

# ***ENGR 190 – Creative Inquiry and Scientific Methods I***

Spring 2007

Time: Wednesdays, 9:05 – 9:55  
Location: 107 Holtzendorff Hall, unless otherwise noted  
Instructor: Dr. Lisa C. Benson, Ph.D.  
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Office Hours: By appointment

## Creative Inquiry Team Contact Information:

### ***Advanced Membranes***

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### ***Renewable Resource Polymers for Biomedical Applications***

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## COURSE OBJECTIVES:

This 2 credit course (1 hour lecture, 2 - 4 hour research lab sessions per week) will introduce students to the basic aspects of planning, developing, and executing scientific research, and presenting research results to the scientific community as well as the general public. The course is designed for undergraduate researchers participating in a Creative Inquiry team or independent research in the sciences or engineering disciplines.

## CLASS POLICY:

### Academic Integrity

"Integrity without knowledge is weak and useless, and knowledge without integrity is dangerous and dreadful."

— *Samuel Johnson, English writer and lexicographer (1709-1784)*

"As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a 'high seminary of learning.' Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form."

The Honor Code for the College of Engineering and Science/Clemson University will be applied for projects and reports.

[http://www.ces.clemson.edu/main/students/honor\\_code.htm](http://www.ces.clemson.edu/main/students/honor_code.htm)

### Attendance

If classes or lab sessions must be missed for extra-curricular activities, illness, or other reasons, the instructor or research mentor must be informed prior to absence if possible or upon return with an official, written explanation. Unexcused absences and/or tardiness may detrimentally influence grades.

### Course Grading

Homework	20%
Service Learning Project	20%
Class Participation	20%
Laboratory Practice	40%

A= 90 – 100; B = 80-89; C = 70 – 79; D = 60 – 69; F = 68 or below

COURSE OUTLINE:

Date	Topic	Assignment
1/10	Orientation and introduction of team members and mentors	Complete online chemical safety training
1/17	Laboratory and chemical safety; MSDS notebook (Bill Coburn, Dept of Chemical and Biomolecular Engineering; meet in 123 Earle Hall)	
1/24	Keeping laboratory notebooks; Elements of the scientific method	Develop research question and objectives
1/31	Conducting a literature review (Guest Speaker: Sylvia George-Williams; meet in Cooper Library)	
2/7	Critical reading exercise; bibliography software	Set up bibliography and literature review
2/14	Time management and project management; gathering and analyzing data	
2/21	<i>Roundtable discussion of research plans</i>	Begin interviews for service learning project
2/28	Electronic portfolios	
3/7	Communicating research to technical audiences (oral presentation, poster presentation, abstracts, and manuscripts)	Create 5 minute oral presentation on research progress to date
3/14	<i>Student presentations of research questions and background literature</i>	
3/21	Spring Break	
3/28	Intellectual property and entrepreneurship; collaborating with industrial partners	Complete interviews for service learning project
4/4	Communicating research to non-technical audiences <i>Student interviews</i>	Create press release about research project
4/11	<i>Review research posters</i> <i>Student press releases</i>	Create research poster with progress to date
4/18	Ethical issues in scientific research (Guest speaker: Dr. Kelly Smith, Philosophy and Religion Dept.)	Focus on Creative Inquiry Poster Session, 4/16
4/25	<i>Student final presentations of preliminary research</i>	

REQUIRED TEXT: None

RECOMMENDED RESOURCES:

Asking the Right Questions: A Guide to Critical Thinking, M. Neil Brown and Stuart Keeley, 2001, Prentice-Hall Inc. (ISBN 0-13-089134-7)

Writing Science through Critical Thinking (Jones and Bartlett Series in Logic, Critical Thinking, and Scientific Method), Marilyn Moriarty, 1997 (ISBN 13: 978-0867205107)

Doing Science: Design, Analysis, and Communication of Scientific Research, Ivan Valiela, 2000. Oxford University Press, USA (ISBN 13: 978-0195134131)

Writing Guidelines for Engineering Students: <http://www.writing.eng.vt.edu/>  
Michael Alley, Virginia Tech Dept of Engineering Education

Other references can be found on Blackboard (S0701\_ENGR 190101). The list of resources will be updated periodically, so check the list throughout the semester.