the originally scheduled exam time. However, instructors are encouraged to re-schedule final and during-term exams, assignments, and other activities as soon as possible after the last day of the absence and must not penalize the student in any way. [More Info](#)

A group's schedule that requires absence of more than 12 scholastic days should be adjusted so that no student is absent from campus more than 12 scholastic days. Students who previously have been warned in writing by their instructor about the impact of absences on their individual class performance should not incur additional absences, even if they have not been absent 12 scholastic days. The student is responsible to maintain satisfactory academic performance and attendance.

Course Policies and Resources

Exam and Proctoring Information: For the exams, you must use the Chrome browser with the Honorlock extension. You are also required to procure and use an external camera with at least a 110° viewing window ([I recommend this camera](#)). Your screen and immediate surroundings will be monitored for suspicious activity and reported if anything is detected. Someone from the teaching team will review your Honorlock video for each exam. Canvas also records a log of test taker network and screen activity during the exam. **If the teaching team determines you were using any outside resources, like your phone, during the exam, you will receive a 0 and be referred to the Dean of Students Office for an Honor Code violation.**

For each exam, there is a 2.5 school day window of in which you can complete it (note: exams I and IV last 3.5 days because of holidays). The exam windows will open at 8:00 AM EST and close at 8:00 PM EST 2.5 (or 3.5) days later. These exams are designed to take ~40 minutes to complete, but I make them universally accessible from a timing perspective by giving all students 2 hours to complete each exam. Thus, all students benefit from a 3x time increase, assuming you begin the exam prior to 6 PM on the last day. If you live in a different time zone, please take this into account: Canvas will lock your exam responses at 8 PM Eastern Standard Time. You can complete your exam with Honorlock proctoring at any time during the exam window. You do not need to schedule an appointment to use Honorlock. The exams are closed book with a lockdown browser. You may use one sheet of **blank** scratch paper during the exam (you must show it to the camera before and after the exam). To learn more about Honorlock, go to the student page of Honorlock and watch their quick video at: <https://honorlock.com/students/>

Note: If you have privacy concerns regarding Honorlock's access to your computer activity outside of the times it is required for class, the Honorlock extension can be easily removed from your browser immediately after each exam or the test quiz (you'll need to add it again for the next exam). To remove it, go to Chrome -> preferences -> settings -> extensions and select remove Honorlock.

When you start the onboarding process for Honorlock you will be asked to take a picture of your face and your photo ID. You may need to do this using your laptop camera if your external camera cannot focus on your ID. To familiarize you with Honorlock and the external camera, we will do a proctored test quiz. This way, we can work out any bugs well before the proctoring system is needed for an exam. This quiz is due on Tuesday, September 1st by 11:59 PM and a score of 100% is required to access the exams. You

can take the quiz as many times as you want to score 100%. If you are experiencing technical issues that Honorlock support cannot fix, please contact your TA.

Quizzes: There will be nine quizzes on class material. Each quiz covers 2-3 lectures worth of material, they happen each week that there is not an exam. The quizzes are open for one week, usually due on Fridays at 11:59 PM (one exception: Quiz 5 is due on Thursday 10/8 due to homecoming), see the schedule table above for quiz due dates. You have three attempts to submit your quiz, your highest score will be kept. For quizzes with a free response question, only your final free response will be graded. The quizzes are open book – please feel free to use outside resources and collaborate with your classmates to complete them. However, I do encourage you to *actually* quiz yourself on at least the first attempt in order to identify which areas of the material you may need to review. I have structured the quiz questions to be similar in difficulty and scope to exam questions, so these should be thought of as a tool for you to hone your knowledge of the material on which you will be tested.

Homework: PCB 4522 will have four homework assignments: 1) BLAST tutorial, 2) science poster, 3) literature reflection, and 4) sequence and cloning design. MCB 6937 will have four *additional* homework assignments, all of which are literature reflections. Note that in the course content table on the previous page, the 4th column indicating the due dates does not necessarily align with the lecture dates in the first column. See the canvas page “Homework Assignments” for more information and links to assignment prompts and rubrics. You may correspond with your classmates about their content and use outside resources, but each student is expected to turn in their own unique work which will be subject to plagiarism and AI checks. You may not plagiarize or use an AI text generator to complete your homework.

Teaching Assistants: We have graduate TAs and undergraduate TAs on our teaching team. Please use them as the knowledgeable resources that they are. All TAs have either taken my class or served as a TA previously. Each student is designated one TA. In most cases, they should be your first point of contact if you have any questions about the content of this course. See the Canvas page “Teaching Assistants” for TA bios and a link to the TA designations.

Discord: The teaching team moderates a Discord page where you can ask and answer questions about genetics! Someone from the teaching team will try to always respond within a few hours between 8 AM and 8 PM most days. This means that if you are scrambling to finish a quiz at 11:30 PM, you may not get answers from myself or a TA until it is too late, though your fellow classmates might be able to point you in the right direction. Please read the rules for the page and be respectful.

Appealing grades: The teaching team is always happy to discuss why answers you submitted did or did not receive full credit -- helping you understand genetics is our job! However, in the case of the essay questions in this course, we will not regrade questions until the end of the course, and only if it could make the difference between letter grades.

Thus: feel free to bring questions to office hours or email your TA to clarify why your answer did not receive full credit, but we will not reconsider the score you were given unless it matters for your letter grade at the end of the class.

Late and Make Up Work Policy

“The due dates are the due dates.” I only accept quiz, homework, and exam submissions made before the due date, unless you have a documented extenuating circumstance that is verified by requesting a letter from the UF Dean of Students Office (DSO) declaring you were sick or otherwise experiencing an extenuating circumstance on the due date. They require documentation, so plan accordingly. <https://care.dso.ufl.edu/instructor-notifications/>

CALS Curriculum Committee

Submission Checklist

Updated January 2026

NOTE: This checklist must be included with all course and certificate submissions.

