CALS Curriculum Committee Meeting

December 14, 2018

2:00 p.m.

1044 McCarty Hall D

Members: J. Brendemuhl, J.C. Bunch, D. Coenen, D. Farnsworth, D. Gabriel, P. Inglett, S. Johnson, B. Kolaczkowski, A. Mathews, G. Nunez, B. Pearson, W. Porter, C. Prince, K. Rose, D. Rowland, S. Sager (Chair), C. Stefanou, L. Warren, J. Weeks, A. Wysocki

Agenda and Index for Materials

Approve Minutes from November 16, 2018 meeting

Dr. Brendemuhl: Update from UCC

Graduate New Course Proposals

1. PLP 6XXX – Impact through Networks (req. #13382)

2. PLS 5XXX – Upland Invasive Plant Management (req. #13330)

3. SWS 6XXX – Modeling Land Biogeochemistry (req. #13378)

CALS Curriculum Committee Meeting
November 16, 2018
Submitted by James Fant

Members Present: J. Brendemuhl, D. Coenen, P. Inglett (Acting Chair), S. Johnson, B. Kolaczkowski, A. Mathews, G. Nunez, B. Pearson, W. Porter, C. Prince, K. Rose, D. Rowland, C. Stefanou, J. Weeks

Substitutes: Rhiannon Pollard for S. Sager
Misti Sharp for D. Farnsworth

Guests: Chris Wilson and Emily Johnson

Call to Order: The College of Agricultural and Life Sciences Curriculum Committee met on November 16, 2018 in Rm. 1044 McCarty Hall D. Dr. Inglett called the meeting to order at 2:00 p.m.

Previous agenda items and supporting material can be found on the CALS Curriculum Committee homepage under document archives: http://cals.ufl.edu/faculty-staff/curriculum-committee.php

Approval of Minutes: A motion was made by Dr. Johnson to approve the minutes from the October 12, 2018 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.

Websites: Grades – https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx
Syllabus Statements – http://cals.ufl.edu/faculty-staff/docs/policies/CALS%20Syllabus%20Policy%202017-18.pdf
Absences & Make-Ups – https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Update from UCC: Dr. Brendemuhl noted the following items were acted upon at the UCC meeting on October 16th: A) New UG courses: 1) HOS 4XXX-Capstone Planning in Horticultural Sciences (approved); 2) HOS 4XXX-Genetics and Breeding of Vegetable Crops Production (approved); 3) HOS 4XXX-Horticultural Sciences Capstone (approved); 4) HOS 4XXX-Supervised Teaching Experience in Horticultural Sciences (tabled); 5) PLS 3XXXC-Hydroponic Systems (approved); B) Certificate Termination: 1) Personal and Family Financial Planning (approved); C) Proposed changes to UG courses: 1) HOS 3020C-Principles of Horticultural Crop Production (approved); and D) Proposed new joint course: 1) SWS 4XXX-Aquatic Toxicology:Science and Applications (approved). Dr. Brendemuhl indicated that the following items were on the UCC November 20th agenda: A) Proposed new joint courses: 1) ENY 4XXX Ecology and Conservation of Pollinators; 2) HOS 4XXX Organic weed Management; and 3) MCB 4XXX Probiotics. Other updates were similar to last month and included the new Compass releases and correcting degree audits. Work continues on SIDA

(Student-Initiated Drop/Add) and this is especially critical as the drop deadline is Monday, November 19th. He once again reminded members concerning trainings associated with various rollouts of UF COMPASS and to stay abreast and take the trainings. Lastly, there will be a call for course proposals for Quest 2 coming in the spring 2019.

Graduate Course Change Proposal

1. WIS 6557 – Wildlife Conservation Laws and Legislation (req. #12887)

A motion was made by Dr. Porter to approve this item with changes required. The motion was approved. The word "Policy" needs to be added to the title of the proposed syllabus. The course description in the syllabus must match the description on the UCC form and be limited to a maximum of 50 words. Any other information can be listed under a heading of About this Course or Course Information. In the first course goal listed in the syllabus plane needs to be changed to plan. Since the grading breakdown is given in points it was suggested that the grading scale be done in points as well. The makeup policy listed in the syllabus is not in line with university policy. For submission purposes it is best to refer only to the university policy (link already included in syllabus). This will help avoid the item being recycled at the next level of the approval process. The boilerplate including all required CALS syllabus statements needs to be included to replace the existing information at the back of the provided syllabus. This information can be found at: http://cals.ufl.edu/faculty-staff/docs/policies/CALS%20Syllabus%20Policy%202017-18.pdf.

Undergraduate Course Change Proposal

2. FYC 4941 – Practicum in Family, Youth, and Community Sciences (req. #13282)

A motion was made by Dr. Porter to approve this item with changes required. The motion was approved. The course description heading in the syllabus needs to be changed to course information. The proposed additional prerequisites need to be included in the syllabus. The late assignments policy listed in the syllabus is not in line with university policy. For submission purposes it is best to refer only to the university policy. This link needs to be included in the syllabus to address the issue: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx. The most up to date version of the required CALS syllabus statements needs to be included in the syllabus. This can be found at: http://cals.ufl.edu/faculty-staff/docs/policies/CALS%20Syllabus%20Policy%202017-18.pdf.

Recycled items

3. HOS 3XXX – Viticulture for Table Grapes and Wine (req. #13128)

A motion was made by Dr. Johnson to approve this item with changes required. The motion was approved. In the grading scheme on both the UCC form and in the syllabus the quizzes section needs to include 2 points each and the problem solving section needs 7.5 points each. In the midterm exam section 60 minutes needs to be changed to 50 minutes. In the final exam section 60 minutes should be changed to 50 minutes unless the exam is given during exam week.

4. Environmental Microbiology Graduate Certificate (req. #12418)

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

Discussion item

5. Review of CALS Guidelines for Writing Learning Objectives

It was decided that there will be a committee formed to review this policy and propose an updated version to be presented at a later meeting of the CALS CC. Members of this committee are as follows: Rhiannon Pollard, Gerardo Nunez, Jennifer Weeks, Kate Rose and Anne Mathews.

The meeting was adjourned at 2:50 p.m.

