CONSEQUENCES OF BIOLOGICAL INVASIONS
ALS 4162/6935
3 CREDITS
SPRING 2024

INSTRUCTOR INFORMATION

Instructor
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GENERAL INFORMATION

Course Description
This course provides an overview of non-native species invasions and the environmental effects of these invaders. Students will acquire a working knowledge of important global invaders and develop critical thinking skills for assessing the consequences of biological invasions. According to Pimentel (2011), the invasion of non-native species into new ecosystems is accelerating as the world's human population multiplies and goods are transported ever more rapidly on an increasing global scale. The impact of these invasive species is second only to that of human population growth and associated activities as a cause of the loss of biodiversity throughout the world. In this course, a number of important invasive species representing a range of taxa will be examined from a global perspective.

Course Objectives
After completing this course, students will be able to:
1. Appreciate the global economic costs and environmental impacts of biological invasions.
2. Describe the principles and basic practices of pest exclusion, eradication, and management tactics for biological invaders from six continents.

3. Assimilate information on biological invaders and identify general trends from case study examples.

COURSE REQUIREMENTS

Required Textbook
- **Biological Invasions: Economic and Environmental Costs of Alien Plant, Animal and Microbe Species. David Pimentel (ed.)., 2002, ISBN# 0-8493-0836-4, CRC Press.**
  - This book can be purchased at the UF bookstore, or through various online vendors. It is also available as an eBook at http://site.ebrary.com/lib/univflorida/docDetail.action?docID=10143770.
- **Biological Invasions: Economic and Environmental Costs of Alien Plant, Animal and Microbe Species, 2nd Edition. David Pimentel (ed.)., 2011, ISBN# 978-1-4398-2990-5, CRC Press.**
  - This book can be purchased at the UF bookstore or through various online vendors. It is also available as an eBook at http://site.ebrary.com/lib/univflorida/docDetail.action?docID=10473079.
  - Note: In order to access the free ebooks of David Pimentel's two editions of Biological Invasions, students need to be on VPN, VDI, or using a UF computer.
  Go to https://vpn.ufl.edu/+CSCOE+/logon.html. and login OR
  Go to https://vdi.ifas.ufl.edu/portal/webclient/index.html#/.
- **Invasive and Introduced Plants and Animals: Human Perceptions, Attitudes and Approaches to Management. Ian D. Rotherham and Robert A Lambert (eds.), 2011, ISBN# 978-1-84971-071-8, Earthscan Ltd, London.**
  - This book can be purchased at the UF bookstore, or through various online vendors. It is also available as an eBook at http://lib.myilibrary.com/ProductDetail.aspx?id=419980.

Prerequisites
- Integrated Principles of Biology 1 and Laboratory (BSC 2010 and 2010L)
- Integrated Principles of Biology 2 and Laboratory (BSC 2011 and 2011L) or equivalent

Minimum Technology Requirements
The University of Florida expects students entering an online program to acquire computer hardware and software appropriate to their degree program. Most computers can meet the following general requirements. A student's computer configuration should include:
- Webcam
- Microphone
- Broadband connection to the internet and related equipment (cable/DSL modem)
- Microsoft Office Suite installed (provided by the university)

Individual colleges may have additional requirements or recommendations, which students should review before starting their program.

Minimum Technical Skills
To complete your tasks in this course, you will need a basic understanding of operating a computer and using word processing software.

Materials/Supply Fees
There is no supply fee for this course.

Honorlock
Honorlock is an online proctoring service that allows students to take exams on-demand 24/7. There are no scheduling requirements or fees. You will need a laptop or desktop computer with a webcam, a microphone, and a photo ID. The webcam and microphone can be either integrated or external USB devices. Honorlock requires that you use the Google Chrome browser and that you must add the Honorlock extension to Chrome. For further information, FAQs, and technical support, please visit Honorlock.

Zoom
Zoom is an easy-to-use video conferencing service available to all UF students, faculty, and staff that allows for meetings of up to 100 participants. You can find resources and help using Zoom at the University of Florida's Zoom website.

