FES 521: *Natural Resources Research Planning*  
Course Syllabus: Winter 2014

**Instructor:** Glenn Howe; 334 Richardson Hall; 737-9001; Glenn.Howe@oregonstate.edu

**Number of credits:** 3

**Prerequisites:** None

**Web address:** [http://www.cof.orst.edu/cof/teach/fs521/](http://www.cof.orst.edu/cof/teach/fs521/). You are **required** to read, understand, and complete all of the assignments and responsibilities described on the class web site. Contact Glenn Howe if you have questions about the web site.

**Structure:** The course will meet twice a week. In-class activities will consist of lectures, classroom discussions of assigned papers, and small group activities.

**Schedule:** Tuesdays and Thursdays 9:00-9:50 p.m. from January 7 to March 13.

**Location:** Peavy 104

**Course overview:** This course provides graduate students with the fundamental research skills needed to successfully complete their graduate degree program and begin their professional career. In this course, you will learn how to plan, write, and critique scientific research proposals. Instruction will focus on direct, hands-on learning by writing a research proposal that could serve as your graduate thesis proposal. You will learn to pose relevant, interesting, and tractable researchable questions; design testable hypotheses; develop research goals and objectives; and apply critical thinking skills to design appropriate research methods. Students will benefit from having taken FES 520, although this is not a prerequisite.

**Time management:** This course combines as much as **100 hours** of classroom instruction and outside assignments for **3 credits**. Because the workload is not equally spaced throughout the term, it’s good to plan ahead. See the following OSU web site for good tips about time management. ([http://oregonstate.edu/counsel/time-management](http://oregonstate.edu/counsel/time-management)).

**Grading:** **A/F** (A through F), based on scores obtained by completing the assignments ([http://www.cof.orst.edu/cof/teach/fs521/grading.htm](http://www.cof.orst.edu/cof/teach/fs521/grading.htm)). For information on deductions for tardy work, please refer to the **late assignment policy** ([http://www.cof.orst.edu/cof/teach/fs521/Late_policy.htm](http://www.cof.orst.edu/cof/teach/fs521/Late_policy.htm)).

**Course outcomes:** Students will be able to:

- Describe the key elements of the scientific method and a good researchable question.
- Describe the key elements of a scientifically rigorous research proposal.
- Recognize high-quality research proposals and provide constructive feedback on the research proposals of colleagues.
- Plan and write coherent and scientifically rigorous research proposals.
- Describe the process of publication submission and peer review.
- Describe the process of proposal submission and peer review.
- Critically evaluate experimental designs and other research methods.
- Discuss scientific ethics and their role in the scientific process.

**Assignments:** Each student will:

- Write a research proposal.
- Read and discuss research proposals and other assigned readings.
- Grade the class participation of classmates.
- Critique the research proposals of classmates.
COURSE OBJECTIVES

Understand the scientific process. Students will understand the relationships between the research problem, research question, underlying theory, hypotheses, research objectives, data collection, hypothesis testing, evaluation of the underlying theory, and the formulation of new hypotheses or theories.

Understand the research planning process. Students will understand the elements of research planning and the practical limitations that must be considered in addressing researchable questions. This includes an understanding of how the student’s research question relates to a larger research problem.

Understand the components of a research proposal. Students will understand the components of a research proposal, including the abstract, background, hypotheses, goals and objectives, rationale and significance, methods and materials, references, and budget.

Use critical thinking to develop and review research proposals. Students will understand how to provide constructive, critical evaluations of research proposals. Students will understand how to critically evaluate published accounts of study designs. Students will participate in small group discussions and critique the research proposals of their peers.

Understand how to communicate research concepts and methods. Students will understand how to discuss proposals, ask questions, and provide constructive criticism. Their written and oral communication skills will be improved through writing assignments, lectures, peer feedback, and oral presentations.

Understand the importance of objectivity and scientific ethics. Students will understand how objectivity and truth are the cornerstones of science. Equally important, they will learn about intentional and unintentional scientific fraud and ways to avoid unintentional fraud.

Understand the publication process. Students will understand the importance of publishing, how the publication process works, and how to respond to peer reviews.

COURSE LEARNING ACTIVITIES

Research proposal and other written assignments. A written proposal describing your research project is required at the end the term. This proposal is the culmination of earlier written assignments that focus on the individual elements of the research proposal. Although this course provides structure, broad guidelines, and context for your research proposal, it is not a substitute for the frequent dialogue between you and your major professor that is crucial for developing a successful thesis proposal.