Cover Sheet: Request 13382

PLP6XXX Impact through Networks

Info

Process	Course|New|Grad
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Karen Garrett karengarrett@ufl.edu
Created	12/3/2018 12:16:06 AM
Updated	12/3/2018 5:45:40 PM
Description of request	Creation of new course

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Plant Pathology 514919000	Rosemary Loria		12/3/2018
No document changes					
College	Pending	CALS - College of Agricultural and Life Sciences			12/3/2018
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 13382

Info

Request: PLP6XXX Impact through Networks
Description of request: Creation of new course
Submitter: Karen Garrett karengarrett@ufl.edu
Created: 11/30/2018 2:04:19 PM
Form version: 1

Responses

Recommended Prefix PLP
Course Level 6
Number XXX
Category of Instruction Intermediate
Lab Code C
Course Title Impact through Networks
Transcript Title Impact thr Networks
Degree Type Graduate

Delivery Method(s) On-Campus
Co-Listing No
Co-Listing Explanation NA
Effective Term Fall
Effective Year 2019
Rotating Topic? No
Repeatable Credit? No

Amount of Credit 2

S/U Only? No
Contact Type Regularly Scheduled
Weekly Contact Hours 2
Course Description This course focuses on networks and the impact of system changes in agriculture, natural ecosystems, and health care, with an introduction to network science in the R programming environment, and review of applications in biological and social sciences. Students develop projects that apply network analysis to their own study systems.
Prerequisites General knowledge of agricultural, ecological, or epidemiological systems, at least two graduate or advanced undergraduate courses applying quantitative concepts and tools
Co-requisites None
Rationale and Placement in Curriculum This course is designed to give graduate students experience in applying network analysis to biological topics broadly speaking: agriculture, public health, and more. It integrates biological and social applications of network analysis, for students who are studying systems where management decisions are important. Students come away from the course with a project that may become part of their theses, and experience in interdisciplinary thinking.
Course Objectives Participants who have completed this course will be able to…

explain how networks are defined and applied in agriculture, ecology, and epidemiology
explain basic principles of impact analysis in these systems
broadly understand and discuss journal articles describing networks in these systems
evaluate dynamic networks and study processes in networks
collect data for characterizing networks and testing the fit of network models
apply network analysis to ask questions about their own systems using R

Course Textbook(s) and/or Other Assigned Reading Optional books are:
-Kolaczyk and Csárdi. 2014. Statistical Analysis of Network Data with R. Springer.
-Luke. 2015. A User's Guide to Network Analysis in R. Springer.
-Wickham & Grolemund. 2017. R for Data Science. O'Reilly.
Journal articles for discussion are identified in discussion with the class to match their interests, likely

including examples in plant disease epidemiology, human epidemiology, microbiomes, agricultural development, ecological networks, and seed systems
Weekly Schedule of Topics 1.Course overview, and examples of what can be done with skills from this class
2.Intro to R
3.Networks and adjacency matrices
4.Epidemic networks. Matrices and simple networks in R
5.Describing nodes in R. Microbiome networks
6.Social networks. Visualizing and describing networks in R
7.Networks of association in R. Networks and meta-populations in landscapes
8.Preparing project proposals. Statistical models of networks in R. Mathematical models of networks in R
9.Survey of other network types ('omics, economics, ecology, communication, etc.)

10.Proposal presentations
11.Exponential random graph models (ERGMs) in R
12.Value of information. Processes in networks
13.Multilayer networks
14.Impact assessment
15.Simulating scenarios
16.Bayesian networks in R
17.Final project presentations
Links and Policies Attendance and make-up policies

This is a synchronous course, to make the most of interactions among participants. Discussion among course participants is an important part of the learning experience, so attendance is required. Three course meetings can be missed without explanation (with the exception of dates when the participant has a particular responsibility, such as leading discussions or presenting). Please alert the instructor if there is a serious health problem or other emergency.

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.

Accommodations 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 should first register with the Disability Resource Center at 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/ and provide appropriate documentation.

On-line course evaluation

For this course, students will be asked to anonymously provide some more specific recommendations for making the course as useful and interesting as possible, in both a mid-term survey and a final survey. This will be in addition to the general UF course assessment.

UF Policy: 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.

Materials and supplies fees

None

UF Policy on 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:
http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

UF Policy on 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

The university's counseling resources are available for students experiencing personal problems that interfere with their general well-being and/or academic performance. The Counseling & Wellness Center provides confidential counseling services at no cost for students that are currently enrolled with the university.

- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu/cwc/
  - Counseling Services
  - Groups and Workshops
  - Outreach and Consultation
  - Self-Help Library
  - Training Programs
  - Community Provider Database

- Career Resource Center, First Floor JWRU, 352-392-1601, www.crc.ufl.edu/

Student complaints

If there is an issue in the course, please bring it to the instructor's attention. UF policies about more serious complaints are described in these documents.

- Residential Course: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf
- Online Course: http://www.distance.ufl.edu/student-complaint-process

Grading Scheme 20% Class discussions
20% Weekly quizzes and assignments
20% Project proposal
10% Journal article presentation and discussion
30% Final project

Brief quizzes covering recent course topics are given most weeks, to help participants keep up with the course material. The lowest three quiz scores will be dropped from the grade, so there is no option to make up quizzes.

The project proposal will give students an opportunity to show how they can apply the course concepts and tools to an area of particular interest to them. The project proposal is presented in class (approximately 15 minutes per student, depending on course enrollment), and covers a topic of

particular interest to an individual student, drawing on course material about network analysis. The project proposal outlines the analysis that the student will later present as the final project. The project proposal is evaluated based on a course rubric for proposal presentation.

Each participant will lead or co-lead a journal article discussion for the group. The discussion is evaluated based on a course rubric for leading article discussions.

Final projects will be presented and discussed in the class (approximately 20 minutes per student, depending on course enrollment). The final project builds on the material presented in the project proposal, including analyses of real data or simulated data provided for students to analyze when appropriate real data are not yet available. (For example, if a student is planning to collect a particular type of data in future semesters, the student could temporarily work with a similar simulated data set for purposes of this class project.) The final project is evaluated based on a course rubric for project presentation.

If the grade on an assignment appears incorrect, the process for requesting reconsideration of the grade is to prepare a written statement describing where the error lies, to be turned into the instructor within one week of receiving the grade.