STUDENT ASSESSMENT

Student assessments will be based on performance in quizzes, exams, and article reviews and discussions, and a weed risk assessment. Graduate students, in addition, are required to complete a Citrus Greening Training Module.

Examinations
There are 4 Exams; the first 3 are divided by course content, while the 4th is a comprehensive final. All examinations will be 50 questions, multiple choice, and each is worth 100 points.
- Exam #1: Modules 1 through 4
- Exam #2: Modules 5 through 8
- Exam #3: Modules 9 through 12
- Exam #4: Modules 1 through 13, comprehensive final exam

Each exam will be made available and accessible in Canvas from 8:00 a.m. EST on Wednesday through to 11:59 p.m. EST on Sunday of the exam week. You must have a Gatorlink account to access the exams. The exams are proctored using Honorlock. This requires Google Chrome and the Honorlock Chrome Extension. The computer being used must have a camera, and no outside materials or notes are allowed during the exam. You will be asked to lock your browser. You may not cut and paste information or consult

current or former students for answers. There is a time limit for the exams, and once you begin the exam, you will have 60 minutes to complete it in a single session, so do not open the exam until you are ready to complete it. On average, the exams take about 50 minutes to complete. Grades will be posted immediately following the exam using the e-learning grade book.

Quizzes

There are 13 quizzes (5 points each) throughout the course. The quizzes will consist of 5 questions. The quizzes will be made available and accessible in Canvas from 8:00 a.m. EST on Wednesday through to 11:59 p.m. EST on Sunday of the quiz week. Once you begin the quiz, you will have 7 minutes to complete it in a single session, so do not open it until you are ready. There are 13 quizzes throughout the semester but your two lowest quiz scores for the semester will be dropped, and your grade for the quiz component will be based on the best 11 of 13 quizzes.

Article Reviews and Discussions

The discussions are hosted in Perusall and Canvas.

Discussion in Perusall

Each module will have a selected reading for students to annotate and discuss with each other. Each Perusall discussion will be worth 10 points.

Discussion in Canvas

Students will also be grouped randomly into groups of about 10 to discuss the article and module topic in Canvas. Each student in each group is required to share at least one peer-reviewed article or news article that addresses the same topic as the article and module topic with other students for discussions. Students are also required to respond to at least two of their peers' submissions. Each Canvas discussion will be worth 10 points.

Weed Risk Assessment Report

All students are required to fill in the columns (Y/N/UNK) to the best of their ability, provide resources for their answer in the "Resources" column, and provide the excerpt of data from the source in the "Source Data" column. After receiving the score which should auto-complete in the Excel spreadsheet, students should write in the "More Info" box whether they should accept, reject, or study further based on that score. Additionally, a sentence or two should be written to support or explain this answer.

Citrus Greening – Graduate Students Only

Graduate students are required to complete the Citrus Greening Training Module. This ios in four parts. More information is on the assignment page in Canvas. The instructor and/or the TAs will also provide more information about the assignment.

Participation

Students will receive participation points for watching lecture videos in PlayPosit. Make you that you watch these videos until the very end to receive points. Each Module's PlayPosit value is worth 5 points, totaling 65 points.

Extra Credit

No extra credits are offered for the course, but the points for the Discussion assignments do add up. Students are advised to submit posts even if they are late for at least a few points.

Assignment Make-Up Policy

Make-up for an assignment will be allowed only for illness, emergencies, or prescheduled reasons. In the event of a missed assignment, you must provide the necessary written documentation, such as a note from a doctor in case of severe illness or a funeral notice/obituary in case of the death of a close relative. Any other kind of conflicting commitment should be communicated to the instructor at least a week in advance. Requests to take an assignment late WITHOUT one of the reasons listed above will be considered but will automatically result in 5% of the points being deducted from the assignment score.

