

## **FORS 4210: Forest Health and Protection - 2013 Spring Semester Syllabus**

*The course syllabus is a general plan for the course;  
Deviations announced to the class by the instructors may be necessary.*

### **Lead Instructor**

#### **Dr. Kamal J.K. Gandhi**

Office: 4-331 Forest Resources

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Email: [kjgandhi@uga.edu](mailto:kjgandhi@uga.edu)

If you would like to meet with the instructor outside of class, please make an appointment to do so via email, or in-person after class.

### **Teaching Assistant**

#### **Ms. Jenny Staeben**

Office: 4-425 Forest Resources

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If you would like to meet with the Teaching Assistant outside of laboratory, please make an appointment to do so via email, or in-person after the laboratory.

### **Class Time**

**Lectures:** 12:20 pm – 1:10 pm Mon. & Wed. room 4-517 Forest Resources

**Labs:** 12:20 pm – 2:15 pm Fri. room 4-517 and/or 1-101, as depending on date. The meeting place will be announced in the previous class.

### **Prerequisites**

(BIOL 1104 and BIOL 1104L) or (BIOL 1108-1108L) or (PBIO 1210 and PBIO 1210L) or (PBIO 1220 and PBIO 1220L)

### **Course Description**

This course will cover major disease and insect problems of forests, with an emphasis on their recognition and management. It will also cover wildland fire prevention, suppression and management.

**“The welfare of the human race is closely connected with that of our trees and any work looking to their better protection makes for the advancement of humankind.”**

**– E.P. Felt, State Entomologist for New York, 1905**

### **Course Objectives**

By the end of the semester, students will:

1. Understand basic forest health concepts, such as the characteristics of a healthy forest and the possible causes of forest health problems.
2. Be able to identify the likely cause of a given forest health problem.
3. Know how to manage major forest disease and insect problems.
4. Understand the basics of wildland fire prevention, suppression, and management.

5. Understand the interactions of insects, diseases, and wildland fire.

A variety of strategies will be used to teach the course material. One major goal is to include activities and assignments that give students something to do or think about while learning the course content. In particular, significant portions of class-time will be spent discussing assigned readings and listening to student presentations. Many class periods will be divided into three blocks of time:

First 10-15 minutes: Student “Bug of the Day” presentation.

Next 15-20 minutes: Discussion of assigned reading(s).

Last 15-20 minutes: Dr. Gandhi will lecture on the topic of the next assigned reading.

### **Course Materials on eLearning Commons**

Links to required reading assignments and grades will be posted on eLearning Commons New.

To logon to eLearning Commons point your www browser to: <http://uga.view.usg.edu>. You will need a UGA MyID to sign on. If you do not have a UGA MyID yet, you can go to <http://www.uga.edu/myid> to create one.

**Assignments** – Any changes to these assignments will be announced in class and/or via email.

#### **1. Reading Assignments**

Most class periods will include discussion of an assigned reading. Students will be called on at random in order to participate in these class discussions, and it is expected that they will have completed any study questions or worksheets associated with the reading assignment in advance. The major forest diseases and insect pests will be covered via these reading assignments and the discussions of them in class. The assignments for each class period are listed on the attached schedule and links to each assignment are on the course’s eLearning Commons’ page.

#### **2. Class Participation – 20 points**

Students are expected to attend classes, and attendance will be taken randomly during the semester. At the end of the semester, class participation will be worth 20 points in total.

#### **3. Bug of the Day Presentation – 15 points**

Each student will each give a 10-12 minute, informal presentation on a single disease or insect problem. The format of these talks, plus potential topics and dates are listed on a separate hand-out.

#### **4. Quizzes – 30 points**

There will be a short (~ 5-10 min) quiz about 4 weeks on material covered **in the lectures** since the previous quiz or exam (typically every 4-5 classes). These quizzes will be worth 30 points in total (your final quiz score will equal 30 multiplied by your percentage of correct answers out of the total possible correct answers).

## 5. Lab Assignment – 20 points

There will be one lab assignment on tree damage identification on campus. The details of this assignment will be discussed in upcoming classes.

## 6. Exams – 120 points

There will be three cumulative exams (worth 20, 30 and 40 points each) and one entomology lab exam (worth 30 points). The dates for each exam are listed on the class schedule.