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

Grading scale: 94-100 A; 90-93 A-; 87-89 B+; 84-86 B; 80-83 B-; 77-79 C+; 74-76 C;
70-73 C-; 67-69 D+; 64-66 D; 60-63 D-
Instructor(s) Karen Garrett

Impact through Networks

PLP 6xxx

2 credit hours

Class meetings: Tuesday and Thursday, Period 5 (11:45-12:35), 2564 Fifield Hall

Fall semester, 2019 and alternate years

Prerequisites

General knowledge of agricultural, ecological, or epidemiological systems, and at least two graduate or advanced undergraduate courses applying quantitative concepts and tools (such as courses addressing statistics, mathematics, or engineering)

Instructor: Dr. Karen A. Garrett (garrettlab.com)
Plant Pathology, Institute for Sustainable Food Systems, Emerging Pathogens Institute
Office: 2411 Fifield Hall
Email: karengarrett@ufl.edu
Phone: 352-273-9110

Course materials access: http://elearning.ufl.edu/

Office hours

By appointment in advance, 2-4 Tuesday and 3-5 Wednesday, or additional times as needed

Course overview

Outcomes in systems such as agriculture, natural ecosystems, and health care are often determined by processes that act through networks. Networks can describe the spread of pathogens, invasive species, consumer goods, ideas, and technologies. Networks can also describe associations, interactions, and transactions among people, species, and other agents. This course addresses how to analyze the impact of system changes in networks, such as the introduction of new species or new management techniques. This course provides an introduction to network science in the R programming environment, and a review of applications in biological and social sciences, including current methods used to evaluate impact. The course includes a combination of lectures to provide background information, discussion of current literature, computational analysis workshops to illustrate concepts, and individual projects to allow participants to apply ideas to systems that particularly interest them.

The course emphasizes concepts and use of existing tools, while at the same time it will offer a basis for the development of new tools for participants interested in further steps.

Course learning objectives

Participants who have completed this course will be able to…

- ❖ explain how networks are defined and applied in agriculture, ecology, and epidemiology
- ❖ explain basic principles of impact analysis in these systems
- ❖ identify and discuss key points in journal articles describing networks in these systems
- ❖ evaluate dynamic networks and study processes in networks
- ❖ collect data for characterizing networks that enable testing the fit of network models
- ❖ apply network analysis to ask questions about their own systems using R

Course outline (***as of October 9, 2018 – subject to change***)

Course assignments to be turned in or presented by students are indicated in bold

	Tues: often a short lecture and discussion of a paper	**Thurs**: often a short lecture and a workshop for network analysis in R
Week 1		First class: Course overview, and examples of what can be done with skills from this class
Week 2	Intro to R	Intro to R (**quiz**)
Week 3	Networks and adjacency matrices Epidemic networks	Matrices and simple networks in R Describing nodes in R (**quiz**)
Week 4	Microbiome networks	Visualizing and describing networks in R, part 1 (**quiz**)
Week 5	Social networks	Visualizing and describing networks in R, part 2 (**quiz**)
Week 6	Networks of association in R	Networks and meta-populations in landscapes (**quiz**)
Week 7	Preparing project proposals	Revisiting applications of networks in R (**quiz**)
Week 8	Statistical models of networks in R	Mathematical models of networks in R, part 1 (**quiz**)
Week 9	Survey of other network types ('omics, economics, ecology, communication, etc.)	Mathematical models of networks in R, part 2 (**quiz**)
Week 10	**Proposal presentations**	**Proposal presentations**
Week 11	**Proposal presentations**	Exponential random graph models (ERGMs) in R
Week 12	***Paper discussion***	***Paper discussion*** & Value of information
Week 13	***Paper discussion*** & Processes in networks	***Paper discussion*** & Multilayer networks

Week 14	***Paper discussion*** & Impact assessment Simulating scenarios	***---- Thanksgiving vacation***
Week 15	***Paper discussion*** & Bayesian networks in R	Topic: participant choice
Week 16	**Final project presentations**	

Grading

20% Class discussions
20% Weekly quizzes and assignments
20% Project proposal
10% Journal article presentation and discussion
30% Final project

Class discussions. When scientific papers are discussed, all participants will be expected to contribute to the discussion (even when not leading the discussion). When project proposals are presented, all participants are expected to contribute feedback for the projects.

Brief quizzes covering recent course topics are given most weeks, to help participants keep up with the course material. The lowest three quiz scores will be dropped from the grade; there is no option to make up quizzes.

The project proposal will give students an opportunity to show how they can apply the course concepts and tools to an area of particular interest to them. The project proposal is presented in class (approximately 15 minutes per student, depending on course enrollment), and covers a topic of particular interest to an individual student, drawing on course material about network analysis. The project proposal outlines the analysis that the student will later present as the final project. The project proposal is evaluated based on a course rubric for proposal presentation.

Each participant will lead or co-lead a journal article discussion for the group. The discussion is evaluated based on a course rubric for leading article discussions.

Final projects will be presented and discussed in the class (approximately 20 minutes per student, depending on course enrollment). The final project builds on the material presented in the project proposal, including analyses of real data or simulated data provided for students to analyze when appropriate real data are not yet available. (For example, if a student is planning to collect a particular type of data in future semesters, the student could temporarily work with a similar simulated data set for purposes of this class project.) The final project is evaluated based on a course rubric for project presentation.

If the grade on an assignment appears incorrect, the process for requesting reconsideration of the grade is to prepare a written statement describing where the error lies, to be turned into the instructor within one week of receiving the grade.

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Grading scale: 94-100 A; 90-93.99 A-; 87-89.99 B+; 84-86.99 B; 80-83.99 B-; 77-79.99 C+; 74-76.99 C; 70-73.99 C-; 67-69.99 D+; 64-66.99 D; 60-63.99 D-

Required course materials

There is no required textbook for this course. Journal articles for discussion will be provided to the class. The journal articles will be chosen in discussion with the participants who will be leading discussions, to represent the range of topics in the schedule above.

For network analysis in R, both of the following books are good references. It's recommended that course participants use at least one of these two books as a reference.

1. This one takes more of a statistical perspective, with more careful mathematical definitions and denser information:

Kolaczyk and Csárdi. 2014. Statistical Analysis of Network Data with R. Springer.

2. Luke has a lot of experience in public health applications, and writes more toward non-statisticians:

Luke. 2015. A User's Guide to Network Analysis in R. Springer.

Participants might be interested in the following book for reference, which provides much more information about general network applications than will be covered in this course:

Newman. 2010. Networks: An Introduction. Oxford University Press.

The following is a good reference on social networks, authored by UF's own Jeffrey C. Johnson:

Borgatti, Everett, and Johnson. 2013. Analyzing Social Networks. Sage Publications.

A good reference for data science in R is the following, with a lot of good information available at http://r4ds.had.co.nz/

Wickham & Grolemund. 2017. R for Data Science. O'Reilly.