COURSE SCHEDULE

Module	Topic/Activity	Reading	Assessments
1	**Module 1 - Course Introduction, World Overview of Invasive Species** • Course Introduction • Navigating Canvas • Review of Syllabus • The Importance of Invasive Species to Florida's Natural Areas • Introduction: Non-native Species in the World	• Pimentel Chapter 1, 2nd edition	• Practice navigating Canvas • Course Orientation Quiz • Introduce Yourself! • Discussion 1 (Perusall and Canvas) • Quiz 1
2	**Module 2 - Invasive Species of Australian Continent: Weeds and Vertebrates** • The Impacts of Alien Plants in Australia • Environmental and Economic Costs of Invertebrate Invasions in Australia	• Pimentel Chapters 2 and 3, 2nd edition	• Discussion 2 (Perusall and Canvas) • Quiz 2
3	**Module 3 - Invasive Species of Australian Continent: Australian Vertebrates and Weeds in New Zealand** • Non-Indigenous Vertebrates in Australia	• Pimentel Chapter 3, 1st edition • Pimentel Chapter 12, 2nd edition	• Discussion 3 (Perusall and Canvas) • Quiz 3
4	**Module 4 - Invasive Species of Australian Continent: Invertebrates in New Zealand**	• Pimentel Chapter 12, 1st edition	• Discussion 4 (Perusall and Canvas) • Quiz 4

	• Alien Invertebrates in New Zealand • Ecological and Economic Costs of Alien Vertebrates in New Zealand	• Pimentel Chapter 13, 2nd edition	• Citrus Greening Training Module Part 1 (Graduate Students only)
5	**Module 5 - British Isles and Europe: British Weeds, Arthropods, and Plant Pathogens** • Alien Plants in Britain • Non-native Invasive Species of Arthropods and Plant Pathogens in the British Isles	• Pimentel Chapter 5, 2nd edition • Pimentel Chapter 8, 1st edition	• Discussion 5 (Perusall and Canvas) • Quiz 5 • Exam 1 (Modules 1 - 4)
6	**Module 6 - British Isles and Europe: British Alien Vertebrates and European Plant Pathogens** • Economic, Environmental and Social Dimensions of Alien Vertebrate Species in Britain • Invasive Plant Pathogens in Europe	• Pimentel Chapter 6, 2nd edition • Pimentel Chapter 9, 2nd edition	• Discussion 6 (Perusall and Canvas) • Quiz 6 • Citrus Greening Discussion on Culture and Impact (Graduate Students only)
7	**Module 7 - British Isles and Europe: European Invertebrates and Vertebrates** • Invasive Patterns of Alien Terrestrial Invertebrates in Europe • Impacts of Alien Vertebrates in Europe	• Pimentel Chapter 8, 2nd edition • Pimentel Chapter 7, 2nd edition	• Discussion 7 (Perusall and Canvas) • Quiz 7
8	**Module 8 - South America, India and Weed Risk Assessment: Brazilian Plant Pathogens and Vertebrates** • Alien Plant Pathogens in Brazil	• Pimentel Chapter 5, 1st edition • Pimentel Chapter 4, 2nd edition	• Discussion 8 (Perusall and Canvas) • Quiz 8 • Citrus Greening Training Module Part 2 (Graduate Students only)
9	**Module 9 - Indian Weed and Plant Pathogens** • Invasive Plants in the Indian Subcontinent • Alien Plant Pathogens in India	• Pimentel Chapter 10, 2nd edition • Pimentel Chapter 9, 1st edition	• Discussion 9 (Perusall and Canvas) • Quiz 9 • Exam 2 (Modules 5 – 8)
10	**Module 10 - South America, India, and Weed Risk Assessment: Indian Invertebrates and IFAS Weed Risk Assessment** • Invasive Invertebrates in India: Economic Implications	• Pimentel Chapter 11, 2nd edition • EDIS #SSAGR-371	• Discussion 10 (Perusall and Canvas) • Quiz 10 • Citrus Greening News Article Activity

