

FOR 4624C -- Forest Health Management

Spring, 2012



Instructor: J.A. Smith, Assistant Professor; 212 Newins-Ziegler Hall; 846-0843  
[jasons@ufl.edu](mailto:jasons@ufl.edu);

Office Hours: non-class hours, M-F 8:00-5:00, by appt.

General Course Procedures:

Class hours and locations: Tuesdays 8:30-10:25 (219NZ) and Thursdays 8:30-11:30 (219NZ).

Occasionally we will meet earlier or go later to facilitate field trips. These class hours will variously be used for lecture and laboratory elements, the specific content of which will vary according to need for field trips, conventional indoor labs, tests, and lectures. Trips requiring appropriate field gear will be announced in advance. The duration of field trips can vary; prior notice of anticipated duration will be provided.

**Attendance in lecture and lab is essential.** You are here to learn; my job is to facilitate that process.

If you have questions, see me at any time.

Class begins on time and will not run over time.

Supplies: You may find a three-ring, looseleaf notebook to be useful in aiding organization of handouts and notes.

A schedule for the topics to be covered will be given at the first day of class. We will not strictly adhere to this schedule, rather, we will use it as a general list of topics to be covered and may spend more time on certain topics than others.

Texts: There is no teaching text available to support this course. However, the following books will serve as reference texts in support of some portions of the lecture materials. While these books are not teaching texts, and are not required for the course, they are excellent professional references and as such they should be

viewed as an investment in your personal library as well as items in support of this particular course.

Sinclair, Lyon, and Johnson. 2005. Diseases of Trees and Shrubs. 2nd Ed., Cornell University Press.

Johnson and Lyon. 1988. Insects that Feed on Trees and Shrubs. 2nd Ed., Cornell University Press.

Reading assignments will be given from materials distributed in class and posted on the Sakai website for the class. Please become familiar with the Sakai website as we will use it often to post assignments, readings, lecture notes and class announcements.

#### Evaluation of Learning/Performance:

Grading: A= 90-100, B = 80-89, C = 70-79, D = 60-69, E = < 60

Tests: Four tests will be given, spaced at approximately equal intervals during the semester. Each test will be about one hour in length. The tests will include factual, conceptual, and problem solving components. Laboratory material will be included in each test. Tests 2 thru 4 will be cumulative, with 'old material' comprising ca. 10-15% of the test content. Each test will comprise 20% of the course grade.

#### 'Assigned' Alien White Paper and Report:

To be assigned and detailed approximately mid-way through the term. The paper and presentation will comprise 10% of the course grade.

Sick tree scavenger hunt and diagnosis: This assignment will involve searching for, photographing and providing a diagnosis for sick trees on campus and will account for 5% of the class grade.

#### Participation:

Participation will comprise 5% of the course grade. Participation points are earned according to attention and constructive, positive involvement in the course.

#### Course Administration:

Please plan to arrive at class on time ..... late arrivals are disruptive to the class and inconsiderate of those who have made the effort to be on time.

'Make-ups' will not be given; exceptions are very rare.

#### Important Dates:

2 February: Test 1 (followed by class)

1 March: Test 2 (followed by class)

29 March: Test 3 (followed by class)

5 April: Alien presentations

TBA: Test 4 (Final Exam)

Class will not be held on 21 Feb because of SESAF and on 6 & 8 March because of UF Spring Break.

Helpful Hints:

This course will start off very slowly, don't be lulled into a false sense of academic security. Study as we go. As soon as possible after each class, thoughtfully review the material we have just covered and list any points that need clarification. Seek to answer the questions yourself, it will reinforce the learning process. If you still have questions, please see me as soon as possible, while the material is still fresh. This relatively minor investment each week will increase long-term retention, reduce the time needed to specifically prepare for tests, and will improve your testing performance.

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

In 1995 the UF student body enacted and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor 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. On all work submitted for credit by students at the university, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior. Students should report any

condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court. (Source: 2010-2011 Undergraduate Catalog)

It is assumed all work will be completed independently unless the assignment is deemed as a group project, in writing by the instructor. This policy will be vigorously upheld at all times 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. Campus Helping Resources Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

University Counseling & Wellness Center: 3190 Radio Road, 352-392-1575, provides: Counseling Services, Groups and Workshops, Outreach and Consultation, Self-Help Library, Training Programs, Community Provider Database

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.