Please note that the graded quizzes and exams will be passed out in the class for students to look at. However, all the graded material will be passed back to the instructor or the TA at the end of the lecture or lab period. If any graded material by a student is not returned at the end of the lecture or lab period, then the student will automatically lose half of their points.

Missed examinations: Make-up exams will be given only if a valid, documented excuse for your absence (i.e. serious illness, death in the family etc.) is provided within 24 hours after an exam is given. You may call and leave a message on Dr. Gandhi's office answering machine (706-542-4614) or with the School's receptionist (706-542-2686), if necessary. *Missed exams without an acceptable, timely excuse will receive a grade of zero.* To acknowledge your understanding of this policy, complete the form on the last page of this syllabus, and return it to Dr. Gandhi as soon as possible. Completion of this assignment is required; you can't take the first exam if this form has not been handed in.

## 7. Additional Assignment for Graduate Credit in FORS 6210 – 20 points

Read, summarize, and analyze two recent forest health research articles. These articles should be published in the primary research literature and should not be review articles. Supply a copy of each article with your summary. See Dr. Gandhi if you would like advice on how to find appropriate scientific articles for this assignment. Each paper will be worth 10 points. Failure to complete this assignment by any graduate student will automatically cause their final course grade to drop by two letter grades. Due dates are on the course schedule.

### Course Grading:

Undergraduate students may earn a total of 205 points. Graduate students may earn a total of 225 points. Letter grades will be assigned as follows at the end of the quarter based on the percentage of total available points earned by each student:

94 – 100 %	= A
90 – 93 %	= A-
87 – 89 %	= B+
83 – 86 %	= B
80 – 82 %	= B-
77 – 79 %	= C+
73 – 76 %	= C
70 – 72 %	= C-
60 – 69 %	= D
≤ 59 %	= F

### **Expectations from Students in the Class-room**

We expect the students in the class-room be respectful to colleagues and instructors at all times. Please refrain from chatting with each other during lecture, as it disruptive to the class-room. If you have questions or are unclear about any concept- ask the instructor. Questions about the class material are highly welcomed. We are also going to request the students to refrain from using electronic devices during the lecture and laboratory periods. If you feel that you absolutely have to use a laptop to take notes, please discuss with the instructor directly.

### **Academic Honesty**

All academic work must meet the standards contained in UGA's academic honesty policy, which is titled "A Culture of Honesty." Each student is responsible for informing themselves about these standards before performing any academic work. Students should not complete all, or part, of another student's assignment unless the project has been specifically designated by the instructor as a group assignment. "A Culture of Honesty" is available at the Vice President for Instruction's website at <http://www.uga.edu/ovpi>, under "Academic Honesty". Any suspected violations of academic honesty will be investigated according to University procedures. Students who are guilty of violating the academic honesty policy will typically receive a grade of "F" and a numerical score of zero on the assignment in question, as well as a course grade of "F".

### FORS 4210/6210 Spring 2013 - Course Schedule

Date	Class Activities/Topics	Reading Assignments
M 1/7	<p>Course Introduction</p> <p>View and discuss film: “Are we killing America’s forests (Dr. Gandhi)</p>	
W 1/9	<p>Forest health concepts</p> <p><u>Reading discussion questions:</u>            What is a healthy forest?            What are the symptoms of an unhealthy forest?</p> <p>Introduction to forest entomology &amp; forest insect feeding groups (Ms. Staeben)</p>	<ol style="list-style-type: none"> <li>1. Pages 1-21, textbook by Edmonds, Agee &amp; Gara (EAG)</li> <li>2. Raffa et al. (2009)</li> </ol>
F 1/11 Lab	<p><b>Lab 1</b> - Introduction to insects (Ms. Staeben)</p>	
M 1/14	<p>Continue with introduction to forest entomology; Review of forest insect types</p> <p><u>Reading discussion questions:</u>            What are some of the main stressors of forest in the south?            How drought indirectly affects phytophagous insects?            (Dr. Gandhi)</p> <p><b>Sign up for Bug of the Day Presentations</b></p>	<ol style="list-style-type: none"> <li>1. Mattson and Haack (1987)</li> </ol>
W 1/16	<p>Insect management strategies discussion</p> <p><u>Reading discussion question:</u>            What strategies can be used to control forest insects?</p> <p>Introduction to defoliators (Dr. Gandhi)</p> <p>Bug of the day presentation:</p>	<p>EAG p. 475-496</p>