The checklist below is intended to facilitate course and certificate submissions to the University of Florida Academic Approval Tracking System (<https://approval.ufl.edu/>). The checklist consists of the most common items that can cause a submission to require changes or be recycled. Contrary to information provided on the UF approval site, the CALS Curriculum Committee requires a syllabus be submitted with each new course or course modification request. Please note that submitters are encouraged to attend the CALS CC meeting at which their item is being reviewed. This allows the submitter to answer any potential questions that may arise that could cause the item to not be approved. Also, be aware that when completing the UCC form the section Description of Request is asking for a brief statement about what you are doing. This is **not** the place for a course description. A statement such as “Proposal of a new undergraduate course” is all that is needed. Please do not submit documents in pdf format. All documents should be submitted in Word to facilitate editing on our end if necessary.

CHECKLIST: PLEASE INITIAL OR MARK N/A FOR EACH STATEMENT TO INDICATE YOUR COMPLIANCE.

SYLLABUS: You are encouraged to use the CALS ACCESSIBLE SYLLABUS TEMPLATE. Accessibility will be required by APRIL 2026.

****Use of Simple Syllabus will be required for Summer 2026 forward. It is slated to be released to faculty in late February 2026.****

JH It is required when making a submission that you consult your department’s representative to the CALS CC. A list of current members can be found on the committee site located at: <https://cals.ufl.edu/faculty-staff/committees/>.

NA Submission of a course modification requires both the current version of the course syllabus and the proposed version.

NA Joint course submissions must include 1) both graduate and undergraduate syllabuses and 2) a separate document outlining the substantial (more than one) differences in assignments between the two courses. These assignments must account for at least a 15% difference in graded material between the two levels. If this is a new course submission both courses must be submitted for approval simultaneously.

JH The course description on the UCC form and in the syllabus must match and should be no longer than 500 characters. **FOR AN EXISTING COURSE, THE DESCRIPTION MUST MATCH THE CATALOG DESCRIPTION**. Follow the [COURSE DESCRIPTION GUIDELINES](#) for new courses if not contraindicated by outside certification requirements. Any other information you wish to include needs to be under a different heading such as background or additional course information.

JH The course learning objectives must be consistent with Bloom's taxonomy. Please see the following link at the CALS Curriculum site. (https://cals.ufl.edu/content/PDF/Faculty_Staff/cals-courseobjectives.pdf). Do not use the words demonstrate or understand when listing learning objectives.

JH The course schedule should be concise and include the appropriate number of weeks in the semester.

JH All graduate course submissions must include a reading list if a textbook is not required. The reading list should include at least some current readings (within the last 5 years). All readings do not need to be current.

NA Outside consultations are required if there is a possibility of the proposed course covering a significant amount of material taught in another department or college on campus. There must be a consult form completed by the chair of the department from who you are seeking the consult. Instructors may provide additional consults. The form can be found at: <https://approval.ufl.edu/policies/external-consultations/>.

JH Prerequisite courses are required for 3000 and 4000 level courses. This line of the approval form cannot be "none" or left blank. Junior or senior standing is an acceptable option. A phrase such as "a course in basic biology" is not acceptable. (Graduate courses should not have specific courses listed as prerequisites. If needed a statement of skills required prior to taking the course can be provided under other course information.)

JH Decimal points must be included in the grading scale if grade cut-offs are based on percentages. While this is not a university policy it is a CALS standard practice to avoid any confusion when final grades for the course are determined.

JH The attendance and make-up policy in a syllabus cannot contradict the university's policy. Do not include any additional wording to this policy. A statement and link regarding this are included in the CALS Syllabus Statements. For the approval process the college suggests a less is more view when it comes to this policy.

JH The most recent version of the UF Syllabus Statements. Using the accessible syllabus template will ensure you have the most up to date statements. Do not use boilerplate statements from an old syllabus as they are likely to be out of date.

Certificates

If proposing a new undergraduate or graduate level certificate that includes any courses outside of the submitters department a statement regarding any possible impact on those courses needs to be included. An email from the instructor is acceptable. Also, any courses required for the certificate must have permanent prefixes and course numbers. The submission must include intended catalog copy. (Contact Dr. Anne Mathews (anne.mathews@ufl.edu) for further instruction)



PLP6### [Applied AI in Plant Health]

Fall - 2026

Course Format: Primarily Classroom (in-person with a synchronous Zoom option)

Number of Credits: 2

Delivery Method: Primarily Classroom

Format: Primarily in Class

Lecture: Wednesday, Period 8 (3:00–3:50 PM) — Fifield Hall 2564

Laboratory: Wednesday, Period 9 (4:05–4:55 PM) — Fifield Hall 2564

Instructor Information

Dr. Jose Huguet-Tapia

Telephone: 352-273-4628

Office Hours:

Monday 1:55 PM – 3:50 PM

Preferred Method of Communication: Email (jhuguet@ufl.edu) / Canvas

Office Location

Room 1403 Fifield Hall

Course Details

Course Description: Explores artificial intelligence applications for plant health, disease diagnosis, and pathogen detection. Covers AI techniques for analyzing genomic and phenotypic data, with emphasis on real-world research and diagnostic applications.

Pre- and Co-Requisites: None. This course complements PLP6235C; prior completion is recommended. STA 6093 and BSC6895C are also good complementary courses.

Credit Hours: 2

Additional Course Description

This course is tailored for graduate students in plant pathology and related disciplines who are engaged in applying artificial intelligence (AI) to their research projects. While the course covers the foundations of AI, its main objective is to provide practical, case-specific guidance that students can adapt to their own research. Beyond the semester, the course also serves as an entry point for continued guidance from the instructor on AI applications within each student's area of research. It complements PLP6235C in the plant pathology graduate curriculum.

Recommended Background:

Students should have foundational knowledge in big data, "-omics" analysis, bioinformatics workflows, biology, plant health, and genetics. Familiarity with Python programming and basic

AI concepts is recommended. Comfort with data analysis techniques and handling biological datasets is beneficial. Complementary courses include STA 6093 and BSC6895C.