A good general reference for R with many examples of statistical analysis:

Crawley. 2012. The R Book. Wiley.

Garrett's teaching philosophy

I think of teaching as a process that occurs in a network (of course). An individual could create a pretty good learning experience by finding a good set of books and papers on a topic, and trying out some R code on their own. However, this course is designed to offer a fuller experience and more efficient learning by linking participants to key literature, to relevant R packages, and to each other and the instructors through discussions and feedback. Engaging with a group of people interested in a topic can also be a lot of fun and boost creativity.

The course is designed to support participants in engaging with projects, rather than emphasizing testing. The quizzes are intended to provide some structure to help keep people up to date and engaged in the discussions. Most of the course activities will engage knowledge and creativity in developing projects. I will work to help each student develop a project that they will find useful in their current or future research.

Attendance and make-up policies

This is a synchronous course, to make the most of interactions among participants. Discussion among course participants is an important part of the learning experience, so attendance is required. Three course meetings can be missed without explanation (with the exception of dates when the participant has a particular responsibility, such as leading discussions or presenting). Please alert the instructor if there is a serious health problem or other emergency.

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:
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0001 Reid Hall, 352-392-8565, **www.dso.ufl.edu/drc/**

On-line evaluation of courses

UF Policy: 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.

Materials and supplies fees

None

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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: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

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Campus helping resources

Students experiencing crises or personal problems that interfere with their general wellbeing 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, www.counseling.ufl.edu/cwc/
    - Counseling Services
    - Groups and Workshops
    - Outreach and Consultation

    - Self-Help Library
    - Training Programs
    - Community Provider Database
- U Matter We Care, www.umatter.ufl.edu/
- Career Connections Center, First Floor JWRU, 392-1601, https://career.ufl.edu/

Student complaints

If there is an issue in the course, please bring it to the instructor's attention. UF policies about more serious complaints are described in these documents.

- Residential Course: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf
- Online Course: http://www.distance.ufl.edu/student-complaint-process

Cover Sheet: Request 13330

Proposed new course - Upland Invasive Plant Management (PLS 5XXX)

Info

Process	Course|New|Grad
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Gregory Macdonald pineacre@ufl.edu
Created	11/8/2018 12:16:56 PM
Updated	11/13/2018 3:04:10 PM
Description of request	The Agronomy department is revising curriculum in weed science for graduate students working in invasive plant management and this course material is currently not available. In addition this course will support the weed science certificate program being developed by the department and the Center for Aquatic and Invasive Plants

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Agronomy 514908000	Robert Gilbert		11/13/2018
Weed Science Certificate Courses Approval - R. Gilbert - Dept Approval for Uplands course.docx					11/8/2018
Proposed Syllabus PLS 5XXX - Upland Invasive Plant Management - revised.docx					11/8/2018
uccconsult - support for Upland Invasive Plant Management PLS 5xxx (2).pdf					11/8/2018
College	Pending	CALS - College of Agricultural and Life Sciences			11/13/2018
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 13330

Info

Request: Proposed new course - Upland Invasive Plant Management (PLS 5XXX)
Description of request: The Agronomy department is revising curriculum in weed science for graduate students working in invasive plant management and this course material is currently not available. In addition this course will support the weed science certificate program being developed by the
department and the Center for Aquatic and Invasive Plants
Submitter: Gregory Macdonald pineacre@ufl.edu
Created: 11/8/2018 10:43:12 AM
Form version: 1

Responses

Recommended Prefix PLS
Course Level 5
Number XXX
Category of Instruction Advanced
Lab Code None
Course Title Upland Invasive Plant Management
Transcript Title Upland Plant Mgmt
Degree Type Graduate

Delivery Method(s) Online
Co-Listing No
Co-Listing Explanation this course will not be co-listed
Effective Term Earliest Available
Effective Year Earliest Available
Rotating Topic? No
Repeatable Credit? No

Amount of Credit 3

S/U Only? No
Contact Type Regularly Scheduled
Weekly Contact Hours 3
Course Description This course will provide students with a better understanding of upland invasive plant management. Students will learn about upland plant ecosystems, focusing on the role and impacts of nuisance and exotic plants, and how to manage nuisance and invasive plants.
Prerequisites Botany (BOT 2010) and Plant Physiology (BOT 3503 or HOS 4304 or AGR 4512)
Co-requisites none
Rationale and Placement in Curriculum This course will valuable background information for our students working in natural area weed/invasive plant management. This course will also be a core component of the Weed Science certificate program that is currently under development through the Agronomy Department. It is envisioned that this course and certificate program will provide educational opportunities for students working in invasive plant management.
Course Objectives 1) Explain what differentiates an invasive plant from other species
2) Systematically assess the impact of invasive species on various upland habitats
3) Identify and differentiate several common invasive species and similar native species
4) Develop an appropriate management plan for invasive species and explain the process in a scientific and systematic approach.

Course Textbook(s) and/or Other Assigned Reading 1) A management guide for invasive plants in southern forests. 2013. Gen. Tech. Rep. SRS–131. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 120 p. Miller, James H., Manning, Steven T., Enloe, Stephen F. https://www.fs.usda.gov/treesearch/pubs/36915

2) Gregory E. MacDonald, Lyn A. Gettys, Jason A. Ferrell and Brent A. Sellers (June 12th 2013). Herbicides for Natural Area Weed Management, Herbicides, Andrew J. Price and Jessica A. Kelton, IntechOpen, DOI: 10.5772/56183. Available from: https://www.intechopen.com/books/herbicides-current-research-and-case-studies-in-use/herbicides-for-natural-area-weed-management

3) Integrated Management of Non-Native Plants in Natural Areas of Florida. Stephen F. Enloe, Ken Langeland, Jason Ferrell, Brent Sellers, and Greg MacDonald. Publication # SP242. http://edis.ifas.ufl.edu/wg209

4) Rejmanek, M., Richardson, D., Higgins, S.I., Pitcairn, M.J., Grotkopp, E. 2005. Ecology of invasive plants: state of the art. In Invasive Alien Species: a New Synthesis. Pp. 104-161. Available at: https://www.researchgate.net/publication/306201990_Ecology_of_invasive_plants_state_of_the_art

Weekly Schedule of Topics Week:

1 Introduction to Course
2 Brief Overview of Invasion theory by plants
3 Invasive Characteristics and Competition
4 Invasive Biology - Phenology
5 Invasive Biology – Propagule Physiology
6 Invasive Plants and Impacts - Xeric Ecosystems
7 Invasive Plants and Impacts - Mesic Ecosystems
8 Invasive Plants and Impacts - Hydric Ecosystems
9 Invasive Plants and Impacts - Anthropogenic Ecosystems
10 Overview of Management - Prevention and Biological Management Strategies
11 Mechanical and Fire Methodologies for Invasive Plant Management
12 Cultural/Restorative Management
13 Chemical Management – Labels, Regulations
14 Chemical Management - Herbicides, Mode of Action, Selectivity
15 Integrated Management Approaches

Links and Policies Course Evaluation: 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.

