

**WORCESTER POLYTECHNIC INSTITUTE**  
**ES 1310 – ENGINEERING DESIGN GRAPHICS**

**Introduction to Computer Aided Design**

**Course Information: TERM B '99**

<http://me.wpi.edu/~es1310/>

**Class Hours:** Lectures: TRF/12:00-12:50  
Laboratory. Section 1: M/13:00-14:50  
Section 2: M/9:00-10:50

**Instructor:** Cosme Furlong  
**Office:** Higgins Labs Rooms 151 / 039 (Laser Laboratory)  
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**Office Hrs:** TWRF/9:00-10:00, or by appointment as required

**Teaching Assistant:** Greg Rixon  
**Office:** Higgins Labs Room 045 (Hydrodynamics Laboratory)  
**Contact Info:** e-address: [gregrixn@wpi.edu](mailto:gregrixn@wpi.edu), Phone: 831-5191  
**Office Hrs:** TRF/15:00-16:00 Higgins Labs Room 309 or e-mail for appointment

**Texts:**

*Technical Graphics Communication*, 2nd Edition. G. R. Bertoline et al. Irwin Publishing Co., Chicago IL, 1997.

*The Companion for CADKEY 97*. J. G. Cherng. Irwin Publishing Co., Chicago IL, 1998.

**Course Description:** This course introduces the student to the concepts and principles of basic Engineering Graphics through a *hands-on* treatment of engineering graphics design and basic computer graphics. This course intends to make the student *engineering smart* in these areas, therefore, *the course should not be looked upon solely as a software course*. Course work is based on presentation theory supported by comprehensive application and project work. Learning methods include case study analyses, readings from the text, a structured term project, defined and graded homework, and a final written exam.

**Course Objectives:** By the end of the course the student will be able to:

1. Define and explain concepts of Engineering Design Graphics.
2. Think and view designs in 3-dimension
3. Define and accurately produce solutions to varied problems in Engineering Graphics and Analytical Geometry, including orthographic projection, isometric views, section views, auxiliary views, dimensioning, and threaded fasteners.
4. Discuss knowledgeably (in-class) concepts of Solid Modeling and Design.
5. Keep a comprehensive notebook of class notes, homework, and project work performed.

**Class attendance:** As future engineers, it is incumbent upon you to develop a sense of responsibility towards your work. In this regard, class attendance will be up to the individual student. Thus, no formal attendance will be taken. However, all assignments, lecture notes, and handouts are the responsibility of the student. **No special exceptions will be given for those not attending lectures or laboratories.** In addition, the final grade will reflect your class participation.

**Assignments and Grading:** As with learning any new language, the workload for Engineering Graphics can be quite heavy and it is nearly impossible to cram. While it can be fun and exciting, the development of visualization skills and familiarity with the software take considerable time. There is a real learning curve in the use of the tools of the course and you should plan your work accordingly. To motivate you to keep on track, there will be **4-5 unannounced quizzes** throughout the term. To ensure fairness in your evaluation, the lowest quiz score will be dropped.

Additionally, the course includes **homework and laboratory exercises** to support your study and understanding of the course material. Homework is due at the beginning of the next class period after the homework has been assigned. Lab assignments will be due at the beginning of the next lab period. *Solutions will be posted on the ES1310's website.* **Late work will not be accepted.**

Evaluation in this course will be via a *final written exam* and a *structured group project* designed to allow you to demonstrate mastery of the subject. These evaluations will cover work specified in the assigned readings, homework, labs, and in-class presentations. **No make-up exams will be given and no late projects will be accepted.**

The numerical cut-off for A, B, and C grades will be determined at the end of the course after all work for the course has been evaluated.

The following will be used as a guide for course evaluation:

Quizzes	20%
Homework and Labs	25%
Project:	30%
Final Exam:	25%

Note: **Both** the final exam and project **must** be completed in order to pass the course.

**Required Tools:**

1. Graph Paper (quad-ruled and isometric)  
Scales (Engineer in English and metric)  
30-60 and 45° Triangles  
Protractor  
Compass
2. 3.5" floppy disk
3. Novell account in the WPI's computer system

**ES 1310 – Engineering Design Graphics  
Course Outline. Term B '99**

<u>Date</u>	<u>Subject</u>	<u>Reading</u>
10/28 R	L#1 Introduction, MR and MC tests	Chapters 1, 2
10/29 F	L#2 Sketching and Intro/Projection theory	Chapter 4
11/01 M	<b>LAB #1</b> A CAD environment: <i>CADKEY</i>	CADKEY Companion: Chapters 1-3
11/02 T	L#3 Projection theory and visualization	Chapters 4,5
11/04 R	L#4 Spatial geometry	Chapters 6,7
11/05 F	L#5 Multiviews. Part I	Chapter 8
11/08 M	<b>LAB #2</b> Multiviews	CADKEY Companion: Chapters 4-6
11/09 T	L#6 Multiviews. Part II	Chapter 8
11/11 R	L#7 Scaling	Chapters 3
11/12 F	L#8 Axonometric drawings	Chapter 9 and 10
11/15 M	<b>LAB #3</b> Isometric views	<i>Team design: project proposal due</i>
11/16 T	L#9 Auxiliary views.	Chapter 11
11/18 R	L#10 Sections. Part I	Chapter 14
11/19 F	L#11 Sections. Part II	Chapter 14
11/22 M	<b>LAB #4</b> Auxiliary and section views	CADKEY Companion: Chapters 7, 9
11/23 T	L#12 Dimensioning. Part I	Chapter 15
11/24 W -11/26 F	Thanksgiving break – No classes	
11/29	<b>LAB #5</b> Dimensioning	CADKEY Companion: Chapter 10
		<i>Team design: project progress due for review</i>
11/30	L#13 Dimensioning. Part II	Chapter 15
12/02	L#14 Tolerancing. Part I	Chapters 15, 16
12/03	L#15 Tolerancing. Part II, Threads. Part I	Chapter 16, 17
12/06	<b>LAB #6</b> Tolerancing and threads	CADKEY Companion: Chapters 10, 12
12/07	L#16 Threads. Part II	Chapter 17
12/09	L#17 Working drawings	Chapter 19
12/10	L#18 Solid modeling	Chapter 7
12/13	<b>LAB #7 Team design project work</b>	
12/14	L#19 Application: analysis and simulation	
12/16	Review, MR and MC tests	
12/17	Final exam.	<i>Team design: final project due at noon</i>