

**ENSC 5530.01**  
**Research Methods in Environmental Science**  
**Spring 2011**

**Class meetings:** Thursdays, 7:00 – 9:50 pm, SSB 3302  
**Instructor:** Dr. Cindy Howard  
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**Office hours:** Mon and Wed 3-5pm; Thu 4-6pm; other times by appointment  
**Webpage:** <http://sce.uhcl.edu/howard/>

**Course text options and materials**

- Dawson, M.M., B.A. Dawson and J.A. Overfield. 2010. *Communication skills for biosciences*. John Wiley & Sons, West Sussex, UK. 169 pp. ISBN 978-0-470-86393-0.
- Davis, M. 2004. *Scientific papers and presentations*, 2<sup>nd</sup> ed. Elsevier Science & Tech. Books, New York. 336 pp. ISBN# 0-120-88424-0.
- Alley, M. 1996. *The craft of scientific writing*, 3<sup>rd</sup> ed. Springer-Verlag, New York. 282 pp. ISBN# 0-387-94766-0.
- Booth, V. 1992. *Communicating in science: writing a scientific paper and speaking at scientific meetings*, 2<sup>nd</sup> ed. Cambridge Univ. Press, UK. 78 pp. ISBN 0-521-42915-3.
- Day, R.A. 1998. *How to write and publish a scientific paper*, 5<sup>th</sup> ed. Oryx Press, Phoenix, AZ. 275 pp. ISBN 1-57356-165-7.
- Matthews, J.R., J.M. Bowen and R.W. Matthews. 1996. *Successful scientific writing: a step by step guide for the biological and medical sciences*. Cambridge Univ. Press, Cambridge. 181 pp. ISBN# 0-521-55948-0.
- Penrose, A.M. and S.B. Katz. 1998. *Writing in the sciences: exploring conventions of scientific discourse*. St. Martin's Press, New York. 321 pp. ISBN# 0-312-11971-2.

PowerPoint slides for each lecture and other course information will be available at least one day before each class session in the course Blackboard shell (accessible online through WebCT) or at <http://sce.uhcl.edu/howard> under Courses: ENSC 5530.

**Prerequisites**

Graduate environmental science (ENSC) major in good standing; completion of STAT 5135 (Applied Statistical Methods) and advisor's approval of research project / thesis topic (see form).

**Learning outcomes**

Upon successful completion of this course, students will be able to formulate a hypothesis and objectives, critique primary research literature, make a work timeline plan, and design, write and orally present a detailed proposal for a research project.

**Course objectives**

Students will learn the elements of scientific proposal writing, including abstracts, significance and objectives statements, literature reviews, methods and materials, and data analysis planning. The final outcome of the course will be the student's research proposal for his/her master's thesis or project. **The student's performance in this course (i.e., completion and quality of research proposal) may be used to determine the student's subsequent placement in project, thesis or seminar option.** The final determination of option placement will be made by the ENSC 5530 instructor, the student's advisor and the ENSC graduate curriculum committee faculty.

**Course format**

Informal lectures and student discussions in class; individual advising on proposal writing; assignments designed to lead the student through the proposal writing process; written research proposal; oral presentation of proposal before class members and ENSC faculty.

**Evaluation**

The assignments lead to the completion of the research proposal. All assignments will be graded and available for return to the student at the class meeting time following the class period in which they were due. When turned in, each assignment must show the student's name, assignment number and date of submission.

Grades on assignments #3, 4 and 5 (only) may be increased upon satisfactory editing, following the instructor's comments and/or comments by the student's advisor. The due dates for edited assignments will be the class period one week after their return to the student. Edited assignments and other designated work may be submitted by e-mail. Assignments #5 and 6 must be reviewed and approved by the student's project advisor before the due date and submission in this class.