Student 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/

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: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

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- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu
  - Counseling Services
  - Groups and Workshops
  - Outreach and Consultation
  - Self-Help Library
  - Wellness Coaching
- U Matter We Care, www.umatter.ufl.edu/
- Sexual Assault Recovery Services (SARS)
- Student Health Care Center, 392-1161
- University Police Department - 392-1111 (or 9-1-1 for emergencies). 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 Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://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. http://teachingcenter.ufl.edu/

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

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

Software Use: All faculty, staff and students of the University of Florida 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, pledge to hold ourselves and peers to the highest standards of honesty and integrity.

Grading Scheme Assignment:

Percent of Grade:
Discussion Posts

10%
Weekly Assignments

15%
Assessment #1

15%

Assessment #2

17.5%
Assessment #3

17.5%
Term Paper

25%
Total:

100%

The following grading scale will be used in this class.

Point range (%)	Letter Grade	GPA Equivalent
93.0 – 100	A	4.00
90.0 – 92.9	A-	3.67
87.0 – 89.9	B+	3.33
83.0 – 86.9	B	3.00
80.0 – 82.9	B-	2.67
77.0 – 79.9	C+	2.33
73.0 – 76.9	C	2.00
70.0 – 72.9	C-	1.67
67.0 – 69.9	D+	1.33
63.0 – 66.9	D	1.00
60.0 – 62.9	D-	0.67
< 60	E	0

Instructor(s) Gregory E. MacDonald & to be determined

UF UNIVERSITY of FLORIDA

Institute of Food and Agricultural Sciences
Agronomy Department
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3105 McCarty Hall
Gainesville, FL 32611-0500

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ragilber@ufl.edu
http://agronomy.ifas.ufl.edu

November 8, 2018

CALS Curriculum Committee

Dear CALS Curriculum Committee,

The Agronomy Department is developing a weed science certificate program at the graduate level. As part of this effort it was decided at a recent teaching program retreat to modify courses in our department. We proposed new course (PLS 5xxx) entitled Upland Invasive Plant Management, which is a graduate level course. This course will also be critical component of the Weed Science certificate program that is currently under development by our department. Since we envision the certificate for graduate and post-baccalaureate, we propose a new course at the 5000 level.

The Agronomy Department supports this proposed course, and would like it to be considered by the CALS Curriculum Committee.

Sincerely,

Robert Gilbert

Dr. Robert Gilbert
Professor and Chair
Agronomy Department

External Consultation Results (departments with potential overlap or interest in proposed course, if any)

Department	Name and Title
Center for Aquatic & Invasive Plants	Jason Ferrell - Professor and Director
Phone Number	**E-mail**
352-392-9613	jferrell@ufl.edu

Comments

The Center for Aquatic & Invasive Plants fully supports the new course entitled "Upland Invasive Plant Management". This course will be core component of the Weed Science certificate program that is currently under development through the Agronomy Department and the center. It is envisioned that this course and certificate program will provide educational opportunities to state and federal stakeholders that work closely with invasive plant management.

Department	Name and Title
Phone Number	**E-mail**

Comments

Department	Name and Title
Phone Number	**E-mail**

Comments

Upland Invasive Plant Management

PLS 5xxx

Agronomy Department - University of Florida

Fall Semesters

Instructors:

Greg MacDonald
Office - 2059 McCarty Hall-D
Email – pineacre@ufl.edu
Office phone – 352-294-1594
Cell – 352-262-8393

Class Schedule:

This is an online course, but **NOT** a go-at-your-own-pace course. Students are expected to watch the lectures and complete the accompanying assignments during their assigned week. Weekly assignments (quizzes, discussion posts, etc.) will be due by 11:55 PM on Sunday of each week.

Course Website:

Course material and communication will be provided through the Canvas site at http://lss.at.ufl.edu

Course Description:

This ***3 credit*** course will provide students with a better understanding of invasive plant management in upland environments. Students will learn about upland ecosystems, the biology and ecology of invasive plant species, and how to manage invasive species using chemical, mechanical, cultural, biological, and preventative methods. This online course has a lecture and lab component. In the lab component of the course, students will learn methods of invasive plant control and plant identification through video demonstrations and interviews.

Course Prerequisites:

Required - Botany (BOT 2010) and Plant Physiology (BOT 3503, HOS 4304 or AGR 4512). Introductory ecology (PCB 4043c) helpful but not required.

Course Objectives:

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

1) Explain what differentiates an invasive plant from other species
2) Systematically assess the impact of invasive species on various upland habitats
3) Identify and differentiate several common invasive species and similar native species
4) Develop an appropriate management plan for invasive species and explain the process in a scientific and systematic approach.

Office Hours: By appointment – send an email to schedule a time. For those students located off-campus, phone or video conference will be arranged.

Class Participation: Students are expected to participate in discussion boards with other students and the instructors/TA's. For every discussion assignment, students will be expected to respond to two other classmates.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Textbooks: No textbook required, but required readings will include:
1) A management guide for invasive plants in southern forests. 2013. Gen. Tech. Rep. SRS–131. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 120 p. Miller, James H., Manning, Steven T., Enloe, Stephen F.
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https://www.intechopen.com/books/herbicides-current-research-and-case-studies-in-use/herbicides-for-natural-area-weed-management

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https://www.researchgate.net/publication/306201990_Ecology_of_invasive_plants_state_of_the_art

Assessments and Grading: There will be three broad categories of graded assignments in this course:

1. **Weekly Assignments:** These assignments build on the content of that week's lectures and/or lab, and will primarily take the form of short-

answer questions or class discussions. For the weeks where plant identification and calibration are discussed, assignments will take the form of multiple-choice quizzes.

2. **Exams:** There will be three exams.

3. **Term Paper:** A term paper will be required where students will be given an upland invasive plant scenario and are required to develop a management plan. More information on project requirements and grading will be provided through the course website on Canvas.

