

# Engineering & Society Syllabus

## ETec 110 Engineering Design Graphics I

Jeffrey L. Newcomer

### Texts:

*CATIA: Introduction to Modeling Version 5, Release 11. Ascent*, Ascent, 2003

*Engineering Design: A Project-Based Introduction, 2nd Ed.*, C. L. Dym and P. Little, Wiley, 2004

*Visualization, Sketching and Freehand Drawing for Engineering Design*, Raudebaugh, SDC, '99

### Equipment:

No. 2 pencil, or artist's or mechanical pencil

iomega zip 100 disk formatted for PC (preferred) or 3.5" computer disk

9" x 12" pad of drawing paper

**Course Description:** This course introduces students to the concepts and skills in visualization, freehand drawing/sketching, technical sketching, 3-D thinking and 3-D solid modeling which are associated with modern engineering design, the engineering design process, design analysis, rapid prototyping and concurrent engineering.

### Course Goals:

1. To develop a basic understanding of the engineering design process and concurrent engineering and to develop the ability to solve an engineering problem using the engineering design process both on an individual basis and as part of an engineering team.
2. To develop the necessary visualization and freehand drawing/sketching skills that will enable students of design (engineering, industrial, architectural, etc.), to express graphically a rapid succession of ideas in seeking solutions to specified design problems.
3. To develop initial CAD (Computer Aided Design Drafting) skills and understanding of the concepts associated with 3-D parametric solid modeling as an integral part of the design process and concurrent engineering.

### Grading:

In-class drawings (8)	8%
Homework drawings (8)	8%
Computer assignments (40)	39%
Lecture Quiz (R 5/27)	5%
Design Project One	5%
Team Design Project	20%
Final Project	15% (due Monday June 7, 2004 at 5:00 p.m.)
Course Grade	100% x lab fee score (see below)

All assignments will be graded based on on-time completion and accuracy. Late assignments will be accepted for half credit for up to one week after they are due, although all assignments must be turned in by the last day of classes: Friday June 4, 2004. Incorrect computer assignments will also receive half credit, although students will have one opportunity to resubmit a corrected computer assignment within two days of receiving notice of the error(s) or problem(s); completely correct resubmitted assignments will receive full credit.

**Lab Fee:** All students must pay for the course materials, which includes a \$5.00 base fee, a \$5.00 rapid prototype material fee, and a \$65.00 CATIA textbook and CD fee (waivable if you acquire your own copy). You must pay these fees before you can receive a CATIA text and before you can

build your part for the first design project. Students who have paid their lab fees will have a lab fee score of 1, those who do not will have a lab fee score of 0.

### **Course Outline:**

#### **WEEK 1**

Drw/Dsgn: Intro. to graphics concepts/history/justification of structure (Read Raudebaugh Chps. 1-3)

Lecture: Intro. to the Design Process (Read Dym & Little Chps. 1-2)

#### **WEEK 2**

CAD Lab: Creating Sketches in CATIA

Drw/Dsgn Lab: Blind contour and gesture drawings, and team formation (Read Raudebaugh Chp. 4)

Lecture: Design Ethics and Teamwork (Read Dym & Little Chps. 3, 9)

#### **WEEK 3**

CAD Lab: Basic part and feature creation in CATIA

Drw/Dsgn Lab: Modified contour drawings and Fcn. vs. Obj. vs. Constr.

Lecture: Materials and Processing (Read Dym & Little Chp. 4, 7)

#### **WEEK 4**

CAD Lab: Dress up features and more complex parts in CATIA

Drw/Dsgn Lab: Negative space drawings and Fcn. specs. (Read Raudebaugh Chp. 5)

Lecture: Lab Tours (Read Dym & Little Chp. 5)

#### **WEEK 5**

CAD Lab: Short cuts, extra features, and measurements in CATIA

Drw/Dsgn Lab: Perspective drawings and Ideation sketching (Read Raudebaugh Chps. 6-7)

Lecture: Concurrent Engineering (Read Dym & Little Chps. 8)

#### **WEEK 6**

CAD Lab: Ribs, slots, and lofts in CATIA

Drw/Dsgn Lab: Axonometric and iteration drawings, and Concept rankings (Read Raudebaugh Chps. 9-11)

Lecture: Engineering Drawings – Orthographic and Assembly Drawings, and Dimensioning

#### **WEEK 7**

CAD Lab: Assemblies in CATIA

Drw/Dsgn Lab: Orthographic, Dimensioned, & Assembly drawings (Read Raudebaugh Chp. 12)