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## FOREST HEALTH MANAGEMENT

- a general course outline -

An integrated, tree and forest-oriented study of forest health emphasizing the ecological and economic roles of the biotic agents and abiotic factors that incite dysfunction and the biological and ecological bases for the maintenance of forest health through integrated management of these agents and the forest.

### **I. Introduction to Forest Health Management**

The nature of tree and forest health; what is a healthy tree, a healthy forest

The nature and importance of damaging agents/factors and their management

The relationship of tree/forest health to forest values and functions

An ecosystem perspective on forest health:

change and disturbance, natural and managed systems, unaltered and altered systems, forest health vs. human health

Damage and loss in the context of management objectives

### **II. The Physiological Processes Supporting Tree Growth and Development. Requirements for Growth and Development of Healthy Trees and Forests.** (Cryptic refreshers to set the background for subsequent study)

### **III. Disturbance of Normal Functions**

#### **The Causative Agents and Factors**

Biotic agents (Elements of the living environment)

Microbes (fungi, bacteria, viruses, mycoplasmas, algae, nematodes)

Flowering plants (mistletoes; allelopathic and competitive/displacing plants)

Arthropods (insects and mites)

Vertebrates (birds, mammals including man, etc)

Abiotic factors (Elements of the physical/chemical environment)

Anthropogenic factors (pollutants, mechanical, cultural, etc)

Naturally-occurring factors (moisture, temperature, nutrient extremes & imbalances, lightning, fire, wind, etc)

## **The Categories of Disorders**

Injury - induced by biotic agents and abiotic factors

Disease - pathogenic and physiogenic diseases

Decline disorders - stress and predisposition

## **Impairments of Normal Processes and Functions (concepts/overview)**

Photosynthate production: (dysfunctions of foliage)

Procurement of water and nutrients: (dysfunctions of the root system)

Transport and translocation of water/nutrients and photosynthate: (dysfunctions of xylem and phloem)

Regulation of growth and development: (dysfunctions of general metabolic pathways)

Photosynthate storage and structural integrity: (dysfunctions of xylem)

Reproduction: (dysfunctions of reproductive structures)

Ecological processes: cycles and pathways

## **IV. Biology, Epidemiology and Population Dynamics**

Ecological Relationships

Generalized biology, behavior, and life cycles of biotic pests

Environment: the permitting/restricting mediator

The Plant Health Triangle: an approach for understanding the occurrence and severity of plant health problems

Dynamics of pest populations: biotic potential & environmental resistance

Defense: individual and population level mechanisms

## **V. Tree and Forest Health Management -An overview**

Approaches: Prevention and Therapy/Suppression

Principles: Exclusion/Containment, Eradication/Reduction, Protection, Avoidance, Resistance

Tactics: Regulatory, Cultural, Biological, Chemical, Physical/Mechanical, Genetic

Monitoring, Hazard-Risk Evaluation, and Impact Assessment: Techniques, measurements, time aspect, value spectrum, cost-benefit

Strategy Development for Integrated Forest Health Management:  
Concept, definition, approaches, relation to Integrated Pest Management

## **VI. Specific Dysfunctions**

This section integrates general concepts of forest health into discussions of specific forest problems that are selected in accordance with economic or ecological importance, or as representatives of important agent groups, critical concepts, pest dynamics, and management strategies.

Foliage- photosynthetic capacity impaired

Buds and Shoots - elongation/ height growth capacity impaired

Stem and Branches

- vascular function, storage, structure and radial growth impaired

Roots - impaired vascular function, storage, structure, absorption, growth

Reproductive elements - reproductive capacity impaired

Declines - complexes of interacting agents affecting many functions

Wood Products in service - damage to wood products by biotic agents

## **VII. Forest Managers and the Management of Forest Health**

Silvicultural systems and forest health problems

Integrating forest health management into forest management