Required Materials

A set of assigned scientific papers will serve as the required readings for the course. These papers provide the foundational concepts for each lecture and form the basis for in-class discussion. All readings will be posted in Canvas. During in-class discussions, students are expected to actively engage with and reference the assigned papers.

1. Nyawose, T., Maswanganyi, R. C., & Khumalo, P. (2025). **A review on the detection of plant disease using machine learning and deep learning approaches**. *Journal of Imaging*, 11(10), 326. <https://doi.org/10.3390/jimaging11100326>
2. Jafar, A., Bibi, N., Naqvi, R. A., Sadeghi-Niaraki, A., & Jeong, D. (2024). **Revolutionizing agriculture with artificial intelligence: Plant disease detection methods, applications, and their limitations**. *Frontiers in Plant Science*, 15, 1356260. <https://doi.org/10.3389/fpls.2024.1356260>
3. Zhao, X., Wang, L., Zhang, Y., Han, X., Deveci, M., & Parmar, M. (2024). **A review of convolutional neural networks in computer vision**. *Artificial Intelligence Review*, 57(4), 99. <https://doi.org/10.1007/s10462-024-10721-6>
4. Wang, C. Y., Bochkovskiy, A., & Liao, H. Y. M. (2024). **YOLO advances to its genesis: A decadal and comprehensive review of the You Only Look Once (YOLO) series**. *Artificial Intelligence Review*, 57(8), 1–37. <https://doi.org/10.1007/s10462-025-11253-3>
5. Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, Ł., & Polosukhin, I. (2017). **Attention is all you need**. *Advances in Neural Information Processing Systems (NeurIPS)*, 30, 5998–6008. <https://arxiv.org/abs/1706.03762>
6. Gao, Y., Xiong, Y., Gao, X., Jia, K., Pan, J., Bi, Y., Dai, Y., Sun, J., Wang, M., & Wang, H. (2024). **Retrieval-Augmented Generation for Large Language Models: A Survey**. *arXiv preprint arXiv:2312.10997*. <https://arxiv.org/abs/2312.10997>
7. Abramson, J., Adler, J., Dunger, J., Evans, R., Green, T., Pritzel, A., Ronneberger, O., Willmore, L., Ballard, A. J., Bambrick, J., Barfuss, S. W., Bodenstein, D. A., Bradley, D. E., Bray, M. S., Brouley, B. J., Byrne, J., Buoninsegni, A., Bullock, C., Bunner, A., et al. (2024). **Accurate structure prediction of biomolecular interactions with AlphaFold 3**. *Nature*, 630(8016), 493–500. <https://doi.org/10.1038/s41586-024-07487-w>
8. Alexander, C. S., Yarborough, M., & Smith, A. (2024). **Who is responsible for 'responsible AI'? Navigating challenges to build trust in AI agriculture and food system technology**. *Precision Agriculture*, 25(1), 146–185. <https://doi.org/10.1007/s11119-023-10063-3>

Reading accountability: To ensure students complete the assigned reading before each lecture, most modules include a short pre-lecture reading quiz posted in Canvas and due before the corresponding class session. These pre-quizzes are based on that week's assigned paper and on the upcoming lecture material, which is made available in advance so that students can review it beforehand. They count toward the quiz portion of the grade and are recorded automatically in Canvas

Required equipment: Because laboratory exercises are conducted using Google Colab notebooks, students must have access to their own laptop or computer to participate in each session, whether attending in person or remotely.

Recommended Materials

1. Chollet, F. **Deep Learning with Python**. Manning Publications. ISBN-13: 978-1617294433.

A note on Materials

All required readings, lecture presentations and Colab notebooks templates will be posted in [Canvas UF](#). There is no required textbook to purchase for this course.

Course Goals and Objectives

This course is designed to:

- Introduce students to the foundational principles of artificial intelligence and how they apply to plant health;
- Familiarize students with current scientific literature on AI applications in plant health;
- Develop students' ability to use AI-based image-analysis techniques for plant disease detection and diagnosis;
- Explore the capabilities, limitations, and appropriate uses of generative AI tools for plant health tasks;
- Raise awareness of the ethical, legal, and societal implications of using AI in plant health; and
- Guide students in developing analytical pipelines that apply AI to real plant health problems.

Expectations and Student Learning Outcomes

Students who successfully complete this course will be able to:

1. Explain the foundational principles of artificial intelligence and describe how they apply to plant health.
2. Critically evaluate scientific literature on AI applications in plant health.
3. Apply AI-based image-analysis techniques to detect and diagnose plant diseases.
4. Assess the capabilities, limitations, and appropriate uses of generative AI tools for plant health tasks.
5. Analyze the ethical, legal, and societal implications of using AI in plant health.
6. Design, implement, and evaluate an analytical pipeline that uses AI to address a plant health problem.

Methods of Evaluation

Course grading is consistent with UF grading policies. Grading is based on pre- and post-quizzes, lab work, two assignments, and one presentation, for a total of 100 points, as outlined below.

Quizzes — 10 points

Short quizzes will be posted in Canvas for most modules — one pre-quiz and one post-quiz each, for a total of 20 quizzes (10 pre and 10 post) worth 0.5 points each. **The pre-quiz covers**

the assigned reading and the upcoming lecture material, which is posted in advance so students can review it, and is due before the corresponding class session. The post-quiz assesses your understanding of the module's material. Completion of all quizzes is required and will be graded on accuracy.

Lab Work (Colab notebooks) — 10 points

Each lecture includes a hands-on laboratory exercise in a Google Colab notebook. Students are expected to work through the notebook during the class-lab session, whether attending in person or remotely, and submit their completed notebook in Canvas by the end of that lecture. The 10 lab-work points are distributed across these notebooks. Because each notebook is completed and submitted live during class, these submissions also serve as the record of attendance: a student who is present submits that session's notebook, while a student who is absent does not. A student with an excused absence (as defined in the Attendance Policy) may make up the notebook by contacting the instructor, watching the recorded lecture, and then completing and submitting the notebook in Canvas. Unexcused absences forfeit that session's lab-work points.

