FOREST ECOLOGY AND MANAGEMENT – FALL 2017
SCHOOL OF NATURAL RESOURCES AND THE ENVIRONMENT
UNIVERSITY OF MICHIGAN

COURSE No.: NRE 547 FOREST ECOLOGY AND MANAGEMENT

INSTRUCTOR: Inés Ibáñez
Dana 2546
iibanez@umich.edu

OFFICE HOURS: Tuesdays 12-2 pm (Dana 2546)

GSI: Ben Lee
benrlee@umich.edu

MEETING TIMES: Lectures Tuesday & Thursday 11:00 am – 12 pm, Dana 1024
Labs Thursdays 12-4 pm, Saginaw forest & Dana 3038

COURSE DESCRIPTION:

In this course, we will use ecological concepts as they apply to forests in the context of current forest ecological research and forest management. We will study the biological and ecological basis behind the current challenges forest ecosystems face under global change (i.e., climate change, landscape fragmentation, pollution, introduced species). We will also review the role and impact of humans on these communities, focusing on the services forests ecosystems provide and the emergence of urban ecology.

Part of the course will involve developing forest research and management plans, in which we will apply the concepts reviewed in both lecture and lab to real world problems. Students will have the choice to work on their plans as either a research project or a management project. Each student will present a management/research plan during the presentation sessions scheduled at the end of the semester.

Labs will consist of field trips to Saginaw forest during the first half of semester and computer labs during the second half. Data collected in the field will be processed in the lab and analyzed during the computer labs. Field labs will focus on learning various sampling design and data collection techniques. Computer labs will focus on the implementation of basic statistical analysis and models in R to the analysis of field data. The lab exercises will involve assessment of forest biodiversity, estimation of tree species biomass and demographic parameters, and measurement of forest carbon pools.

COURSE OBJECTIVES:

By the end of course, students will have an understanding of the concepts, components, mechanisms and processes that shape forests, and will be able to apply this knowledge to a variety of contexts (e.g., management, recreation, conservation, research). In addition, students will have gained skills in reading comprehension, synthesis, scientific presentation, field techniques, and basic modeling skills.
**PREREQUISITES:**

Students taking this course are expected to have a background in general ecology and have mastered the basic principles in ecology.

**CLASS SCHEDULE**

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<thead>
<tr>
<th>Day</th>
<th>Topic</th>
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<tbody>
<tr>
<td>September 5</td>
<td>Course introduction</td>
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<tr>
<td></td>
<td>Forests ecosystems (Boreal, Northern temperature, Tropical and Managed forest) I</td>
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<tr>
<td>September 7</td>
<td>Forests ecosystems (Boreal, Northern temperature, Tropical and Managed forest) II</td>
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<td>September 12</td>
<td>Forests ecosystems (Boreal, Northern temperature, Tropical and Managed forest) III</td>
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<td>September 14</td>
<td>Sampling design</td>
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<td>September 19</td>
<td>Evaluating forest conditions</td>
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<td>September 21</td>
<td>Forest Soils I</td>
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<td>September 26</td>
<td>Forest Soils II</td>
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<td>September 28</td>
<td>Energy and nutrients-biogeochemical cycling</td>
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<td>October 3</td>
<td>Energy and nutrients-primary production and allocation</td>
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<td>October 5</td>
<td>Forest disturbances: Insects, Wind and Fire I</td>
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<tr>
<td>October 10</td>
<td>Disturbances: Insects, Wind and Fire II</td>
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<td>October 12</td>
<td>Midterm exam</td>
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<td>October 17</td>
<td>FALL BREAK</td>
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<td>October 19</td>
<td>Succession and gap dynamics</td>
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<td>Using natural disturbance dynamics in management</td>
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October 24 | MANAGEMENT  
| Forest biodiversity, an ecological indicator  
October 26 | Preserving ecosystem integrity and Sustainable management  
October 31 | Natural regeneration after harvesting and Forest Degradation  
November 2 | REDD+ and Forest Restoration  
November 7 | Wildlife management in forest ecosystems  
November 9 | GLOBAL CHANGE  
| Climate change I  
November 14 | Climate change II  
November 16 | Fragmentation  
November 21 | Pollution  
| Management/Research plan 2 due 11:00 am  
November 23 | THANKSGIVING  
November 28 | Invasive species  
November 30 | Urban Forests  
December 5 | Guest lecture: Bill Banzhaf former president of the Sustainable Forestry Initiative, former executive vice-president of the Society of American Foresters  
December 7 | FOREST MODELS  
| Forest Models  
December 12 | Presentations  
December 14 | Final Management/Research plan due 6:00 pm  

**LAB SCHEDULE**

*Saginaw Forest: [http://www.snre.umich.edu/facilities/saginaw_forest](http://www.snre.umich.edu/facilities/saginaw_forest)*

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<tr>
<td>September 7</td>
<td>LAB: No lab this week</td>
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<td>Date</td>
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<td>September 14</td>
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<td>LAB 10</td>
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<td>December 7</td>
<td>LAB 11</td>
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**GRADING**

Grading will be based on class participation, three management/research reports distributed along the semester, an oral presentation on the case studies, lab reports, and a midterm exam:

- class participation 10%
- oral presentation 10%
- midterm exam 15%
- lab reports 20%
- management/research plan 1 10%
- management/research plan 2 15%
- final management/research plan 3 20%

- Class participation: students’ questions and comments are encouraged during the lectures and after the oral presentations. Class participation includes attendance and knowledge of the assigned lecture readings and the submission of presentations feedback.
- The management/research plan will reflect real-world situations and students will have to use the theoretical and applied concepts reviewed during the lectures and labs to develop a research project or a management plan. A week before each due date we will review the guidelines for writing management/research plans. **Management/research plans will be due on: October 10, November 22, December 14.**

- Students are expected to give an individual oral presentation, ~5-10 minutes, on their management/research plans. After each session of presentation we will have a round-table discussion on the topics. A week before the start of the presentations we will review the guidelines for presenting management/research plans.

- Lab materials will be posted the Friday before the lab period. Lab reports will due a week from the end of the lab.

- The final exam will consist of the submission of the final management/research plan, and will be due at the assigned day and time. **December 14 6:00 pm.**

**Honor Code**

All students are expected to abide to the University of Michigan SNRE Honor Code. Plagiarism will result in direct failure of the course. Plagiarism includes: 1) the direct use of any written material (e.g., books, journals, internet) without proper quotations and citation or 2) the submission of a document, in part or wholly authored by someone other than the student.

**Reference Material**


LINKS TO GUIDES ON FOREST MANAGEMENT PLANS

Michigan: http://www.michigan.gov/dnr/0,4570,7-153-30301_30505_62551---,00.html
Private owners: http://www.forestasyst.org/managementplan.html
Florida: http://sfrc.ufl.edu/extension/florida_forestry_information/forest_management/plan.html
Oregon: http://outreach.oregonstate.edu/programs/forestry/oregon-forest-management-planning
Urban: http://treepittsburgh.org/urban-forest-master-plan