

**BE 2350 Experimental Methods for Engineers  
Spring 2009**

**Credit hours:** 3 (2 hours lecture; 3 hour. lab)

**Location and Time:** 213 Tureaud Hall; 8:10-9 AM T/Th; Lab M, T 1:40-4:30

**Description:** *Prerequisite: BE 2352.* Introduction to experimental methods, technical report writing, and instrumentation for engineering applications; measurement of temperature, pressure, flow, strain, and vibration in biological products; microprocessor data loggers and computer data acquisition systems.

**Objectives:** To understand basic experimental design, measurement, control, data acquisition and analysis. Hands-on work will include electronics and instrumentation, and the use, collection, and analysis of data from data-loggers, computers or microdevices.

**Instructor:** Dr. Mike Mailander Rm. 167 E.B. Doran, Phone # 225-578-1058, E-mail:[aemail@lsu.edu](mailto:aemail@lsu.edu);  
Office hours: T, Th: 9:00-10:00 am or by appointment.

TA: Ms. Anna Charron Dugas ([acharron@lsu.edu](mailto:acharron@lsu.edu))

Also assisting: Robert Egnatchik ([regnat1@lsu.edu](mailto:regnat1@lsu.edu))

Text: *Experimental Methods for Engineers*, seventh edition, by J. P. Holman, McGraw-Hill, 2001.

**Criteria for Determining Grade:**

Homework	20%
Lab reports	20%
Quizzes	5%
Mid-term Exam	20%
Final Exam	35%

The final course grade will be determined from the following scale:

A > 90%, 80% < B < 90%, 70% < C < 80%, 60% < D < 70%, F < 60%.

**Course Policies, Regulations and Procedures:**

Attendance and participation is required. The Instructor is not responsible for makeup work or informing students of makeup work.

Homework is due at the beginning of class on the due date.

Exams will typically be divided into open book and closed book sections.

Examinations and labs missed due to an unexcused absence cannot be made up and a grade of zero will be given for each one missed.

Any student requiring special arrangements for taking exams, taking-notes and other special arrangements please see or contact the instructor within the first two weeks of class.

I am available for questions outside of class. Please stop by my office if you need my help. If I am busy and do not have time to meet with you, I will tell you and we can schedule a meeting at another time. If you have trouble finding me, or our schedules do not coincide, you can make an appointment by either e-mail or phone. If we make an appointment and you cannot attend, please call and cancel as soon as you can.

#### Web Page

A course web page will be made available through Moodle to enhance the course contents. Students are requested to visit this web site on a regular basis. The course web site contains the course syllabus, the lecture schedule, lecture notes, and review materials.

#### Academic Integrity and Academic Misconduct

Students are expected to comply with the Code of Student Conduct at all times throughout this course.

For your information, the Code of Student Conduct can be found at:

[http://appl015.lsu.edu/slas/dos.nsf/\\$Content/Code+of+Conduct?OpenDocument](http://appl015.lsu.edu/slas/dos.nsf/$Content/Code+of+Conduct?OpenDocument)

Course schedule, subject to change.

Date	Topic	Assignment due
13-Jan	1-Introduction to course	
15-Jan	2-Basic Concepts	Read Ch 1 and 2.1-2.6, and 2.11
LAB	No Lab - beginning of course	
20-Jan	3-Measurement Systems	Rd 2.11
22-Jan	4-Uncertainty	Rd 3.1-3.3.5
LAB	No lab MLK - prep for lab #1	
27-Jan	5-Statistical Analysis	Rd 3.6-3.15 + How would you..
29-Jan	6-Graphical Analysis	Rd 3.16-3.19, problems 3.1-3.5
LAB	#1 - Plastic Forks	
3-Feb	7-Electronics #1	Read Lab #2 notes (Moodle)
5-Feb	8-Transducers	Read 4.19-4.31, Problems 3-16,22,51,61 and 76,
LAB	#2 Basic electronics	
10-Feb	9-Transducers (cont)	
12-Feb	10-D/A Converters	Read 14.5
LAB	#3 Introduction to the Basic Stamp	

17-Feb	11-A/D conversion	Organize lawsuit arguments
19-Feb	12-Present arguments	
LAB	#4 Basic Stamp - A/D conversion	
24-Feb	Mardi Gras	
26-Feb	13-Filters, power supplies, and transformers	Read 4.10-4.14
LAB	Mardi Gras	
3-Mar	14- Dynamic Measurement & Oscilloscopes	Read 2.7-2.10
5-Mar	Mid-term Exam	Read Lab#5 handout
LAB	LAB EXAM	
10-Mar	15-Introduction to Biosensors	Read handout
12-Mar	16-Biosensors (cont) - Dr. Mailander out of town	Read Lab #6 handout, problems
LAB	#5 Biosensors	
17-Mar	17-Temperature Measurement	Read Chapter 8.1-8.5,8.12
19-Mar	18- Pressure Measurement	Read 6.1-6.9 & Problems 6&8
LAB	#6 Introduction to transducers & temperature measurement	
24-Mar	19- Flow measurement	Read 7.1-7.9
26-Mar	20- Matlab	Handout & problems
LAB	#7 Data Acquisition & Logging Part 1 - Pace loggers & pressure	
31-Mar	21- Labview	Read handout
2-Apr	22- Labview (cont)	Program due
LAB	#8 Data Acquisition Part 2 - Serial Communication with RS-232 & USB	
7-Apr	Spring Break	
9-Apr	Spring Break	
LAB	Spring Break	
14-Apr	23- Bridges and amplifiers	Rd 4.6-4.7
16-Apr	24-Strain gages	Rd 10, Homework due
LAB	#9 pH Measurement (Orion meters)	
21-Apr	25- Force, torque and strain	
23-Apr	26- Bio-mechanical measurements	Read handout, last homework
LAB	#10 Strain Gages and load cells	

28-Apr	27- special topics or catch-up	
30-Apr	28-Review	
LAB		
7-May	Final Exam (Thursday)	7:30-9:30