MECH 200: Engineering Drawing Lab Manual

Introduction

The CAD Laboratory portion of Engineering Drawing 200 teaches working proficiency in CAD programs, such as AutoCAD and Pro/ENGINEER. Labs 1 through 4 involve progressive theory and exercises that will provide you with an understanding of Engineering Graphics applications, as well as a working knowledge of the CAD software.

This online document is the MECH 200 Lab Manual: You will find this manual an invaluable guide to the theory and inner workings of the CAD program, and it is required that you read through each lab thoroughly before attending your assigned lab section. This is a minimum amount of preparation, and will make the labs more enlightening and less tedious for you. Your laboratory Teaching Assistant will use this document as the basis for any lecturing that takes place during lab time, so things will make a lot more sense if you are prepared!

Lab Manual Organization

Each of the four CAD labs is organized as follows:

Objective: A short statement of what the lab's objectives are.

Introduction & Concepts: A large part of the difficulty with learning CAD is mastering its concepts. Frustrations and difficulties arise when students try to follow procedural instructions without understanding the underlying concepts. Read this section thoroughly before you try to tackle each lab: It will make the instructions in the Procedures section ten times more helpful.

Procedures: This section contains step-by-step instructions for many of the various CAD operations you will need to do in each lab. You will not be able to get through by blindly following the steps listed here and hoping that the results are enough to please your Lab Instructor. You will find that many of the steps require an understanding of the lab's concepts and theory, so be sure to master the material in the Concepts section before attempting to follow these procedures.

Deliverables: To ensure there is no misunderstanding of what you are expected to do, this section provides a complete list of all work you must deliver to complete the lab successfully. Bear in mind that your individual lab instructor may have additions to this list, so pay attention in the lab as well!

The Figure Menu and Specification Viewer

When you load lab1 and 2, your browser will open a secondary window called the Specification Viewer, which contains any lab figures larger than 800 by 700 pixels in size.

For easy layout and printing, none of the figures in the lab manual exceed the size of 800 x 600 pixels. Most of the time you will find these illustrations adequate, but some of the detailed specification drawings you will consult during these labs are better viewed in higher resolutions than this. The Specification Viewer contains versions of the figures that are up to 1024 x 768 pixels in size, which are made for detailed examination. Besides giving you access to higher resolution figures, the Specification Viewer allows you to consult each lab's specifications without losing your place in the manual's text. When you are running your browser and AutoCAD simultaneously you will find this
feature to be of great value, so get the hang of using <Alt> <Tab> to move between windows now so you can reap the benefits later.

**Additional Sources of AutoCAD Information**

Take note that this lab manual is only one of the many sources of AutoCAD information available to you. A number of AutoCAD reference manuals are available for use in the lab, and are valuable supplementary reading. In addition, you may find it wise to purchase a third party AutoCAD book at your local computer book store (Bolen Books in Hillside Mall is a great example): These books are well written and loaded with wisdom and techniques that will greatly enhance your learning of Computer Aided Drafting and Design (CAD).

**Labs 1 to 4**

Each lab in this course is designed to build on the knowledge gained from those before it: By following their sequence, a complete novice can learn enough techniques and theory to be an effective CAD technician. Nothing is a substitute for experience, of course: The lessons taught here are only meant to launch your Computer Aided Drafting abilities... It's up to you to develop them into career quality skills.

**Lab 1: Basic AutoCAD 2-D Drawings**

Drawing commands and menus. Draw and position lines, circles and chamfers. Group, duplicate, translate and rotate. Save and print drawing files.
Time to complete this lab: 1 week

**Lab 2: Multiple 2-D Orthographic Drawings**

Layers, text, dimensions and title blocks. Time to complete this lab: 1 week

**Lab 3: 2-D Assembly Drawings**

Group, form blocks, translate and remove hidden lines. Use of micrometer and vernier caliper. Measure and make component and assembly drawings of the rotor, shaft, bushing, pillow-blocks and baseplate.
Time to complete this lab: 1 weeks

**Lab 4: 3-D Modelling in Orthographic and Isometric Drawings**

Create 3-D modeling using Pro/ENGINEER and thereby generate orthographic and sectional view.
Time to complete this lab: 2 weeks

**Submitting Drawing Files**

Submit drawing electronically following the instruction giving in the section Submitting Lab Assignments posted on [http://www.engr.uvic.ca/~submit/newsupload.cgi/mech200](http://www.engr.uvic.ca/~submit/newsupload.cgi/mech200)

**Viewing Your Lab Grades Online**

The marked Labs will be posted electronically