

Forest Health Issues - BSPM 521 --3 credits

Fall

Class Meets Twice a Week for at 1:00 pm to 2:15 pm in Room E- 05 Plant Sciences

Instructor: Dr. W.R. Jacobi & Guest Speakers

C-202 Plant Sci., 491-6927, William.jacobi@colostate.edu

Class objectives: Students will:

1. Conduct in-depth study and discussion of current topics related to forest and shade tree health.
2. Learn skills in active learning, information gathering, assessing published research results, and speaking and writing.
3. Develop an understanding of the relationships of disturbances from insects, diseases and abiotic factors in forest and urban ecosystems.

Course Grading:

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|---|------------|
| 1. Oral and written summary on a current forest health related issue: | |
| • Written abstract/summary | 50 |
| • oral introduction to topic | 50 |
| • Leading discussion | 50 |
| 2. Class discussion participation and notes (20 discussions @ 5) | 100 |
| 3. Discussion lead | 40 |
| 4. Discussion co lead | 20 |
| 5. Exams 2 @ 100 | <u>200</u> |
| 6. Total Points: | 510 |

Each class member must ask at least one question or provide commentary on the topic of the day per class period to receive credit for that class period.

Grades will be A (90-100), B (80-89), C (70-79), D (60-69), F. Should do plus and minus next time.

Field Trips:

1. You are all invited to go on a field trip to observe insect and disease impacts. This trip is organized for the Integrated Tree Health Management Class BSPM 365.
2. Permission forms needed for field trips.

Course format: Lecture and Discussion: About 25-50% of the lecture time will be typical lectures with several invited guest lectures with the other 50-75% of the time spent discussing a topic based on reading one or more research papers.

I will follow the University's policies on plagiarism and cheating. Please refer to the University policies.

Class Schedule, BSPM 521, Forest Health Issues- Fall

<u>Date</u>	<u>Topic</u>
Aug 23	Introduction and Forest health historic perspectives (Jacobi lecture)
Aug 25	What does the past tell us about the future (Hartig 1874 and APS symposium papers)
Aug 30	Ecosystem Management and Insect and Diseases (Monnig/ Byler) ()
Sept 1	Tissue level defense systems in trees (Jacobi lecture)
Sept 6	No Class, University Holiday
Sept 8	Tissue level defense systems in trees (Eyles et al) ()
Sept 13	Chestnut blight as a model disease and genetic story (Robin et al 2010) ()
Sept 15	Declines in North America (Yellow Cedar Decline-DAmore eta 2010) ()
Sept 20	Pinewood nematode biology, impact around the world (Ned Tisserat)
Sept 22	Fire relationships and forest insect and diseases (Parker et al and skim Gara et al) ()
Sept 27	Finish up Fire relationships and forest insects and diseases? () Acidic deposition - Historic (Schutt/Cowling, 1985, Skelly/Innes, 1994) ()
Sept 29	Acidic deposition – Current status (Menz 2004, St Clair 2008)) Student led discussion ()
Oct 4	No class – spend time developing your discussion topic
Oct 6	Exam
Oct 11	Student led discussions ()
Oct 13	Student led discussions ()
Oct 18	Climate change and insect and diseases (Desprez 2007) ()
Oct 20	Student led discussions (Tara and Javier)
Oct 25	MPB, management and nutrient relationships (Chuck Rhoads, Rocky Mt Station)
Oct 27	Student led discussion ()
Nov 1	Aspen- Sudden aspen decline in Colorado (Worrall et al 2008) ()
Nov 3	Predicting behavior of forest diseases as climate changes Webinar at 1:15.
Nov 8	Firewood and exotic pest transport (Jacobi gives research report) need paper
Nov 10	Preventing exotic introductions (Lisa Peraino, USDA APHIS)
Nov 15	Economics and ecological impacts of exotics (Lovett et al 2006) ()
Nov 17	SOD, EAB, pinewood nematode lessons learned (Garbelotto et al 2007) ()
Nov 22	No class
Nov 24	No class
Nov 29	Fire, diseases, insects and carbon dioxide production- (Mike Ryan, Rocky Mt Research Station) (Lead Michael, co Javier)
Dec 1	Student led discussion ()
Dec 6	Beetles, tree physiology and water (Rob Hubbard, Rocky Mt Research Station) ()
Dec 8	Student led discussion ()
Dec 15	Final exam: Wednesday, 9:10-11:10 am in room E-005 Plant Science

