SYLLABUS
ME 582
Experimental Research Methods (1cr)
August 19, 2013

Meeting Place and Time
Engineering A-111, Monday 9-9:50, except as noted in the schedule

Instructor
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Office hours: Monday 7-9, or by appointment.

Objectives
To introduce new graduate students to important topics for experimental research in mechanical engineering and energy processes.

Description
This course will cover topics which deal with conducting experiments, issues with measurements and data analysis you may encounter in your research. Only brief coverage will be possible in this course. Further exposure will likely be necessary from your advisor (when chosen) or in other classes.

Topics (number of class periods)
Topics include:

- Introduction (1)
- Hypothesis Driven Research (1)
- Library research (1)
- Safe Laboratory Practices (1)
- Experimental research-Scientific Method vs. Engineering Method (1)
- Identification of key variables (1)
- Uncertainty analysis of experimental measurements (2)
- Experimental design vs. a theoretical model (1)
- An introduction on experimental design and its benefits (1)
- Obtaining relevant engineering data (3)

Attendance
Required course by the Mechanical Engineering and Energy Processes Department for Graduate Students.

Grades
Grades will be based on an evaluation of an electronic copy of a midterm paper which discusses the subject matter presented in the course. More about the paper and it's grading will be available discussed in class and sent through email. Do your own work and follow Guidelines for Responsible Conduct of Research. The other half of your grade will be on the Lab Report.

Emergency Procedures

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in building on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. **It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency.** The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

Schedule, Topics, Assignments

Schedule (T=Tuesday and R= Thursday)

DATE	TOPICS	DESCRIPTIONS/SUPPORTING INFORMATION
8-19	Introduction	Syllabus http://www.orda.siuc.edu/general/rcr.html www.cgte.siuc.edu
8-26	Experimental Research – Hypothesis Driven Research	
R. 8-27/28	Laboratory Safety Training Environmental Health and Safety	***Directions for Paper on Experimental Design***
9-2	**Labor Day**	
9-9	Library Research	http://libguides.lib.siu.edu/newgrad
9-16	Experimental Research-Scientific Method vs. Engineering Method	What Is the scientific method.ppt http://www.experiment-resources.com/what-is-the-scientific-method.html What is the Engineering Method.ppt http://www.fjc.gov/public/pdf.nsf/lookup/sciman10.pdf/$file/sciman10.pdf
9-23	Identification of Key parameters	
9-30	Experiments-Are Results	To be used in conjunction with faculty overview or related coursework -Saving and Preserving Data

	Really Different?	
10-7	Uncertainty Analysis of Experimental Measurements	
10-14	**Fall Break**	
10-21	Experimental design vs. a theoretical model	
10-28	An introduction on design of experiments and its benefits	
11-4	Obtaining Statistically Relevant Engineering Data	
11-11	**Veteran's Day**	
11-18	One Laboratory Experiment	***Turn in E-copy of Paper on Experimental Processes*** Hands-on demonstrations
11-25	Discussions on Lab Findings ***Turn in Lab Report***	***Turn in e-copy of Lab Report***
12-2	Discussion-Class Evaluations	
Finals Week	Nothing Due	