Assignment:	Percent of Grade:
Discussion Posts	10%
Weekly Assignments	15%
Assessment #1	15%
Assessment #2	17.5%
Assessment #3	17.5%
Term Paper	25%
Total:	**100%**

Course Grading Scale:

For University of Florida grading policy see:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

The following grading scale will be used in this class.

Point range (%)	Letter Grade	GPA Equivalent
93.0 – 100	A	4
90.0 – 92.9	A-	3.67
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83.0 – 86.9	B	3
80.0 – 82.9	B-	2.67
77.0 – 79.9	C+	2.33
73.0 – 76.9	C	2
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  - *Groups and Workshops*
  - *Outreach and Consultation*
  - *Self-Help Library*
  - *Wellness Coaching*
- *U Matter We Care, www.umatter.ufl.edu/*
- *Sexual Assault Recovery Services (SARS)*
- *Student Health Care Center, 392-1161*
- *University Police Department - 392-1111 (or 9-1-1 for emergencies). http://www.police.ufl.edu/*

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Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://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. http://teachingcenter.ufl.edu/

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

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Class Outline:

Week:	Lecture:	Practical Applications:	Assignment:
1	Introduction to Course	Readings on Invasive Impacts	Discussion Post
2	Brief Overview of Invasion theory by plants	Sources of Introduction	Discussion Post
3	Invasive Characteristics and Competition	Mechanisms of Competition/Spread	Competition Assignment
4	Invasive Biology - Phenology	Introduction to Invasive Plant ID and Sources	Discussion of Online Sources
5	Invasive Biology – Propagule Physiology	Annuals and Short-lived Perennials	Plant Identification Quiz
6	Invasive Plants and Impacts- Xeric Ecosystems	Perennial Rhizomatous Graminoids	Test 1 Weeks 1-5 Lecture Material
7	Invasive Plants and Impacts- Mesic Ecosystems	Ferns and Vines	Plant Identification Quiz
8	Invasive Plants and Impacts- Hydric Ecosystems	Shrubs and Trees	Plant Identification Quiz
9	Invasive Plants and Impacts Anthropogenic Ecosystems	none	Test 2 Weeks 6-9 Lecture Material
10	Overview of Management Prevention and Biological Management Strategies	Management Philosophies and Strategies	Discussion Post
11	Mechanical and Fire Methodologies for Invasive Plant Management	Mechanical Equipment and Fire	Fire Management Plan
12	Cultural/Restorative Management	Active Restoration Technologies	Restoration Plan
13	Chemical Management – Labels, Regulations	Calibration and Equipment	Calibration Quiz
14	Chemical Management - Herbicides, Mode of Action, Selectivity	Application Techniques	Test 3 Weeks 10-14 Lecture Material
15	Integrated Management Approaches	Case Studies - Theoretical vs. Practical	Discussion Post

Cover Sheet: Request 13378

SWS 6XXX - Modeling Land Biogeochemistry

Info

Process	Course|New|Grad
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Michael Sisk mjsisk@ufl.edu
Created	11/29/2018 3:28:14 PM
Updated	11/29/2018 3:44:57 PM
Description of request	New Graduate Course in Soil and Water Sciences Department

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Soil and Water Science 514921000	Thomas Obreza		11/29/2018
SWS_6XXX_Modeling_Land_Biogeochemistry_11_29_18.pdf UCC_External_Consult_Completed_EES_11_29_18.pdf					11/29/2018 11/29/2018
College	Pending	CALS - College of Agricultural and Life Sciences			11/29/2018
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 13378

Info

Request: SWS 6XXX - Modeling Land Biogeochemistry
Description of request: New Graduate Course in Soil and Water Sciences Department
Submitter: Michael Sisk mjsisk@ufl.edu
Created: 11/29/2018 3:17:34 PM
Form version: 1

Responses

Recommended Prefix SWS
Course Level 6
Number XXX
Category of Instruction Intermediate
Lab Code None
Course Title Modeling Land Biogeochemistry
Transcript Title Modeling Land Biogeoc
Degree Type Graduate

Delivery Method(s) On-Campus
Co-Listing No
Co-Listing Explanation N/A
Effective Term Earliest Available
Effective Year Earliest Available
Rotating Topic? No
Repeatable Credit? No

Amount of Credit 3

S/U Only? No
Contact Type Regularly Scheduled
Weekly Contact Hours 3
Course Description A modeling course that addresses the flow of water, carbon and nutrients from an Earth system perspective
Prerequisites BSC 3307C or COP 3272 or MAC 2233 or PHY 2048 or SWS 4180 or ABE 5643C or PCB 5358 or SWS 5182 or SWS 5224
Co-requisites N/A
Rationale and Placement in Curriculum Large scale models are critical tools to address global environmental challenges from climate change, water resources and eutrophication. This course provides insights into these modeling tools for students who want to pursue environmental modeling in the future and for students who are interested in aligning their research to further develop and improve these earth system models. This course will be complementary to other courses in the SWSD curriculum, filling an emerging need for a more global focus within our discipline.
Course Objectives By the end of this course, students will be able to

- Describe processes represented in a dynamic global land model
- Apply and evaluate global land models for global change and biogeochemistry research
- Describe linkages between land carbon cycles, water cycles, and climate
- Assess restrictions and limitations of mechanistic land surface model

Course Textbook(s) and/or Other Assigned Reading Course text:
Reading assignments will be available on the course website https://elearning.ufl.edu/ in form of scientific papers (see also references below the course schedule). Optional, further reading include the following titles

- Bonan G, Ecological Climatology, 2002, Cambridge University Press
- Climate Change 2013 - The Physical Science Basis Contribution of Working Group I to the Fifth Assessment Report of the IPCC (available online www.ipcc.ch)
- Jacobson M.C. et al., 2000, Earth System Science from Biogeochemical Cycles to Global Change

Full reference of reading (papers)

