E80 Spring 2008
Course Final Assessment

Name _____

Section (circle) 1(MT) 2(TW) 3(WTh) 4(ThF)   Professor _____

Note: The results of this survey will not be used in any form of summative evaluation, (e.g., grading) and your name will not be known by anyone other than the compiler of the data. The inclusion of your name is purely to permit tracking of cohorts with regard to individual changes rather than trying to infer individual changes from group data. We will not use your name in any of the reports generated from this survey.

Course Objectives:
By the end of the course students will:

1. Demonstrate hardware and equipments skills:
   1.A. Demonstrate the safe and proper use of basic laboratory equipment: e.g., digital multimeter (DMM), signal generator, oscilloscope, breadboard, and analog transducers.
   1.B. Demonstrate the safe and proper use of computer and embedded-processor-based data acquisition systems.

2. Demonstrate experimental and analytical skills:
   2.A. Demonstrate the design and completion of safe experiments to answer open-ended questions.
   2.B. Demonstrate manipulation and presentation of experimentally-obtained data to answer open-ended questions.
   2.C. Analyze and compare the results of mathematical and computer modeling of an experiment with actual experimental results.

3. Demonstrate the beginnings of professional practice:
   3.A. Effectively communicate in written form the design, completion, and analysis of experiments to answer open-ended questions.
   3.B. Effectively communicate by oral presentation and Q-and-A session the design, completion, and analysis of experiments to answer open-ended questions.

#	Question						
1	How would you rate your skill with basic laboratory equipment such as a DMM, oscilloscope, or pressure gauge?	PreE80	Ouch	Poor	Fair	Good	Wow
		PostE80	Ouch	Poor	Fair	Good	Wow
2	How would you rate your skill at using a computer-based or embedded-processor DAQ?	PreE80	Ouch	Poor	Fair	Good	Wow
		PostE80	Ouch	Poor	Fair	Good	Wow
3	How would you rate your skill at designing and completing an experiment to answer an open-ended question?	PreE80	Ouch	Poor	Fair	Good	Wow
		PostE80	Ouch	Poor	Fair	Good	Wow
4	How would you rate your skill at manipulating and presenting experimental data?	PreE80	Ouch	Poor	Fair	Good	Wow
		PostE80	Ouch	Poor	Fair	Good	Wow
5	How would you rate your skill at comparing the results of an experiment with analytical or computer models of the experiment and analyzing the comparison?	PreE80	Ouch	Poor	Fair	Good	Wow
		PostE80	Ouch	Poor	Fair	Good	Wow
6	How would you rate your skill at writing a report in proper technical English that effectively communicates the design, completion, and analysis of an experiment?	PreE80	Ouch	Poor	Fair	Good	Wow
		PostE80	Ouch	Poor	Fair	Good	Wow
7	How would you rate your skill at preparing and delivering an oral presentation that effectively communicates the design, completion, and analysis of an experiment?	PreE80	Ouch	Poor	Fair	Good	Wow
		PostE80	Ouch	Poor	Fair	Good	Wow
8	How would you rate E80 as an effective and enjoyable class?	PreE80	Ouch	Poor	Fair	Good	Wow
		PostE80	Ouch	Poor	Fair	Good	Wow

Each individual experiment has objective geared to helping accomplish the overall course objectives. For each of the experiments we would like your assessment of:
1. Whether or not the experiment objectives are appropriate, help toward accomplishing the overall objectives, and worth accomplishing (abbreviated App.),
2. Whether or not the experiment is properly designed to accomplish the objectives (abbreviated Des.),
3. How you did personally on each of the objectives (abbreviated Me),
Also needed improvements in the experiment, the lecture for the experiment, the on-line resources, and any other comments.

B.E.M. Week 1

Demonstrate the proper use of a digital multimeter, an analog multimeter, an oscilloscope, and a signal generator in performing basic electrical measurements.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Demonstrate and explain the effects of instrument loading (impedance) on basic electrical measurements.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Demonstrate theoretical and practical usage of a voltage divider for both pure resistive and complex impedances.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Demonstrate proper measurement and reporting of frequency response functions.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

B.E.M. Week 2

Understand the general function and usage of basic op-amp circuits.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Analyze various op-amp circuits based on ideal model of op-amp.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Design and build simple op-amp circuits to serve various purposes.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Measure the frequency response of a given system and make Bode plots.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

B.E.M. Week 3

Design and build signal conditioning circuitry to interface transducers with a DAQ.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Perform and report DC measurements and processing on a transducer with both a computer-based and an embedded-processor-based DAQ.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Perform and report AC (frequency-response) measurements on a system with both a computer-based and an embedded-processor-based DAQ.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Demonstrate the uses of the Nyquist limit and foldover.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

Wind Tunnel

Demonstrate the safe start-up and shut-down sequence for the wind tunnel.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Set and verify the wind speed in the wind tunnel.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Compare measured drag forces on standard shapes in a flow field with literature values.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Model and Measure the drag forces on the rocket in various configurations in a flow field.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Calibrate the Pitot sensor in the rocket nose cone.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

Motor Static Test

Measure the thrust curves for three rocket motors.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Develop a relationship between a thrust curve and calculatable kinetic parameters.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Use the measured thrust curve to calculate and analyze the kinetic data.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

Dynamic Beam

Compare the measured vibrational modes of a hollow tube with the theoretical predictions.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Explain the difference between a dynamic strain gauge and an accelerometer.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Measure the vibrational modes on a rocket.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Determine how the expected vibrational modes can be measured with a low-resolution, low-frequency embedded DAQ.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Compare a simple spring-mass-damper model with a more-advanced continuum vibrational model.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

Accel & Gyro Cal

Develop and implement a method to calibrate MEMS accelerometers.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Develop and implement a method to calibrate MEMS rate gyroscopes.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Demonstrate an understanding of the difference between ideal and real performance of sensors.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

Press & Temp Cal

		Ouch	Poor	Fair	Good	Wow
Determine the calibration constants for a pressure sensor from empirical data.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Determine the Steinhart-Hart constants for a thermocouple from empirical data.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Develop a relationship to convert from pressure to altitude and vice versa with a standard atmosphere.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

Flight Modeling

		Ouch	Poor	Fair	Good	Wow
Develop a numerical model of rocket flight from lift-off to touchdown and use that model and data they have collected to predict their rocket's flight.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Compare their code results with results from commercial rocket codes.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Develop numerical routines to analyze their flight data for comparison with their models.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

Rocket Launch

Create a flight plan with objectives and prepare the rocket for launch.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Launch the rocket and collect real-time telemetry during the flight.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Recover the rocket and analyze the on-board and telemetry data.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Prepare a revised flight plan in response to the data analysis and repeat the cycle.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

Final Report and Presentation

Produce a formal written report in proper technical English on the comparison of the flight data with the modeling.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Present the results of the flight in a formal presentation.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow
Demonstrate an understanding of the data and model through a question-and-answer session.	App.	Ouch	Poor	Fair	Good	Wow
	Des.	Ouch	Poor	Fair	Good	Wow
	Me	Ouch	Poor	Fair	Good	Wow

Needed Improvements:

Other Comments:

For the course overall, what was the most useful or enjoyable portion of the course?

For the course overall, what portion of the course was the least useful or enjoyable, or that has the greatest need of revision?

For the course overall, are there any other comments?