Assignment 1 — Dataset Analysis — 25 points

Upon completion of Module 6, students will analyze a provided dataset and answer a set of guided questions based on their analysis. The questions are designed to assess understanding of the analytical process, the tools applied, and the interpretation of results. Responses must be submitted through Canvas along with a recorded video walkthrough of the analysis.

Assignment 2 — Mini-Project — 30 points

Students will design and execute a mini-project using either a provided dataset or a dataset of their own choosing (subject to instructor approval). The goal is to develop an analytical pipeline, conduct a preliminary analysis, and generate initial results. **Submission:** Written report detailing the methodology, results, and interpretation.

Presentation — 25 points

The presentation is based on the work completed in Assignment 2. Students are expected to clearly communicate their pipeline design, analytical choices, and findings to the class. Grading will consider clarity of explanation, scientific justification of decisions made, and quality of the overall presentation. Presentation could be in person or a recorded video.

Component	Points	What It Evaluates
Quizzes (20 total: 10 pre + 10 post, 0.5 pts each)	10	Pre-quiz: whether you completed the assigned reading and reviewed the upcoming lecture material <i>before</i> class (preparation). Post-quiz: your understanding of the module's material <i>after</i> the lecture. Graded on accuracy.
Lab Work (Colab notebooks)	10	Hands-on application of the methods, via the weekly Google Colab notebook completed and submitted by the end of each lecture. Also serves as the attendance record.
Assignment 1	25	Your understanding of the analytical process, correct use of the tools, and interpretation of results. Submitted in Canvas with a recorded video walkthrough.
Assignment 2	30	Your ability to independently design and execute an analytical pipeline, run a preliminary analysis, and interpret results. Submitted as a written report.

Presentation	25	Communication of your pipeline design and analytical choices, scientific justification of your decisions, and overall clarity and quality. Delivered live or as a recorded video, shared with the class.
Total	100	

Grading Scale

Final grades are based on the percentage of the 100 total points earned. In accordance with current University of Florida policy, grade points will be assigned as follows:

Letter Grade	Percent of Total Points	GPA Impact
A	93.00–100%	4.0
A-	90.00–92.99%	3.67
B+	87.00–89.99%	3.33
B	83.00–86.99%	3.0
B-	80.00–82.99%	2.67
C+	77.00–79.99%	2.33
C	73.00–76.99%	2.0
C-	70.00–72.99%	1.67
D+	67.00–69.99%	1.33
D	63.00–66.99%	1.0
D-	60.00–62.99%	0.67
E	0–59.99%	0

Course Schedule

Modules approximately correspond to one week of the course, but modules share connections and build across weeks of the course. This is subject to change based on whole-group progress through the course materials.

Week – Module	Activities	Assessment	Objectives Addressed
Week 1 (Aug 26) – Module 1: Organizational Meeting and Intro to Google Colab Notebooks	Review of the Canvas site and syllabus; intro Q&A on using Canvas and Google Colab notebooks (Google's cloud-based Jupyter notebook environment).	Completion of Google Colab notebook exercises	1
Week 2 (Sep 2) – Module 2: Foundations of AI	Lecture on AI general concepts; Reading 1.	Pre- and post-quiz on AI concepts. Completion of Google Colab notebook exercises	1

Week – Module	Activities	Assessment	Objectives Addressed
Week 3 (Sep 9) – Module 3: Machine Learning in Plant Health	Lecture on ML concepts; Readings 1 and 2; Colab notebook tutorial with hands-on algorithm comparison.	Pre- and post-quiz on ML tools and frameworks. Completion of Google Colab notebook exercises	1, 2
Week 4 (Sep 16) – Module 4: Deep Learning in Plant Health	Lecture on deep learning; Readings 1 and 2; Colab notebook tutorial with a guided disease-detection pipeline build; exercise in Deep Playground.	Pre- and post-quiz on CNN concepts. Completion of Google Colab notebook exercises	1, 3
Week 5 (Sep 23) – Module 5: Disease Diagnosis I – Dataset Repositories (Vegetable Disease Images)	Lecture on dataset curation; Reading 3; hands-on dataset exploration and annotation exercise.	Pre- and post-quiz Completion of Google Colab notebook exercises	3
Week 6 (Sep 30) – Module 6: Disease Diagnosis II – Plant Disease Classification	Lecture on classification methods; Reading 3; hands-on training and evaluation of a classification model.	Pre- and post-quiz on classification models. Completion of Google Colab notebook exercises	3
<i>Week 6 (Sep 30) – Assignment 1 Assigned</i>	<i>Assignment 1 handed out to students.</i>	—	3, 4
Week 7 (Oct 7) – Module 7: Case Study 1 – Plant Disease Identification and Classification	Lecture on YOLO; Reading 4; hands-on testing and evaluation of YOLO for leaf-disease identification and classification.	Pre- and post-quiz on YOLO and detection techniques. Completion of Google Colab notebook exercises	2, 3
<i>Week 7 (Oct 7) – Assignment 1 Due</i>	—	<i>Assignment 1 submitted.</i>	
Week 8 (Oct 14) – Module 8: Case Study 2 – Classification of Microstructures	Lecture on microstructure classification; Reading 4; hands-on feature extraction and model training with YOLO.	Completion of Google Colab notebook exercises	2, 3
<i>Week 9 (Oct 21) – Assignment 2 Assigned</i>	<i>Assignment 2 handed out to students.</i>	—	6
Week 9 (Oct 21) – Module 9: Large Language Models	Lecture on transformers and LLMs; Reading 5.	Pre- and post-quiz on LLM concepts.	1, 4