	• The IFAS Assessment of Non-Native Plants in Florida's Natural Areas		(Graduate Students only)
11	**Module 11 - Africa, US, and World: South African Weeds and Invertebrates** • Invasive Plants in the Indian Subcontinent • Economic Consequences of the Environmental Impacts of Alien Plant Invasions in South Africa • Impact of Non-native Invertebrates in South Africa	• Pimentel Chapter 14, 2nd edition • Pimentel Chapter 15, 1st edition • Rotherham and Lambert Chapter 22	• Discussion 11 (Perusall and Canvas) • Quiz 11 • Exam 3 (modules 9 - 11) • Weed Risk Assessment
12	**Module 12 - Africa, US, and World: South Africa Vertebrates and US Invasive Species** • Invasive Vertebrates of South Africa • Environmental and Economic Costs Associated with Alien Invasive Species in the United States	• Pimentel Chapter 15, 2nd edition • Pimentel Chapter 17, 2nd edition	• Discussion 12 (Perusall and Canvas) • Quiz 12 • Exam 3 • Citrus Greening Part 3
13	**Module 13 - Africa, US, and World: Invasive US Rodents and Global Diseases** • Rodents and Other Vertebrate Invaders in the United States • Global Threats from Exotic Diseases	• Pimentel Chapter 16, 2nd edition • Pimentel Chapter 18, 1st edition	• Discussion 13 (Perusall and Canvas) • Quiz 13 • Final Comprehensive Exam

COURSE GRADING POLICY

Assignments will be graded, and scores posted within one week of the due date. However, this may change, and in this case, announcements will be made by the instructor or the TA.

	Undergraduate Students		Graduate Students	
Course requirements	**Point value**	**Total points**	**Point value**	**Total points**
Participation	5 each	65	5 each	65
Orientation module assignments	5 each	10	5 each	10
Exams	100 each	400	100 each	400
Quizzes	5 each	55	5 each	55
Discussions in Perusall	10 each	130	10 each	130
Discussions in Canvas	10 each	130	10 each	130
Weed Risk Assessment	50	50	50	50

Citrus Greening Training Module	Not applicable	Not applicable	50		50
Total			**840**		**890**

Grading Scale

Grade	Percentages
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	63 - 66.9
D-	60 - 62.9
E	<59.9 and below

UNIVERSITY OF FLORIDA POLICIES AND ASSISTANCE

Grades and Grade Points - A minimum grade of C is required for Gen Ed credit. For information on current University of Florida policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Attendance and Make-Up Work
Students are expected to attend classes. 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/UGRD/academic-regulations/attendance-policies/

Online Course Evaluation Process
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.bluera.com/ufl/.

University Policy on Academic Conduct
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 honesty 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 Student Honor Code and 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 TA in this class.

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

Plagiarism
The Student Honor Code and Student Conduct Code states that:
"A Student must not represent as the student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:
- Stealing, misquoting, insufficiently paraphrasing, or patch-writing.
- Self-plagiarism, which is the reuse of the student's own submitted work, or the simultaneous submission of the student's own work, without the full and clear acknowledgment and permission of the faculty to whom it is submitted.
- Submitting materials from any source without proper attribution.
- Submitting a document, assignment, or material that, in whole or in part, is identical or substantially identical to a document or assignment the student did not author."

It is to be assumed that all work will be completed independently unless the assignment is defined as a group project, in writing by the professor. This policy will always be vigorously upheld in this course.

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.

University Policy on Accommodating 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/

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

- *Health and Wellness*
    - U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.
    - Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.
    - Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need or visit the Student Health Care Center website.
    - University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).
    - UF Health Shands Emergency Room/Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

- *Academic and Student Support*
    - E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
    - Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
    - Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.
    - Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
    - Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
    - Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.
    - On-Line Students Complaints: View the Distance Learning Student Complaint Process.

Course Evaluations
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 on the GatorEvals Providing Constructive Feedback FAQ page.

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 the GatorEvals website. Summaries of course evaluation results are available to students at the GatorEvals Public Results page.

More information about UF's course evaluation system can be found at the GatorEvals Faculty Evaluations website.