Students are expected to turn in assignments and make their presentations on the scheduled dates. ***If Assignments #1 and 2 are turned in late, they will be checked but will not be given credit. Other assignments and final proposals turned in late will be assessed a 10% grade penalty per week late, beginning the day following the due date.*** In general, incomplete grades are not an option in this course. ***Students should note that in order to progress from this course to conducting their research and completing the capstone ENSC 6838, they must earn a minimum grade of B- in ENSC 5530.***

### **Grading algorithm**

Assignment #1a/b/c (Research topic / question; 3 primary research articles)	10%
Assignment #2 (Intro outline, citations, specific objectives)	5%
Assignment #3 (Draft Intro)	10%
Assignment #4 (Draft Methods)	10%
Assignment #5 (Draft Proposal)	10%
Assignment #6 (Final proposal)	35%
Oral presentation	<u>10%</u>
	100%

### Grading scale:

A	92-100%	B-	78-79%	D+	66-67%
A-	88-92%	C+	76-77%	D	60-65%
B+	86-87%	C	70-75%	D-	58-59%
B	80-85%	C-	68-69%	F	<58%

Standards for grades pertaining to graduate work (from UHCL catalog):

- Performance in the range of "A" represents exceptional scholarship and intellectual initiative in accomplishing graduate level course goals and objectives.
- Performance in the range of "B" represents competent achievement in accomplishing graduate level course goals and objectives.
- Performance in the range of "C" represents the minimally acceptable performance in accomplishing graduate level course goals and objectives.
- A "D" or "F" performance represents unsatisfactory or below minimally acceptable performance in accomplishing graduate level course goals and objectives.

### **Class attendance**

Class attendance is strongly recommended. Handout materials will be available for students who miss class; however, the handouts represent outlines of lecture material and valuable information will be obtained by interacting on assignments with peers during class times. Students are encouraged to utilize advising periods with the course instructor; however, advising sessions are not required. Students are also encouraged to consult their research advisor frequently throughout the proposal development process.

Information on university closures due to weather or other events can be obtained from the UHCL hotline (281-283-2221) or <http://www.uhclmergency.info/go/site/1522/>.

The course instructor will send messages to students during the semester regarding class schedule updates or changes, using the students' university email accounts.

**Drop date**

The last date to drop this course without a grade penalty is **March 28, 2011**. Students should be fairly well along in their draft proposal by this date if they intend to complete the course during this semester.

**Academic honesty**

Please carefully review the UHCL Academic Honesty Policy in the current UHCL catalog. Every student enrolled in this class is expected to abide by the UHCL Honesty Code, which states, "I will be honest in all my academic activities and will not tolerate dishonesty." Your participation in this class constitutes your acceptance of the UHCL Academic Honesty Policy. Dishonesty of any kind (e.g., plagiarism, cheating on exams) is absolutely unacceptable in this course. All academic code violations will be reported to the Dean of Students and can result in a grade of "F" on an assignment or test, a grade of "F" in the course or suspension from the university (see catalog). Your written work may be checked for plagiarism at any time. For the full UHCL Academic Honesty Policy, please refer to [http://prtl.uhcl.edu/portal/page/portal/PRV/FORMS\\_POLICY\\_PROCEDURES/STUDENT\\_POLICIES/Academic\\_Honesty\\_Policy](http://prtl.uhcl.edu/portal/page/portal/PRV/FORMS_POLICY_PROCEDURES/STUDENT_POLICIES/Academic_Honesty_Policy).

**Special academic accommodations**

Students requiring special academic accommodations with regard to exams, etc. should contact the Disabilities Services Office at 281-283-2627 (<http://prtl.uhcl.edu/portal/page/portal/UAO>).

**Electronics**

Use of cell phones, pagers, PDAs, laptop / notebook computers or similar electronic devices is generally not permitted during class periods. Cell phones must be silenced or turned off and must be stored out of sight for the duration of the class period. Exceptions may be made on a per class period basis and must be cleared with the course instructor prior to the start of class.

