

The Ohio State University  
Fundamentals of Engineering for Honors

**ENG H191 – Laboratory Component**

Autumn 2006

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209 Hitchcock Hall

**Web Page:** <http://feh.osu.edu/Labs/labs.html>

Website will contain lab write ups, lectures, lab report guidelines and other material where appropriate

**Lectures:** Wed, Thurs, or Fri class, 208 Hitchcock Hall

**Office Hours:** Announced during lab and posted outside GTA office.

**Text:** Lab write-ups and lectures available for download on course website.

**Grading:** The course component, worth 25% of the final grade, will be based on attendance, lab reports and worksheets, and lab quizzes. Tentative assignments are listed under “Topics.”

**Prerequisites:** (1) High School level physics  
(2) Pre-Calculus

**Objectives:** To develop an understanding of fundamental engineering principles  
To develop an understanding and appreciation of engineering analysis  
To develop an technical vocabulary  
To develop an understanding of the uses of common engineering tools  
To learn correct uses and applications for a variety of measurement tools  
To improve team work and group work skills  
To improve technical writing skills, particularly lab reports and memos  
To become familiar with introductory topics in a variety of engineering fields

**Expectations:** Students are expected to prepare for every lab by reading and familiarizing themselves with the lab write-ups available on-line. Pop-quizzes will be administered during the quarter in each lab section. Many of the labs are discovery labs – the procedure is outlined in the write-up but it is the students’ job to determine the required information by observation or experimentation as defined within the lab constraints. Lab UTAs and GTAs are available for questions, exposition, and trouble-shooting. Students are responsible for all group work and for following team agreements. Problems with groups may be brought to the lab GTAs, but it is the team’s responsibility to ensure that all work is completed in a timely manner.

**Topics: Marble Carrier** Work in design teams to create a device to transport marbles to a specific location (in class worksheet – no lab report)

**Spot Speed Study** Collect data in teams on traffic patterns near campus. Primarily Civil Engineering, with ISE principles as part of the analysis. (individual report – *Cover Page, Results, Discussion and Conclusions only*)

**DC Motors** Observe different types of DC motors, determine the mechanism differences. Electrical Engineering. (Formal Lab Report – Group, with team agreement)

**Falling Ball Viscometer** Determine the viscosities of three different liquids using a LabVIEW data acquisition application. Chemical Engineering. (Formal Lab Report – Individual)

**Mechanical Elements** Use knowledge of springs, levers, gears and chains to determine solutions to different problems. Mechanical Engineering (Worksheet - Individual)

**AC Electricity** Build a model AC system and determine power loss, current and voltage transformations, and other effects. Electrical Engineering. (Formal Lab Report – Group, with team agreement)

**Beam Bending and Welding** Experimentally determine Young's Modulus for various materials, learn good welding practices. Material Science and Welding. (Formal Lab Report – Individual)

**Measurements** Apply dimensioning practices from the quarter to dimension actual objects in the lab. Learn correct uses and applications for a variety of measurement tools. (Formal Lab Report – Group, with team agreement)

**Late Policy:** No late material (reports, worksheets, etc.) will be accepted after 24 hours unless prior arrangements have been made. Arrangements need to be made at least 24 hours in advance. Any emergency situation will be handled on a case by case basis. Any assignment turned in late will be graded for a maximum of 70%. Missed quizzes may be made-up at the discretion of the GTA.

**Attendance:** The student is responsible for all assignments, changes to assignments, announcements, quizzes and subject material presented during the regularly scheduled lab lecture. If a lab is missed, the student must make arrangements to make up the laboratory work. Missed labs for an unexcused absence will result in an automatic deduction of 30% of the grade. Subsequent unexcused missed labs may not be made up.

**Honor System:** All reports, worksheets, and quizzes in this course will must be accomplished in accordance with the FEH Honor System. This means that *all submitted work must be your own*. While discussions among students relating to the labs are permitted (and often encouraged), a student's submitted assignment must reflect his/her *own* understanding of the material. Group labs are expected to be the combined work of all members. Discussion of a quiz is strictly prohibited until after the quiz is submitted, and must not be discussed among sections.