

MAE 212: Spring 2001

LABORATORY OVERVIEW

The laboratory component of MAE212 consists of three modules. Each module is three-weeks long. Labs start Monday, January 22nd, the first week of classes. The titles and main features of these modules are the following:

- **MODULE I: Deformation Processing Module:** Here you will perform a sequence of deformation experiments and measure basic material properties needed to describe both elastic (recoverable) and plastic (non-recoverable) deformation.
- **MODULE II: Hardenability of Carbon and Alloy Steels:** In this lab you will study hardening by quenching from high temperatures. You will also learn how to develop programs, called VI's or virtual instruments using National Instrument's software package LabView.
- **MODULE III: Material Property Characterization using strain gage instrumentation:** In this lab you will learn to glue, solder and configure strain gages. You will also learn about the circuitry and instrumentation used with strain gages. You will use them to determine the yield stress of an aluminum alloy and to determine anisotropic elastic properties of the material a common pressure vessel if made of. You will also measure the pressure of this vessel.

During the first week of classes you will be assigned by Email in a group of approximately 8 students (three groups per day). For the next three weeks, group 1 will perform Module I, group 2 Module II, etc. After three weeks, group 1 will continue with Module II, group 2 with Module III, etc. It is absolutely necessary that you remain in the same laboratory group for the remaining of the semester.

Before you come to the lab (including the first week of classes!) and during the lab:

- Read the lab safety information carefully and follow ALL guidelines
- Bring to the lab your safety glasses. They are available at the campus store (or you will most probably get them from the MAE225 desk in the Emerson laboratory when you come to your MAE212 lab)
- Read the description of your lab module that you have been assigned and bring this manual with you to the lab together with your laboratory notebook. The lab manual should be downloaded and printed before you come to the lab.

Notes:

- Module II requires LabView. You can use this program in the Upson computer room (ATC facility, Upson B17). You can login with Username: MAE212, Password: 4UtoDo
- LabView 5.0 can be purchased from the bookstore or elsewhere – note however that in the lab we run an older version!

- Data from your experiments will be placed on the course web site. There will be a directory with sub-directories/files identified by module, date and lab group.
- The labs and lectures are not synchronized in this class. You will have material in the lab that has not yet covered in the lecture. You are responsible to learn what you need for the labs. Read the lab manual and recommended readings and ask your lab TAs questions!
- Your participation in the lab is significant part of your lab grade. In addition you should be prepared to answer technical questions posed by your TA – serious part of your grade depends on your answers!
- You should keep a neat lab notebook or binder in which to take notes, make calculations, collect handouts, etc. Although much of the data taken in these labs will be digital you will still need to write down a lot. In lab note taking, more is generally better.
- You will work in groups in this lab and you are encouraged to work together to complete the analyses. However, any work you turn must be your own. Copying is not allowed. In your report, state clearly with whom you worked and discussed the material with. Submitting a lab report using data of another group from another lab day will result in an immediate 0 grade of your lab report.
- Your lab TA will be available for discussing with you any aspects of the lab or lab report preparation/grading in times outside the regular lab times based on mutual agreement. Please Email your TA to schedule such meetings as needed. If you have any concerns with the grading of your lab report, please talk to your TA within a week from the time the report was returned to you (Email addresses of your lab TAs are given in the course syllabus). Do not wait until the end of the semester when you suddenly realize that lab grades are indeed very important!