Week – Module	Activities	Assessment	Objectives Addressed
		Completion of Google Colab notebook exercises	
Week 10 (Oct 28) – Module 10: Beyond the Chatbot – RAG, Agents, and MCP in Plant Health	Lecture on RAG, agents, and MCP as ways of extending LLMs beyond chat; Reading 6; hands-on demo of a RAG or agent-based workflow.	Pre- and post-quiz on RAG, agents, and MCP concepts. Completion of Google Colab notebook exercises	4
Week 11 (Nov 4) – Module 11: AI Models for Protein Folding and Interaction (AF3)	Lecture on protein-structure prediction; Reading 7; hands-on prediction and visualization of protein structures using the AF3 Server.	Pre- and post-quiz on protein-structure prediction. Completion of Google Colab notebook exercises	3
<i>Nov 11 – No class (Veterans Day)</i>	—	—	
Week 12 (Nov 18) – Module 12: Ethics and Future Directions in AI	Lecture on AI ethics; Reading 8; group discussion on responsible AI use.	Pre- and post-quiz on AI ethics. Completion of Google Colab notebook exercises	5
<i>Nov 25 – No class (Thanksgiving Break)</i>	—	—	
Weeks 13–14 (Dec 2–9): Final Project Presentations (Assignment 2)	Project work sessions and peer-feedback rounds, culminating in presentations.	Final project report and presentation.	4, 5, 6
<i>Week 14 (Dec 9) – Assignment 2 Due</i>	—	<i>Assignment 2 (written report) submitted.</i>	6

Key to abbreviations: AI = artificial intelligence; ML = machine learning; CNN = convolutional neural network; YOLO = You Only Look Once; LLM = large language model; RAG = retrieval-augmented generation; MCP = Model Context Protocol; AF3 = AlphaFold 3.

Objectives Addressed numbers correspond to the Student Learning Outcomes listed above (1–6).

University Policies and Resources

Academic policies for this course are consistent with university policies. Information about grading policies, support for students with disabilities, course evaluations, the Honor Code, and other course policies and campus resources can be found on the [Syllabus Policies page](#).

Campus Health and Wellness Resources

Visit <https://one.uf.edu/whole-gator/topics> for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact U Matter, We Care for additional and immediate support.

Attendance Policy

This is a primarily in-class course. Students may attend in person or synchronously online via Zoom, using the link posted in Canvas. Because laboratory exercises are completed in Google Colab during class, students should have access to a laptop or computer for each session.

Excused and Unexcused Absences

Students may only participate in classes if they are registered officially or approved to audit with evidence of having paid audit fees. The Office of the University Registrar provides official class rolls to instructors.

Students are responsible for satisfying all academic objectives as defined by the instructor. Absences count from the first-class meeting.

Acceptable reasons for absence from or failure to engage in class include illness; Title IX-related situations; serious accidents or emergencies affecting the student, their roommates, or their family; special curricular requirements (e.g., judging trips, field trips, professional conferences); military obligation; severe weather conditions that prevent class participation; religious holidays; participation in official university activities (e.g., music performances, athletic competition, debate); and court-imposed legal obligations (e.g., jury duty or subpoena). Other reasons (e.g., a job interview or club activity) may be deemed acceptable if approved by the instructor.

For all planned absences, a student in a situation that allows an excused absence from a class, or any required class activity must inform the instructor as early as possible prior to the class. For all unplanned absences because of accidents or emergency situations, students should contact their instructor as soon as conditions permit.

Students shall be permitted a reasonable amount of time to make up the material or activities covered during absence from class or inability to engage in class activities because of the reasons outlined above.

If a student does not participate in at least one of the first two class meetings of a course or laboratory in which they are registered, and they have not contacted the department to indicate their intent, the student can be dropped from the course. Students must not assume that they will be dropped, however. The department will notify students if they have been dropped from a course or laboratory.

The university recognizes the right of the instructor to make attendance mandatory and require documentation for absences (except for religious holidays), missed work, or inability to fully engage in class. After due warning, an instructor can prohibit further attendance and subsequently assign a failing grade for excessive absences.

Religious Holidays Guidelines

At the University of Florida, students and faculty work together to allow students the opportunity to observe the holy days of their faith. A student should inform the faculty member of the religious observances of their faith that will conflict with class attendance, with tests or examinations, or with other class activities prior to the class or occurrence of that test or activity.

The faculty member is then obligated to accommodate that particular student's religious observances. Because students represent a myriad of cultures and many faiths, the University of Florida is not able to assure that scheduled academic activities do not conflict with the holy days of all religious groups. Accordingly, individual students should make their need for an excused absence known in advance of the scheduled activities.

The Florida Board of Education and state law govern university policy regarding observance of religious holidays.

Guidelines

- Students, upon prior notification to their instructors, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith.
- Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence.
- Students shall not be penalized due to absence from class or other scheduled academic activity because of religious observances.

If a faculty member is informed of or is aware that a significant number of students are likely to be absent from class because of a religious observance, the faculty member should not schedule a major exam or other academic event at that time.

A student who is to be excused from class for a religious observance is not required to provide a second party certification of the reason for the absence. Furthermore, a student who believes that they have been unreasonably denied an education benefit due to religious beliefs or practices may seek redress through the student grievance procedure.

Absence due to Illness

A student who is absent from class or any required class-related activity because of illness should contact their instructor, if feasible, as early as possible prior to the missed class or activity.

Students shall be permitted a reasonable amount of time to make up the material or activities covered during an excused absence.

Students should contact their college by the deadline to drop a course for medical reasons. Students can petition the Dean of Students Office to drop a course for medical reasons. The university's policy regarding medical excuse from classes is maintained by the Student Health Care Center.

Twelve-Day Rule

Students who participate in university-sponsored athletic or scholarly activities are permitted to be absent 12 scholastic days per semester without penalty. A scholastic day is any day on which regular class work is scheduled as defined in the approved university calendar.