Peer reviews. Students will critique materials prepared by other students. This will provide you with valuable feedback and help you develop your ability to review scientific publications and proposals.

Class presentations. Presentations given by the instructor are described in the course schedule. These presentations will be reinforced by outside readings, course assignments, small group exercises, and classroom discussions.

Discussions. Each class meeting will include some time for classroom discussion, and some meetings will consist almost entirely of discussion-oriented activities. Students are encouraged to ask questions, make suggestions, and discuss relevant issues.

Readings. A list of required readings is found at the Course schedule web page (http://www.cof.orst.edu/cof/teach/fs521/schedule.htm). A list of required and optional readings is available at the Readings web page (http://www.cof.orst.edu/cof/teach/fs521/readings.htm). You will need to use a case-sensitive user name (FS521) and password (proposal) to access the readings.
COURSE SCHEDULE: *Natural Resources Research Planning*

Check the FES521 web site frequently for updates to the topics, readings due, and assignments due. [http://www.cof.orst.edu/cof/teach/fs521/index.htm](http://www.cof.orst.edu/cof/teach/fs521/index.htm).

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<thead>
<tr>
<th>Date</th>
<th>Topics</th>
<th>Readings due</th>
<th>Assignments due</th>
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<tbody>
<tr>
<td>Jan 7</td>
<td>Course introduction - Syllabus  Researchable questions</td>
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<tr>
<td>Jan 9</td>
<td>Elements of a proposal</td>
<td>The research proposal</td>
<td>Course familiarization  Class participation overview  Plagiarism</td>
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<td>Jan 16</td>
<td>Research planning</td>
<td>Ford, Chapter 4, pp 73-90, 101-102</td>
<td>Outlines</td>
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<td>Jan 21</td>
<td>Scientific method and reasoning</td>
<td>Platt (1964)</td>
<td>Researchable question and hypotheses</td>
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<td>Jan 23</td>
<td>Small group discussions  <em>Researchable question and hypotheses</em></td>
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<td>Critique: Researchable question and hypotheses</td>
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<td>Jan 30</td>
<td>Proposal Introduction  <em>Background</em>  <em>Hypotheses</em>  <em>Goals and objectives</em>  <em>Rationale and significance</em></td>
<td>The research proposal (refresher)</td>
<td>Introduction  References  Proposal format approval</td>
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<td>Feb 4</td>
<td>Methods section  <em>Intro to critical thinking</em>  <em>Scope of inference</em>  <em>Expected results</em></td>
<td>The research proposal (refresher)</td>
<td>Outline: Introduction</td>
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<td>Feb 6</td>
<td>Small group discussions  <em>Introduction</em></td>
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<td>Critique: Introduction outline  Participation grades #1</td>
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<td>Feb 11</td>
<td>Design &amp; analysis of research studies  Statistical inferences</td>
<td>Manly, Chapter 1</td>
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<td>Feb 13</td>
<td>Methods and expected results  problem-solving session</td>
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<td>Draft introduction</td>
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### Feb 18
- Writing
  - Clarity, grammar and style
  - Outlines
  - Plagiarism
  - References
- Clarity in writing
- UW style points
- Outline: Methods and expected results

### Feb 20
- Small group discussions
  - Methods and expected results
- Critique: Methods and expected results outline

### Feb 25
- Scientific ethics and research integrity
- On being a Scientist
- Research integrity

### Feb 27
- Student proposal review
- Meigs proposal
- Draft: Methods and expected results

### Mar 4
- Publishing your research
- The peer review process
- Reading to be assigned
- (check the web site)
- CJFR author instructions

### Mar 6
- Proposal reviews
  - Individual reviews
  - Panel reviews
- NRI reviews
- NSF reviews
- Final proposal

### Mar 11
- Panels meet to discuss proposals
- Final proposal reviews

### Mar 13
- Course evaluation and wrap-up
- Panel review summary
- Participation grades #2

### STUDENTS WITH DISABILITIES
"Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098."

### EXPECTATIONS FOR STUDENT CONDUCT
This course will adhere to all university and college policies regarding Professional Conduct. More information can be found at the following web addresses:

**College of Forestry Code of Professional Conduct**
http://www.cof.orst.edu/cof/teach/honorsys.php

**Student Conduct Code Offenses**
http://oregonstate.edu/studentconduct/student-conduct-code-offenses

**Academic Dishonesty**
http://oregonstate.edu/studentconduct/http%3A%252F%2Foregonstate.edu/studentconduct/faculty/facacdis.php