	Forest tent caterpillar	
F 1/18 Lab	<b>Lab 2</b> - Insect orders important to forest entomology & types of forest insect damage (Dr. Gandhi)	
<b>M 1/21</b>	<b>Holiday- No Class</b>	
W 1/23	Gypsy moth discussion (Dr. Gandhi)  Bug of the day presentation: Eastern tent caterpillar	Gypsy moth in North America
F 1/25 Lab	<b>Lab 3</b> - Major defoliating insects and their damage (Dr. Gandhi)  Bug of the day presentation: Fall webworm; Red-headed pine sawfly	
M 1/28	<b>Quiz # 1</b>  Intro to bark beetles (Dr. Gandhi)  Southern pine beetle discussion  Bug of the day presentation: Black turpentine beetle	1. Pine Bark Beetles, GFC brochure 2. FIDL: Southern pine beetle 3. Stand Visualization for Southern Pine Beetle Management and Decision Making
W 1/30	Review of bark beetles (Dr. Gandhi)  Mountain pine beetle discussion  Bug of the day presentation: European woodwasp	
F 2/1 Lab	<b>Lab 4</b> - Bark beetles, ambrosia beetles, gallery patterns (Dr. Gandhi)  Bug of the day presentation: Carpenter ants	<b>Grad student paper summary #1 due</b>
M 2/4	Ambrosia beetles, pine sawyer, weevils (Dr. Gandhi)	

	Bug of the day presentation: Southern <i>Ips</i> spp. complex	
W 2/6	<b>Exam #1</b>	
F 2/8 Lab	<b>Lab 5</b> - Sap feeders, shoot insects & regeneration pests (Dr. Gandhi)  <b>Review Session for the Forest Entomology Lab Exam</b>  Bug of the day presentation: Leaf-footed pine seed bug, Lace bugs	
M 2/11	Seed & cone insects (Dr. Hanula)  Bug of the day presentation: Balsam woolly adelgid	
W 2/13	Scale insects, adelgids, aphids, other sap-feeding insects (Dr. Gandhi)  Intro to shoot insects (Dr. Gandhi)  Bug of the day presentation: White pine weevil	1. FIDL: Nantucket pine tip moth 2. Nantucket pine tip moth, UFL Featured Creatures website ( <a href="http://creatures.ifas.ufl.edu/trees/moths/nantucket_pine_tip_moth.htm">http://creatures.ifas.ufl.edu/trees/moths/nantucket_pine_tip_moth.htm</a> )
F 2/15 Lab	<b>Forest Entomology Lab Exam</b>	
M 2/18	Introduced insects: new and/or coming problems (Dr. Gandhi)  Bug of the day presentation: European pine shoot moth	
W 2/20	Hemlock woolly adelgid discussion (Ms. Mech)  Bug of the day presentation: Emerald ash borer	Hemlock Woolly Adelgid Pest Alert
F 2/22 Lab	Introduction to forest diseases & disease diagnosis (Dr. Gandhi)	EAG pp. 199-210

	<p><u>Reading discussion question:</u> How do you diagnose a tree disease?</p> <p>Bug of the day presentation: Gold-spotted oak borer; Red cedar rust</p>	
M 2/25	<p><b>Quiz #2</b></p> <p>Disease management &amp; disease-causing organisms (Dr. Gandhi)</p> <p><u>Reading discussion questions:</u> How do you decide if a disease should be managed? What are common strategies for managing forest diseases?</p> <p>Bug of the day presentation: Armillaria root disease</p>	EAG pp. 417-432
W 2/27	<p>Fusiform rust discussion and life-cycle</p> <p>Bug of the day presentation: Weather damage (hail, wind, lightning), Asian longhorned beetle</p>	Management of Fusiform Rust Disease of Southern Pines
F 3/1 Lab	<p>Sudden Oak Death Dr. Jean Woodward-Williams</p>	National Pest Alert: Sudden Oak Death
M 3/4	<p>Introduction to root diseases (M. Cram)</p> <p>Heterobasidion root disease discussion</p> <p>Root diseases in Yosemite</p>	<p>1. Forest Insect &amp; Disease Leaflet 76: Annosus Root Rot in Eastern Conifers</p> <p>2. Bugwood Fact Sheet - Annosum Root Rot</p>
W 3/6	<p>Introduction to fire.</p> <p>Film: "Season of fire"</p> <p>Bug of the day presentation: Chestnut blight, bacterial gummosis</p>	
F 3/8	<b>Exam #2</b>	
M 3/11	<b>No class – Spring Break</b>	