The student or student's advisor must notify the instructor as early as possible prior to the anticipated absence to allow ample time for accommodations. Instructors must be flexible and not penalize students when re-scheduling during-term and final exams, class assignments, and other required activities and must follow the UF Attendance Policy herein and UF Examination Policies. As noted in the UF Examination Policies, during-term exams should be re-scheduled no later than before the end of the semester, while final exams no later than 90 days after the originally scheduled exam time. However, instructors are encouraged to re-schedule final and

during-term exams, assignments, and other activities as soon as possible after the last day of the absence and must not penalize the student in any way.

A group's schedule that requires absence of more than 12 scholastic days should be adjusted so that no student is absent from campus more than 12 scholastic days. Students who previously have been warned in writing by their instructor about the impact of absences on their individual class performance should not incur additional absences, even if they have not been absent 12 scholastic days. The student is responsible to maintain satisfactory academic performance and attendance.

Late and Make Up Work Policy

Work submitted after its deadline will be accepted only for documented excused absences; otherwise, it may receive a grade penalty. Please refer to the [university policy on attendance](#), absences, and make-up work.

Classroom Behavior

Students are expected to engage respectfully and professionally with the instructor and their peers during all class sessions, whether attending in person or online via Zoom.

Technology in the Classroom

Use of Generative AI in the Course:

This course encourages the use of AI tools to complement learning.

Students are allowed to use AI for:

- Brainstorming ideas and refining concepts.
- Exploring different approaches to problem-solving.
- Assisting with coding and debugging.
- Enhancing understanding through interactive AI discussions.

To ensure comprehension and originality, students are required to:

- Present their work orally (in recorded video files or oral presentation in class) to demonstrate their understanding.
- Incorporate AI interactions as part of their presentation to showcase critical thinking.
- Discuss AI-generated insights and refine them through logical reasoning.

By incorporating AI into learning while emphasizing critical analysis and personal interpretation, students will strengthen their understanding and develop problem-solving skills in AI applications.

Any detected instance of simple copy-and-paste from a generative AI, without personal interpretation or critical reasoning, will be considered inadequate and will not be evaluated by the instructor. The student will be allowed one final opportunity to re-submit a new assignment; if the student fails the assignment, they will receive a zero.

Course Recordings and Video Submissions

Class sessions are conducted in person and are also streamed and recorded via Zoom. All recorded lectures, along with lecture presentations and Colab notebook templates, are posted in Canvas and are available to every enrolled student to review the course material at any time — not only to those who miss a class. Students who participate with their camera or microphone engaged are consenting to be recorded; to avoid being recorded, keep your camera off and

your microphone muted and use the Zoom chat instead. Recordings are made available only to students enrolled in this course, through Canvas.

Students may record class lectures for their own personal educational use but may not publish or share a recording without the instructor's written consent. Recording and consent are governed by University policy; for full details, see UF's In-Class Recording policy (<https://aa.ufl.edu/policies--guidelines/in-class-recording/>) and the UF Syllabus Policies (<https://go.ufl.edu/syllabuspolicies>).

Some assignments in this course require students to submit their own recorded video. The Assignment 1 walkthrough is submitted through Canvas and is viewed only by the instructor for grading. The final presentation, however, is shared with the class: whether delivered live or as a recorded video, it is intended to be viewed by other students, who may also provide peer feedback. By enrolling and participating, students understand that their final presentation will be shared with classmates in the course.

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. <https://helpdesk.ufl.edu/> | 352-392-4357

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Privacy and Accessibility Policies

Instructure (Canvas) links:

- Instructure Privacy Policy and Instructure Accessibility

Zoom links:

- Zoom Privacy Policy and Zoom Accessibility



PLP6### [Applied AI in Plant Health]

Fall - 2026

Course Format: Hybrid-Flexible

Number of Credits : 2

Meeting Times & Course Format

Format: HyFlex (Hybrid-Flexible)

Class Schedule:

Lecture: Wednesday Period 8 (3:00–3:50 PM)

Laboratory: Wednesday Period 9 (4:05–4:55 PM)

Location: Fifield Hall 2564

Synchronous Attendance Options: Students may attend in-person or join via Zoom.

Off-campus students can access lectures and labs via Zoom link posted in Canvas each week. Attendance via either method is expected, but the choice is yours.

Instructor

Dr. Jose Huguet-Tapia

Room 1403 Fifield Hall

jhuguet@ufl.edu

352-273-4628

Office Hours : Monday 1:55 PM - 3:50 PM

Commented [AM1]: This template follows the [UF Syllabus Policy](#).

To maintain accessibility of the document as you adapt for your course, there is a short instructional video (https://cals.ufl.edu/content/PDF/Faculty_Staff/CALS-Syllabus-Tips.mp4)

And quick reference sheet for this template (https://cals.ufl.edu/content/PDF/Faculty_Staff/Syllabus-Accessibility-Quick-Reference.pdf)

Course Description

Explores artificial intelligence applications for plant health, disease diagnosis, and pathogen detection. Covers AI techniques for analyzing genomic and phenotypic data, with emphasis on real-world research and diagnostic applications.

Course Overview and Purpose

This course is tailored for graduate students in plant pathology and related disciplines who are engaged in applying artificial intelligence (AI) to their research projects. While the course covers the foundations of AI, its main objective is to provide practical, case-specific guidance that students can adapt to their own research. Beyond the semester, the course also serves as an entry point for continued guidance from the instructor on AI applications within each student's area of research. It complements PLP6235C in the plant pathology graduate curriculum.

Course Learning Objectives

1. Explain foundational principles of artificial intelligence and how they apply to plant health.
2. Critically evaluate scientific literature on AI applications in plant health.
3. Apply AI-based image-analysis techniques to plant disease detection and diagnosis.

4. Evaluate the capabilities, limitations, and appropriate uses of generative AI tools for plant health tasks.
5. Analyze the ethical, legal, and societal implications of using AI in plant health.
6. Design, implement, and evaluate an analytical pipeline that uses AI to address a plant health problem.

Course Prerequisites

None. This course is the second in a sequence with PLP6235C, though prior completion is highly encouraged. STA 6093 and BSC6895C are also good complementary courses.