*Course schedule (subject to revision); dates in bold font indicate formal class meetings*

<b>Date</b>	<b>Lecture Topic</b>	<b>Assignment</b>	<b>Due</b>
<b>01/20</b>	Course introduction Developing the topic and research question	<b>Assignment #1a:</b> Determine topic and write research question (form signed by advisor) <b>Assignment #1b:</b> Obtain 3 primary research articles from 3 different peer-reviewed scientific journals in your field	
<b>01/27</b>	Collecting information and reference materials for the proposal	<b>Assignment #1c:</b> Develop note cards from the 3 selected articles	#1a #1b
02/03	<i>No class</i>		
<b>02/10</b>	Class presentations of topics and research questions Finding and reviewing scientific literature; extracting information; avoiding plagiarism; citing references; constructing the Introduction outline; specific objectives and hypotheses	<b>Assignment #2:</b> Write detailed outline for Introduction, with citations; hypothesis, specific objectives and project significance	#1c
<b>02/17</b>	Library resources presentation; meet in UHCL Library Class discussion of Assignments #1c and #2; writing the Introduction; writing exercise; Assignment #1 returned	<b>Assignment #3:</b> Write draft Introduction, with specific objectives, hypothesis, significance and literature citations; include Literature Cited section	#2
02/24	Individual advising (5-7pm); Assignment #2 returned		
<b>03/03</b>	Writing the Methods section; human subjects and IACUC forms; data analysis planning; project evaluation planning, budgets	<b>Assignment #4:</b> Write draft Methods section, including data analysis plan and evaluation plan	#3
03/10	Individual advising (5-7pm): Assignment #3 returned		
03/17	<i>No class: Spring Break</i>		
<b>03/24</b>	Putting the proposal together, making effective oral and poster presentations	<b>Assignment #5:</b> Write draft Proposal (all sections); <i>must be reviewed and approved by project advisor before submitting</i>	#4
03/31	Individual advising (5-9pm on sign-up sheet); Assignment #4 returned		
04/07	Individual advising (5-9pm on sign-up sheet)		#5
04/14	Individual advising (5-9pm on sign-up sheet); Assignment #5 returned		
<b>04/21</b>	Attend poster presentations by ENSC 6838 students in the UHCL Student Conference for Research and the Creative Arts	<b>Assignment #6:</b> Write final Proposal; <i>must be reviewed and approved by project advisor before submitting</i>	
<b>04/28</b>	Oral presentations of research proposals		#6
<b>05/05</b>	Oral presentations of research proposals		

**Guidelines for research involving humans or animals**

If you are planning to conduct research that involves vertebrate animals or humans, you are required to include the appropriate application forms in your research proposal for ENSC 5530. You will subsequently be required to submit the application to the appropriate UHCL committee (e.g., IACUC [Institutional Animal Care and Use Committee] or CPHS [Committee for the Protection of Human Subjects]) and *receive approval before beginning any work* on your research project. IACUC and/or CPHS applications and approval documents must be included in the final research report submitted for ENSC 6838.

The required information and application forms can be found at the locations listed below.

For research involving vertebrate animals:

[http://www.research.uh.edu/Online\\_Forms/index\\_html/editor/Admin\\_info.doc](http://www.research.uh.edu/Online_Forms/index_html/editor/Admin_info.doc)

For research involving human subjects:

<http://prtl.uhcl.edu/portal/page/portal/OSP/PROTECTION%20OF%20HUMAN%20SUBJECTS>

Please print out the appropriate forms, complete them and attach to your research proposal.

# Project / Thesis Topic Approval Form

Name: \_\_\_\_\_

Semester: \_\_\_\_\_ Concentration area: \_\_\_\_\_

Planned option: Thesis \_\_\_\_\_ Project \_\_\_\_\_

Proposal topic: \_\_\_\_\_

\_\_\_\_\_

Research question: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Research Advisor: \_\_\_\_\_

Approved: \_\_\_\_\_

(Advisor's signature)

Date: \_\_\_\_\_