**NRC 601 -- RESEARCH CONCEPTS IN NATURAL RESOURCES CONSERVATION**

(#34941, 3 credits)

http://people.umass.edu/sdestef

Fall Semester 2009
Syllabus and Course Description

**INSTRUCTOR:** Dr. Stephen DeStefano, 329 Holdsworth Natural Resources Center
e-mail: sdestef@nrc.umass.edu
office phone: 545-4889
office hours: Mon., Wed. 10:00-11:00

**TEACHING ASSISTANT:** Jennifer Strules
e-mail: jestrule@nrc.umass.edu

**CLASS MEETINGS:** Lecture/Discussion Mondays & Wednesdays 8:45-9:55 HOLDSWORTH 308

**CONCURRENT COURSE:** Taken in conjunction with NRC 697L - Communicating Science with Dr. Kevin McGarigal, Fridays 8:45-9:55 HOLDSWORTH 308

**TEXT AND READINGS:** Papers in major scientific journals and other readings.

Optional references:


**COURSE DESCRIPTION AND OBJECTIVES:**

Introduction to the research process in the natural resources sciences. Course will focus on research philosophy, concepts, and design, but will progress through the entire research cycle, from development of hypotheses, questions, and proposals, to grants and budgeting, to delivery of research products. Goals are:

1. To provide a foundation of basic concepts and approaches for designing research that can be applied universally in the natural resources sciences, including ecology, fisheries and wildlife biology, forestry, human dimensions, and watershed management.

2. To investigate the entire research cycle, from development of hypotheses and proposals, to designing and implementing research, to reporting results.

3. To discuss current and ongoing issues integral to conducting research, such as hypothesis testing, funding, logistics, and advocacy.

4. To become familiar with some major scientific literature on research approaches, concepts, and design.

5. To prepare a working written draft of your graduate research proposal and to present your proposed research (in conjunction with Communicating Science) to the department for discussion and critique.
COURSE GRADING:
Midterm exam (25%), draft proposal (25%), proposal presentation (25%), participation and miscellaneous assignments (25%).

ACADEMIC HONESTY:
The University requires honesty of all its members in their academic work. Honesty is necessary to the learning process, and is integral to the atmosphere of genuine inquiry and intellectual curiosity that the University seeks to foster. Academic dishonesty not only contradicts the expectations of a community whose central purpose is the pursuit of intellectual endeavor, it violates University rules and regulations, a fact of which all students must be aware. See the web site http://www.umass.edu/umhome/policies/honesty.html for further information.

SPECIAL NEEDS:
Please contact me if you have special needs or requirements in order for you to take and participate in this course. The web site http://www.umass.edu/thepoint/support/disabilities/ has additional information.

GRADUATE STUDENT GUIDELINES:
http://www.umass.edu/gradschool/handbook/
http://nrc.umass.edu/wp-content/uploads/2008/02/wfconguide05.pdf

READING LIST:


<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings/References/Notes</th>
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</thead>
<tbody>
<tr>
<td>1. Sep. 9 (W)</td>
<td>Introductions and orientation</td>
<td>DNRC Web Site at <a href="http://nrc.umass.edu/">http://nrc.umass.edu/</a></td>
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<tr>
<td></td>
<td>Course structure, objectives, and schedule</td>
<td>UMass Graduate School Handbook at <a href="http://www.umass.edu/gradschool/handbook/">http://www.umass.edu/gradschool/handbook/</a></td>
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<tr>
<td>2. Sep. 14 (M)</td>
<td>History of science and scientific thought</td>
<td>(Note: class begins at 8:45 for remainder of semester, Mondays and Wednesdays)</td>
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<td>3. Sep. 16 (W)</td>
<td>Proposal writing I - Overview: why write a proposal?; basic structure; logistics; examples</td>
<td>Proposal example</td>
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<td>4. Sep. 21 (M)</td>
<td>Philosophers of science</td>
<td>Mayr 1997 Chapters 1&amp; 2</td>
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<td>(Note: 21 Sept. is last day to ADD/DROP)</td>
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<td>5. Sep. 23 (W)</td>
<td>Proposal writing II - The Literature</td>
<td>BRIEF STATEMENT OF PROPOSED RESEARCH or PROFESSIONAL PAPER</td>
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<td>7. Sep. 30 (W)</td>
<td>Proposal writing III - Titles, abstracts, introductions, objectives</td>
<td>LITERATURE: 5 IMPORTANT CITATIONS</td>
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<td>9. Oct. 7 (W)</td>
<td>Proposal writing IV - Conceptual models; methods</td>
<td>PROPOSAL: TITLE &amp; INTRODUCTION (including objectives &amp; questions)</td>
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<td>NO CLASS</td>
<td>Holiday: Columbus Day</td>
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<tr>
<td>Date</td>
<td>Activity Description</td>
<td>References/Notes</td>
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<td>Oct. 19 (M)</td>
<td>Asking why and more on improving research in natural resources sciences</td>
<td>Gavin 1991, Hunter 1989, Anderson 2001 (Note: 19 Oct. last day to drop with “DR”)</td>
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<td>Oct. 21 (W)</td>
<td>Proposal writing VI – Schedules &amp; budgets</td>
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<td>Oct. 26 (M)</td>
<td>Replication and pseudoreplication</td>
<td>Hulbert 1984, Oksanen 2001</td>
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<td>Oct. 28 (W)</td>
<td>Proposal writing VII - Applying for grants</td>
<td>PROPOSAL: ANTICIPATED RESULTS &amp; SCHEDULE</td>
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<td>Nov. 2 (M)</td>
<td>Designed experiments</td>
<td>Optional reading: Connell 1961a, 1961b; Paine 1963, 1966, 1971 (Note: 27 Oct. is the midterm date)</td>
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<td>Nov. 4 (W)</td>
<td>The null hypothesis issue</td>
<td>TBA</td>
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<td>Nov. 9 (M)</td>
<td>EXAM</td>
<td>Material up to and including Nov. 4</td>
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<td>Nov. 11 (W)</td>
<td>NO CLASS</td>
<td>Holiday: Veteran’s Day</td>
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<td>Nov. 16 (M)</td>
<td>Proposal catch-up and completion day</td>
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<td>Nov. 18 (W)</td>
<td>Objectivity, advocacy, and normative science</td>
<td>DeStefano and Steidl 2001, Lackey 2004</td>
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<td>Nov. 23 (M)</td>
<td>Student proposals: exchange and discussion</td>
<td>WRITTEN PROPOSALS TO GROUP</td>
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<td>Nov. 25 (W)</td>
<td>Student proposals: exchange and discussion</td>
<td>(Note: 26-29 Nov. is Thanksgiving recess)</td>
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<td>Nov. 30 (M)</td>
<td>Student presentations: practice and critique</td>
<td>Dickson and Conner 1978, Bloom 1999</td>
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<td>Dec. 2 (W)</td>
<td>Student presentations: practice and critique</td>
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<td>Dec. 7 (M)</td>
<td>Student presentations: practice and critique</td>
<td>TITLES AND BRIEF BIOGRAPHIES TO TA</td>
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<td>Dec. 9 (W)</td>
<td>Student presentations: practice and critique</td>
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<td>Dec. 11 (F)</td>
<td>GRAD RESEARCH PROPOSAL CONFERENCE – 312A HOLDSWORTH</td>
<td>HALF-DAY to ALL DAY (depending on number of presentations) (Note: 11 Dec. is the last day of classes)</td>
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