Beedlow, P. A., D. T. Tingey, D. L. Phillips, W. E. Hogsett, and D. M. Olszyk. 2004. Rising atmospheric CO2 and carbon sequestration in forests. Frontiers in Ecology and the Environment 2:315–322.
Farquhar, G. D., S. Caemmerer, and J. A. Berry. 1980. A biochemical model of photosynthetic CO2 assimilation in leaves of C3 species. Planta 149:78–90.
Fisher, R. A., C. D. Koven, W. R. L. Anderegg, B. O. Christoffersen, M. C. Dietze, C. E. Farrior, J. A. Holm, et al. 2018. Vegetation demographics in Earth System Models: A review of progress and priorities. Global Change Biology 24:35–54.
Friedlingstein, P., M. Meinshausen, V. K. Arora, C. D. Jones, A. Anav, S. K. Liddicoat, and R. Knutti. 2013. Uncertainties in CMIP5 Climate Projections due to Carbon Cycle Feedbacks. Journal of Climate 27:511–526.
Gerten, D., S. Schaphoff, U. Haberlandt, W. Lucht, and S. Sitch. 2004. Terrestrial vegetation and water balance—hydrological evaluation of a dynamic global vegetation model. Journal of Hydrology 286:249–270.
Haxeltine, A., and I. C. Prentice. 1996. A general model for the light-use efficiency of primary production. Functional Ecology 10:551–561.
Lenton, T. M. 2000. Land and ocean carbon cycle feedback effects on global warming in a simple Earth system model. Tellus B 52:1159–1188.
Leuning, R. 1995. A critical appraisal of a combined stomatal-photosynthesis model for C3 plants. Plant, Cell and Environment 18:339–355.
Lloyd, J., and J. A. Taylor. 1994. On the temperature dependence of soil respiration. Functional Ecology 8:315–323.
Parton, W., W. L. Silver, I. C. Burke, L. Grassens, M. E. Harmon, W. S. Currie, J. Y. King, et al. 2007. Global-scale similarities in nitrogen release patterns during long-term decomposition. Science 315:361–364.
Sitch, S., B. Smith, I. C. Prentice, A. Arneth, A. Bondeau, W. Cramer, J. O. Kaplan, et al. 2003. Evaluation of ecosystem dynamics, plant geography and terrestrial carbon cycling in the LPJ dynamic global vegetation model. Global Change Biology 9:161–185.
Thonicke, K., S. Venevsky, S. Sitch, and W. Cramer. 2001. The role of fire disturbance for global vegetation dynamics: coupling fire into a Dynamic Global Vegetation Model. Global Ecology & Biogeography 10:661–677.

Weekly Schedule of Topics Course Parts and Schedule

Note that the schedule is approximate, and pace may vary.

Week Topic Technical Work Assignments Reading

1-2 Introduction / scope of land surface model Programming in Linux Environment Programming Structures - Program "Hello World"

- Concept Map "global change on the land surface" Beedlow et al., 2004 Friedlingstein, 2014

3 Flow of carbon in the land surface Development cycle (coding, compiling, and testing)

- Track carbon in a complex land surface model

- Evaluate your carbon cycle model Sitch et al., 2003 Lenton et al., 2000

4-5 Photosynthesis theory and models Learning to apply a complex land surface model and working with its output - Derive mathematical formulation of C4 photosynthesis

- Modify photosynthesis code using alternate mathematical formulation Farquhar et al., 1980 Haxeltine and Prentice, 1996

6 Canopy carbon, water, and energy balance Parameter sensitivity testing

- Group Work: modify parameter in Earth System Model to find maximum rate of plant photosynthesis Leuning 1995

7-8 Water balance Analyzing, and displaying 3D data - Flipped Class: teach the concepts of water flow in a land surface model

- Group Work: minimize modeled runoff globally Gerten et al., 2004

9-10 Soil organic matter Data – model comparison - Discuss residence times of carbon in terrestrial systems

- Group work: minimize data-model mismatch in soil organic carbon Parton et al., 2007 Lloyd and Taylor, 1994

11-12 Plant Traits and Functional Types / Fire - - Group Work: engineer a hyper successful plant Fisher et al, 2018 Thonicke et al, 2001

13-14 Final Project - Final oral presentation
- Final paper

Links and Policies For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx
Attendance and Make-Up Work
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.
Online Course Evaluation Process
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Counseling Services
Groups and Workshops
Outreach and Consultation
Self-Help Library
Wellness Coaching

- U Matter We Care, www.umatter.ufl.edu/

- Career Connections Center, First Floor JWRU, 392-1601, https://career.ufl.edu/.

Student Complaints:
- Residential Course: https://sccr.dso.ufl.edu/
- Online Course: http://www.distance.ufl.edu/student-complaint-process

Grading Scheme Letter Grade Sum of % Points (p)

A	95	
A-	90	p < 95
B+	85	p <90
B	80	p < 85
B-	75	p < 80
C+	70	p < 75
C	65	p < 70
C-	60	p < 65
D+	55	p < 60
D	50	p < 55
D-	45	p < 50
E	< 45	

Course Maximum % Points

Individual Assignments	35
Group Work	35
Final Project/Report	15
Final Oral Presentation	15

Instructor(s) Stefan Gerber
3179 McCarty Hall
Phone: 352-294-3174
sgerber@ufl.edu

External Consultation Results (departments with potential overlap or interest in proposed course, if any)

Department	Name and Title
Environmental Engineering Sciences	Chang-Yu Wu, Professor & Dept Head
Phone Number	**E-mail**
352-392-0845	cywu@ufl.edu

Comments

Environmental Engineering Sciences Department supports this new course. We do not see overlap with our existing courses.

Department	Name and Title
Phone Number	**E-mail**

Comments

Department	Name and Title
Phone Number	**E-mail**

Comments

SWS 6XXX - Modeling Land Biogeochemistry

Catalogue Description A modeling course that addresses the flow of water, carbon and nutrients from an Earth system perspective

Term	Spring 2019
Meeting Time	Tuesday Period 4-5 (10:40am – 12:35pm); MCCB 3086 (Computer Lab)
	Thursday Period 4 (10:40am – 11:30 pm); MCCB 3086 (Computer Lab)
Credits	3
Instructor	Stefan Gerber
	3179 McCarty Hall
	Phone: 352-294-3174
	sgerber@ufl.edu
Office hours	Thursday 12:30pm to 2:30 pm or by appointment

Course Prerequisite: A course that addresses ecosystem ecology, quantitative ecology/biogeochemistry and/or theory of carbon water and nutrient flow in a terrestrial system is required at 3000 level or higher (e.g. SWS 4180, SWS 5182, SWS 5224, PCB 5358, BSC 3307C, ABE 5643C, etc.) A minimal proficiency of calculus (e.g. MAC 2233: Survey of Calculus 1; PHY 2048 Physics with Calculus 1, or similar), as well as some programming experience in a basic computer language such as C or FORTRAN (e.g. COP3272: Programming using C) is advantageous but not a requirement.