Recommended Background and Course Information

Students should have foundational knowledge in big data, "-omics" analysis, bioinformatics workflows, biology, plant health, and genetics. Familiarity with Python programming and basic AI concepts is recommended. Comfort with data analysis techniques and handling biological datasets is beneficial. Complementary courses include STA 6093 and BSC6895C.

Required Readings

A set of assigned scientific papers will serve as required readings for the course. These papers provide the foundational concepts for each lecture and form the basis for in-class discussion. All readings will be posted in Canvas.

1. Nyawose, T., Maswanganyi, R. C., & Khumalo, P. (2025). **A review on the detection of plant disease using machine learning and deep learning approaches**. *Journal of Imaging*, 11(10), 326. <https://doi.org/10.3390/jimaging11100326>
2. Jafar, A., Bibi, N., Naqvi, R. A., Sadeghi-Niaraki, A., & Jeong, D. (2024). **Revolutionizing agriculture with artificial intelligence: Plant disease detection methods, applications, and their limitations**. *Frontiers in Plant Science*, 15, 1356260. <https://doi.org/10.3389/fpls.2024.1356260>
3. Zhao, X., Wang, L., Zhang, Y., Han, X., Deveci, M., & Parmar, M. (2024). **A review of convolutional neural networks in computer vision**. *Artificial Intelligence Review*, 57(4), 99. <https://doi.org/10.1007/s10462-024-10721-6>
4. Wang, C. Y., Bochkovskiy, A., & Liao, H. Y. M. (2024). **YOLO advances to its genesis: A decadal and comprehensive review of the You Only Look Once (YOLO) series**. *Artificial Intelligence Review*, 57(8), 1–37. <https://doi.org/10.1007/s10462-025-11253-3>
5. Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, Ł., & Polosukhin, I. (2017). **Attention is all you need**. *Advances in*

Neural Information Processing Systems (NeurIPS), 30, 5998–6008.
<https://arxiv.org/abs/1706.03762>

6. Gao, Y., Xiong, Y., Gao, X., Jia, K., Pan, J., Bi, Y., Dai, Y., Sun, J., Wang, M., & Wang, H. (2024). **Retrieval-Augmented Generation for Large Language Models: A Survey**. arXiv preprint arXiv:2312.10997.
<https://arxiv.org/abs/2312.10997>
7. Abramson, J., Adler, J., Dunger, J., Evans, R., Green, T., Pritzel, A., Ronneberger, O., Willmore, L., Ballard, A. J., Bambrick, J., Barfuss, S. W., Bodenstein, D. A., Bradley, D. E., Bray, M. S., Brouley, B. J., Byrne, J., Buoinsegni, A., Bullock, C., Bunner, A., et al. (2024). **Accurate structure prediction of biomolecular interactions with AlphaFold 3**. Nature, 630(8016), 493–500. <https://doi.org/10.1038/s41586-024-07487-w>
8. Alexander, C. S., Yarborough, M., & Smith, A. (2024). **Who is responsible for 'responsible AI'? Navigating challenges to build trust in AI agriculture and food system technology**. Precision Agriculture, 25(1), 146–185.
<https://doi.org/10.1007/s11119-023-10063-3>

Recommended supplementary resources

1. Chollet, F. **Deep Learning with Python**. Manning Publications. ISBN-13: 978-1617294433.

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Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week.
<https://helpdesk.ufl.edu/> | 352-392-4357

Weekly Course Schedule

Modules approximately correspond to one week of the course, but modules share connections and build across weeks of the course. This is subject to change based on whole-group progress through the course materials.

Week – Module	Activities	Assessment	Objectives Addressed ¹
Week 1 (Aug 26) – Module 1: Organizational Meeting and Intro to Google Colab Notebooks	Review of the Canvas site and syllabus; intro Q&A on using Canvas and Google Colab notebooks (Google's cloud-based Jupyter notebook environment).	Completion of Google Colab notebook exercises	—
Week 2 (Sep 2) – Module 2: Foundations of AI	Lecture on AI general concepts; Reading 1.	Pre- and post-quiz on AI concepts. Completion of Google Colab notebook exercises	1,2
Week 3 (Sep 9) – Module 3: Machine Learning in Plant Health	Lecture on ML concepts; Readings 1 and 2; Colab notebook tutorial with hands-on algorithm comparison.	Pre- and post-quiz on ML tools and frameworks. Completion of Google Colab notebook exercises	1,2
Week 4 (Sep 16) – Module 4: Deep Learning in Plant Health	Lecture on deep learning; Readings 1 and 2; Colab notebook tutorial with a guided disease-detection pipeline build; exercise in Deep Playground.	Pre- and post-quiz concepts. Completion of Google Colab notebook exercises	1,2
Week 5 (Sep 23) – Module 5: Disease Diagnosis I – Dataset Repositories (Vegetable Disease Images)	Lecture on dataset curation; Reading 3; hands-on dataset exploration and annotation exercise.	Completion of Google Colab notebook exercises	3
Week 6 (Sep 30) – Module 6: Disease Diagnosis II – Plant Disease Classification	Lecture on CNN methods; Reading 3; hands-on training and	Pre- and post-quiz on CNN. notebook exercises	3

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¹ Numbers correspond to the Course Objectives listed above (1–6).