W 3/13	<b>No class – Spring Break</b>	
F 3/15	<b>No class – Spring Break</b>	
M 3/18	Fire Behavior & Forest Structure- GFC	
W 3/20	Fire Suppression- GFC  Bug of the day presentation: Hemlock borer	
F 3/22 Lab	Wildland Fire Management- GFC  Bug of the day presentation: Slim flux/wetwood	
M 3/25	<b>Quiz #3</b>  Fire Prevention – GFC	
W 3/27	Laurel Wilt - Dr. Stephen Fraedrich, Forest Service  Bug of the day presentation: Pinewood nematode	Pest Alert: Redbay Ambrosia Beetle
F 3/29 Lab	Introduction to vascular wilts (Dr. Gandhi)  Bug of the day presentation: Dogwood anthracnose	
M 4/1	Continue discussion on vascular wilts (Dr. Gandhi)  Bug of the day presentation: White pine blister rust	
W 4/3	Pitch canker discussion (Dr. Gandhi)  Bug of the day presentation: Hypoxylon canker	1. Florida Forest Diseases: Pitch canker 2. Pitch canker resistance. <u>The Tree Barker</u> 3. Pitch canker. <u>Pest Notes</u>
F 4/5 Lab	Littleleaf disease discussion  Introduction to foliage diseases (Dr. Gandhi)  Bug of the day presentation: Laminated root rot; Sycamore anthracnose	1. Littleleaf Disease - Forest Management Sheet, AL Forestry Commission  2. Littleleaf Disease, in Health of Southern Forests

M 4/8	<p>Introduction to Canker diseases of stems (Dr. Gandhi)</p> <p>Bug of the day presentation: Southern cone rust, Beech bark disease</p>	
W 4/10	<p>Dutch elm disease discussion</p> <p>Stem Decays (Dr. Gandhi)</p> <p>Bug of the day presentation: Oak wilt</p>	How to Identify and Manage Dutch Elm Disease
F 4/12 Lab	<p>Brown spot needle blight discussion</p> <p>Introduction to rust diseases of stems &amp; branches (Dr. Gandhi)</p> <p>Bug of the day presentation: Dutch elm disease</p>	<p>Brown spot needle blight (from Bugwood)</p> <p>Brown spot needle blight. Control methods for longleaf pine plantations.</p> <p><b>Graduate Student Summary Due # 2</b></p>
M 4/15	<p><b>Quiz #4</b></p> <p>Continue Stem Decays (Dr. Gandhi)</p> <p>Bug of the day presentation: Butternut canker, Sphaeropsis tip blight</p>	
W 4/17	<p>Forest hazards (Dr. Gandhi)</p> <p>Bug of the Day Presentation: Thousand canker disease</p>	
F 4/19 Lab	<b>Lab- Assess Tree Damage on Campus</b>	
M 4/22	<p>Forest Declines (Dr. Gandhi)</p> <p>Mistletoes</p> <p>Bug of the Day Presentation: Leptographium root disease</p>	<p>1. Causes of yellow cedar decline</p> <p>2. Oak Decline (N. Central Res. Station)</p>
W 4/24	Introduction to Cogongrass	

	Cogongrass film & discussion (Dr. Gandhi)	
F 4/26	What does the Georgia Forestry Commission Forest Health Unit do? Mr. Chip Bates, GFC	<b>Tree Damage Report Due</b>
M 4/29	Review Session for the Final Exam	
Tue 4/30	Reading Day	
<b>May 1-7</b>	<b>FINAL EXAMINATION- Time and Day to be Announced in the Class</b>	