Literature Reading in BSPM 521

Be prepared to discuss the literature assigned for the class. How to do this?

1. Determine and write down the theme or reason for the paper.
2. What are the big points made in the paper and how can the findings be used in the real world?
3. What was missing from research or article or conclusions or methods so you could understand it?
4. What are the next research or action steps needed based on what the paper provided?
5. Have at least two questions related to the article written down.
6. Does the article have a bias? Why?
7. Does it sound like there are other interpretations possible?
8. You will turn in summaries of the article and discussion summary by Thursday night each week for both classes that week

Possible Student Discussion Topics: Please pick a topic that you always wanted an answer for or look at some of the suggestions. Please talk to me about it so we can make sure you can find enough information. If the topic is already on the class schedule please talk to me and we can find an topic that does not overlap.

1. Ecological and economic impact of Gypsy moth east of the Mississippi. Or any exotic that has been here for 100 years or so.
2. How do trees defend against various agents? Pick an type of insect or pathogen.
3. How do vascular wilt organisms kill trees?
4. Why do insect populations such as bark beetles increase dramatically.
5. The relationships of bark beetles and their fungal symbionts. What do the "stain" fungi actually do???
6. Mycorrhizae: New findings and practical applications to tree health in the urban environment.
7. Is biocontrol of forest disease pathogens or insects worth anything? What is the status?
8. Is there realistic potential for genetic resistance in trees via genetic manipulation?
9. Genetics of trees on a spatial scale in forests. Do they affect patterns of disturbance?
10. Should we be planting clones of forest trees? New Zealand is going for this.
11. How does drought stress effect tree defenses?
12. Invasive weeds in forest ecosystems. Is biological diversity at risk?
13. White pine blister rust is moving into the state. What is its ecological impact in the Rocky Mts on limber, white bark and bristle cone pines?
14. Declines: Oak, birch, ash etc
15. Sudden Oak Death in California: Impacts on the rest of North America.
16. How can we manage to prevent invasive insect and pathogens of trees from moving around the world?
17. How does government polices affect forest health and sustainability?
18. Can we sustain ecosystems without management in light of insect and disease stress
19. How do insects, pathogens and fire interact in western forests? Pick some small question found in a paper
20. How is carbon fixing in forests affected by insects and diseases and wild fires.
21. What has the environmental movement done for carbon fixing in western forests? Positive or negative?
22. How does CO₂ production differ between unmanaged lodgepole, lodgepole killed by beetles, killed by fire, and managed lodgepole?

Paper Information: You will work as independent students but please interact and help each other with these projects.

- Your summary report on the topic should be no more than three pages, double spaced at 12 pt font.
- The audience for your report is your fellow students so be concise but explain all concepts.
- Figures can be attached but the entire packet cannot be any longer than three pages.
- Please give a minimum of 4 citations for papers that are great starting places to learn about this topic. Also they should contain the new information. One paper for reading and discussing should be selected to provide to the class one week prior via ram ct. Please send to Bill Jacobi as a pdf.
- Please use reader friendly writing with visual aids such as subheadings, tables, and figures. The format would be of a report, with title page with authors, affiliation, and date.
- We need to have one reference paper to read at least one week before your presentation as PDF and I will load it on the web site.
- Please use power point to introduce your topic only. Max 8 min presentation plus lead a discussion of your topic and paper for 30 min.