Course Description

Dynamic land models or land surface models are widely used as part of larger Earth system models and serve to represent exchange of energy (heat radiation momentum), water, carbon, and nutrients between land and the atmosphere/ocean system. We will investigate how these land models interact with the atmosphere and help with climate predictions. We further explore how biological processes are formulated mathematically to capture the broad range of plant functioning on a regional to global scale. We will particularly address how such processes are represented and resolved in a model code. We will take a look under the hood of such a model by boldly modifying the source code, thereby get a feel for the development/application cycle. We will then make use of a land surface model to explore effects global environmental change on vegetation and land surface dynamics.

Objectives

By the end of this course, students will be able to

- Describe processes represented in a dynamic global land model
- Apply and evaluate global land models for global change and biogeochemistry research
- Describe linkages between land carbon cycles, water cycles, and climate
- Assess restrictions and limitations of mechanistic land surface model

Course Format

3 credit course where contact hours are divided into a two hour and one hour period per week. The weights of lecture, computer lab and discussion shift during the semester with focus on lectures initially, and moving towards labs and discussions with the progression of the semester.

Course text:

Reading assignments will be available on the course website https://elearning.ufl.edu/ in form of scientific papers (see also references below the course schedule). Optional, further reading include the following titles

- Bonan G, Ecological Climatology, 2002, Cambridge University Press
- Climate Change 2013 - The Physical Science Basis Contribution of Working Group I to the Fifth Assessment Report of the IPCC (available online www.ipcc.ch)
- Jacobson M.C. et al., 2000, Earth System Science from Biogeochemical Cycles to Global Change

Course Parts and Schedule

Note that the schedule is approximate, and pace may vary.

Week	Topic	Technical Work	Assignments	Reading
1-2	Introduction / scope of land surface model	Programming in Linux Environment Programming Structures	-Program "Hello World" -Concept Map "global change on the land surface"	Beedlow et al., 2004 Friedlingstein, 2014
3	Flow of carbon in the land surface	Development cycle (coding, compiling, and testing)	-Track carbon in a complex land surface model -Evaluate your carbon cycle model	Sitch et al., 2003 Lenton et al., 2000
4-5	Photosynthesis theory and models	Learning to apply a complex land surface model and working with its output	-Derive mathematical formulation of C4 photosynthesis -Modify photosynthesis code using alternate mathematical formulation	Farquhar et al., 1980 Haxeltine and Prentice, 1996
6	Canopy carbon, water, and energy balance	Parameter sensitivity testing	-Group Work: modify parameter in Earth System Model to find maximum rate of plant photosynthesis	Leuning 1995
7-8	Water balance	Analyzing, and displaying 3D data	-Flipped Class: teach the concepts of water flow in a land surface model	Gerten et al., 2004

			- Group Work: minimize modeled runoff globally	
9-10	Soil organic matter	Data – model comparison	- Discuss residence times of carbon in terrestrial systems - Group work: minimize data-model mismatch in soil organic carbon	Parton et al., 2007 Lloyd and Taylor, 1994
11-12	Plant Traits and Functional Types / Fire	-	- Group Work: engineer a hyper successful plant	Fisher et al, 2018 Thonicke et al, 2001
13-14	Final Project		- Final oral presentation - Final paper	

Full reference of reading (papers)

Beedlow, P. A., D. T. Tingey, D. L. Phillips, W. E. Hogsett, and D. M. Olszyk. 2004. Rising atmospheric CO2 and carbon sequestration in forests. Frontiers in Ecology and the Environment 2:315–322.

Farquhar, G. D., S. Caemmerer, and J. A. Berry. 1980. A biochemical model of photosynthetic CO2 assimilation in leaves of C3 species. Planta 149:78–90.

Fisher, R. A., C. D. Koven, W. R. L. Anderegg, B. O. Christoffersen, M. C. Dietze, C. E. Farrior, J. A. Holm, et al. 2018. Vegetation demographics in Earth System Models: A review of progress and priorities. Global Change Biology 24:35–54.

Friedlingstein, P., M. Meinshausen, V. K. Arora, C. D. Jones, A. Anav, S. K. Liddicoat, and R. Knutti. 2013. Uncertainties in CMIP5 Climate Projections due to Carbon Cycle Feedbacks. Journal of Climate 27:511–526.

Gerten, D., S. Schaphoff, U. Haberlandt, W. Lucht, and S. Sitch. 2004. Terrestrial vegetation and water balance—hydrological evaluation of a dynamic global vegetation model. Journal of Hydrology 286:249–270.

Haxeltine, A., and I. C. Prentice. 1996. A general model for the light-use efficiency of primary production. Functional Ecology 10:551–561.

Lenton, T. M. 2000. Land and ocean carbon cycle feedback effects on global warming in a simple Earth system model. Tellus B 52:1159–1188.

Leuning, R. 1995. A critical appraisal of a combined stomatal-photosynthesis model for C3 plants. Plant, Cell and Environment 18:339–355.

Lloyd, J., and J. A. Taylor. 1994. On the temperature dependence of soil respiration. Functional Ecology 8:315–323.

Parton, W., W. L. Silver, I. C. Burke, L. Grassens, M. E. Harmon, W. S. Currie, J. Y. King, et al. 2007. Global-scale similarities in nitrogen release patterns during long-term decomposition. Science 315:361–364.

Sitch, S., B. Smith, I. C. Prentice, A. Arneth, A. Bondeau, W. Cramer, J. O. Kaplan, et al. 2003. Evaluation of ecosystem dynamics, plant geography and terrestrial carbon cycling in the LPJ dynamic global vegetation model. Global Change Biology 9:161–185.

Thonicke, K., S. Venevsky, S. Sitch, and W. Cramer. 2001. The role of fire disturbance for global vegetation dynamics: coupling fire into a Dynamic Global Vegetation Model. Global Ecology & Biogeography 10:661–677.

Grading System

Grading consists of individual assignments, group work and an individual final project. Throughout the semester, students will work on individual homework assignments that range from preparation for discussion to synthesizing the materials taught, with typically one assignment due each week. Additional graded assignments are group projects, where students will explore model features in more detail. Important: Grading will focus less on specific results, but assessment of the student's work will be more evaluated based on critical examination of the task and the material. Active participation and willingness to experiment is a must. The final project broadly entails some work with a land surface model, which can include model tests, scenarios, model improvements and/or further model development, and can (not necessarily required) be tailored to the student's graduate degree topic. The result of the final project will be communicated through a detailed written report, and a broader oral presentation.

Assignments turned in late results in a loss of half of the maximum points, unless late turn-in is caused by excused absences.

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For information on current UF policies for assigning grade points, see
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Attendance and Make-Up Work

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

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