Week – Module	Activities	Assessment	Objectives Addressed ¹
	evaluation of a classification model.		
Week 6 (Sep 30) – Assignment 1 Assigned	Assignment 1 handed out to students.	—	3, 4
Week 7 (Oct 7) – Module 7: Case Study 1 – Plant Disease Identification and Classification	Lecture on YOLO; Reading 4; hands-on testing and evaluation of YOLO for leaf-disease identification and classification.	Pre- and post-quiz on YOLO and detection techniques. Completion of Google Colab notebook exercises	2, 3
Week 7 (Oct 7) – Assignment 1 Due	—	Assignment 1 submitted.	
Week 8 (Oct 14) – Module 8: Case Study 2 – Classification of Microstructures	Lecture on microstructure classification; Reading 4; hands-on feature extraction and model training with YOLO.	Pre- and post-quiz on microstructure classification. Completion of Google Colab notebook exercises	2, 3
Week 9 (Oct 21) – Assignment 2 Assigned	Assignment 2 handed out to students.	—	6
Week 9 (Oct 21) – Module 9: Large Language Models	Lecture on transformers and LLMs; Reading 5.	Pre- and post-quiz on LLM concepts. Completion of Google Colab notebook exercises	1, 4
Week 10 (Oct 28) – Module 10: Beyond the Chatbot – RAG, Agents, and MCP in Plant Health	Lecture on RAG, agents, and MCP as ways of extending LLMs beyond chat; Reading 6; hands-on demo of a RAG or agent-based workflow.	Pre- and post-quiz on RAG, agents, and MCP concepts. Completion of Google Colab	4

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Week – Module	Activities	Assessment	Objectives Addressed ¹
		notebook exercises	
Week 11 (Nov 4) – Module 11: AI Models for Protein Folding and Interaction (AF3)	Lecture on protein-structure prediction; Reading 7; hands-on prediction and visualization of protein structures using the AF3 Server.	Pre- and post-quiz on protein-structure prediction. Completion of Google Colab notebook exercises	3
Week 12 (Nov 18) – Module 12: Ethics and Future Directions in AI	Lecture on AI ethics; Reading 8; group discussion on responsible AI use.	Pre- and post-quiz on AI ethics. Completion of Google Colab notebook exercises	5
Weeks 13–15 (Dec 2-9): Final Project Presentations (Assignment 2)	Project work sessions and peer-feedback rounds, culminating in presentations.	Final project report and presentation.	4, 5, 6

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Key to abbreviations: AI = artificial intelligence; ML = machine learning; CNN = convolutional neural network; YOLO = You Only Look Once; LLM = large language model; RAG = retrieval-augmented generation; MCP = Model Context Protocol; AF3 = AlphaFold 3.

Grading Policy

Course grading is consistent with [UF grading policies](#).

Course Grading Structure

Grading is based on quizzes, two assignments, and one presentation as outlined below.

Quizzes — 10 points

Short quizzes will be posted in Canvas for most modules — one pre-quiz and one post-quiz each, for a total of 20 quizzes (10 pre and 10 post) worth 0.5 points each. Quizzes assess your understanding of each module's material. Completion of all quizzes is required and will be graded on accuracy.

Assignment 1 — Dataset Analysis — 25 points

Upon completion of Module 6, students will analyze a provided dataset and answer a set of guided questions based on their analysis. The questions are designed to assess understanding of the analytical process, the tools applied, and the interpretation of results. Responses must be submitted through Canvas along with a recorded video walkthrough of the analysis.

Assignment 2 — Mini-Project — 35 points

Students will design and execute a mini-project using either a provided dataset or a dataset of their own choosing (subject to instructor approval). The goal is to develop an analytical pipeline, conduct a preliminary analysis, and generate initial results.

Submission: Written report detailing the methodology, results, and interpretation.

Presentation — 30 points

The presentation is based on the work completed in Assignment 2. Students are expected to clearly communicate their pipeline design, analytical choices, and findings to the class. Grading will consider clarity of explanation, scientific justification of decisions made, and quality of the overall presentation. Presentation could be in person or recorded video.

Component	Points
Quizzes	10
Assignment 1	25
Assignment 2	35
Presentation	30
Total	100

Grading Scale

In accordance with the current University of Florida policy, grade points will be assigned as follows

Letter Grade	Percent of Total Points Associated with Each Letter Grade	GPA Impact of Each Letter Grade
A	93.00-100%	4.0
A-	90.00-92.99%	3.67
B+	87.00-89.99%	3.33
B	83.00-86.99%	3.0
B-	80.00-82.99%	2.67
C+	77.00-79.99%	2.33

C	73.00-76.99%	2.0
C-	70.00-72.99%	1.67
D+	67.00-69.99%	1.33
D	63.00-66.99%	1.0
D-	60.00-62.99%	0.67
E	0-59.99%	0

Use of Generative AI in the Course

This course encourages the use of AI tools to complement learning.

Students are allowed to use AI for:

- Brainstorming ideas and refining concepts.
- Exploring different approaches to problem-solving.
- Assisting with coding and debugging.
- Enhancing understanding through interactive AI discussions.

To ensure comprehension and originality, students are required to:

- Present their work orally (in recorded video files or oral presentation in class) to demonstrate their understanding.
- Incorporate AI interactions as part of their presentation to showcase critical thinking.
- Discuss AI-generated insights and refine them through logical reasoning.

By incorporating AI into learning while emphasizing critical analysis and personal interpretation, students will strengthen their understanding and develop problem-solving skills in AI applications. **Any detected instance of simple copy-and-paste from a generative AI, without personal interpretation or critical reasoning, will be considered inadequate and will not be evaluated by the instructor**

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See <https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/>

Campus Health and Wellness Resources

Visit <https://one.ufl.edu/whole-gator/topics> for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact [UMatterWeCare](#) for additional and immediate support.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such

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Commented [AM6]: UF has moved to a new online repository of academic policies at <https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/>. This includes Attendance and Makeup Work; Academic Accommodations; Grading Policies; Course Evaluation and Feedback; Honesty Policy; In-Class Recording Policy; Academic Resources; and some Campus Health and Wellness. You may use this "Academic Policies and Resources" heading and link in place of the above UF sections. CALS encourages you to keep the Campus Health and Wellness Resources section in this syllabus template because UMatterWeCare is outlined here, and not currently on the UF web page.

violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Privacy and Accessibility Policies

- Instructure (Canvas)
 - [Instructure Privacy Policy](#)
 - [Instructure Accessibility](#)
- Zoom
 - [Zoom Privacy Policy](#)
 - [Zoom Accessibility](#)