Lecture: Advanced Computer Tools

#### **WEEK 8**

CAD Lab: Drawings in CATIA

Drw/Dsgn Lab: Time to work

Lecture: Reports and Presentations (Read Dym & Little Chp. 6)

#### **WEEK 9**

CAD Lab: Time to work

Drw/Dsgn Lab: Time to work

Lecture: Lecture Quiz (R 5/27)

#### **WEEK 10**

CAD Lab: None (Memorial Day)

Drw/Dsgn Lab: **Team Project Presentations and Team Projects Due Wednesday 6/2**

Lecture: None

### **COMPUTER ASSIGNMENTS AND DUE DATES**

<b>Part</b>	<b>Due</b>	<b>Chk</b>	<b>Part</b>	<b>Due</b>	<b>Chk</b>
Chapter 3 Exercise 3a	F 4/9		Chapter 12 Exercise 12a	F 4/30	
Chapter 3 Exercise 3b	F 4/9		Chapter 12 Exercise 12b	F 4/30	
Chapter 4 Exercise 4a	M 4/12		Chapter 12 Exercise 12c	F 4/30	
Chapter 4 Exercise 4b	M 4/12		Chapter 13 Exercise 13a	M 5/3	

Chapter 5 Exercise 5a	F 4/16	Chapter 13 Exercise 13b	M 5/3
Chapter 5 Exercise 5b	F 4/16	Chapter 15 Exercise 15a*	M 5/3*
Chapter 5 Exercise 5c	F 4/16	Chapter 16 Exercise 16a	F 5/7
Chapter 5 Exercise 5d	F 4/16	Chapter 16 Exercise 16b	F 5/7
Chapter 6 Exercise 6a	M 4/19	Chapter 17 Exercise 17a	M 5/10
Chapter 6 Exercise 6b	M 4/19	Chapter 17 Exercise 17b	M 5/10
Chapter 6 Exercise 6c	M 4/19	Chapter 19 Exercise 19a	F 5/14
Chapter 7 Exercise 7a	M 4/19	Chapter 19 Exercise 19b	F 5/14
Chapter 7 Exercise 7b	M 4/19	Chapter 19 Exercise 19c	F 5/14
Chapter 7 Exercise 7c	M 4/19	Chapter 20 Exercise 20a	M 5/17
Chapter 9 Exercise 9a	F 4/23	Chapter 21 Exercise 21a	M 5/17
Chapter 10 Exercise 10a	F 4/23	Chapter 22 Exercise 22a	M 5/17
Chapter 10 Exercise 10b	F 4/23	Chapter 23 Exercise 23a	F 5/21
Chapter 11 Exercise 11a	M 4/26	Chapter 24 Exercise 24a	F 5/21
Chapter 11 Exercise 11b	M 4/26	Chapter 24 Exercise 24b	F 5/21
Chapter 11 Exercise 11d	M 4/26	Chapter 24 Exercise 24c	F 5/21

**\*Assignment has no output and is not graded, but do it anyway!**

## **ROOM 308**

### **LAB RULES AND POLICIES**

The following rules and policies apply to computers and associated hardware and software within Room 308 of the Ross Engineering Technology Building:

- Computer hardware and software are to be used for Engineering Technology related academic course work. Other labs are available on campus for personal use.
- Unauthorized loading of computer software applications is strictly prohibited. Students found loading unauthorized software will, at a minimum, have their login accounts terminated. Additional penalties could include dismissal from the course and from the institution.
- Students are authorized to log in to one workstation only. Students found logging into more than one workstation will have their login accounts terminated.
- Student fileservers are to be used for temporary storage only. Unless prior arrangements are made, student directories will be erased at the end of each quarter. Students are individually responsible for archiving and/or backing up their own work.
- Unauthorized locking out of a computer monitor is strictly prohibited. Students found locking a monitor will have their login accounts terminated.
- Having food or drink in the room is strictly prohibited.

**Academic Honesty** : Everyone is expected to produce their own work. Acts of academic dishonesty include, but are not limited to:

- Copying a completed or partially completed assignment performed by another student and

submitting it as your own.

- Claiming credit for someone else's work.
- Collaborating with others in a required assignment without the approval of the instructor

Any student found to have committed an act of academic dishonesty will receive a grade of F in the course and may be subject to dismissal from school. For more information about Western's dishonesty policy refer to Appendix D in the college bulletin (p. 348 of the 2002-2003 Bulletin).