Course Title: Machine Drafting & Design

Course Number: Design Drafter Technology 212

Course Credit: 3 Semester Hours

Prerequisites: IT 111- Engineering Drafting
(suggested IT 242 – Materials & Processes and IT 351 – Machine Tool Technology)

Class Meeting Time & Location: Tuesday & Thursday 8:00 - 9:50, Room 220 Anzalone Hall

Description: Advanced study and applications of detailed and assembly drawings of machines, including precision dimensioning and tolerancing; specifications and symbols; notes, call-outs, material lists, treatments and finishes according to industry-based standards.

A mechanical design course that includes part modeling, assembly, drawing generation, presentation, and sheet metal modeling. The students will also be introduced to the concept of transferring data to and from different electronic media. The students will use AutoDesk Inventor software in this course.

Texts:
Purchase from Union Bookstore:
Autodesk Inventor 11 for Designers by Sham Tickoo and Deepak Maini, CADCIM Technologies

Textbook Rental:

Class Decorum:
Free discussion, inquiry and expression is encouraged in this class. The experiences of all students can be beneficial if they can be intertwined within the course content. However, classroom behavior that interferes with either a) the instructor’s ability to conduct the class or b) the ability of students to benefit from the instruction will not be tolerated. Turn off pagers and cell phones, unless needed for an emergency call (then set to vibrate mode).
**Course Objectives:**
1. Prepare machine working drawings following industry standards and current practices.
2. Recognize, interpret, and draw basic machine drafting problems, while visualizing the solution to the problem.
3. Discuss and apply the principles of the design process as related to machine design.
4. Instill an attitude for neatness, orderliness, accuracy, speed and legibility in one’s work.
5. Use the information learned to solve real (or simulated) machine design drafting problems.
6. Work individually, collectively and in teams to solve technical problems.
7. Describe the various ways that current technology is impacting machine design and drafting.
8. Understand the concepts of part modeling using Autodesk Inventor software.
9. Assemble the components created in the part mode by placing them in the assembly mode.
10. Generate the drawing views of the components and assemblies in the drawing mode.
11. Create the presentation views and animate the assemblies.
12. Create the sheet metal components in the sheet metal mode.

**Course Requirements:** The student should:
1. read assigned sections in the text and be prepared for class.
2. attend class, arrive on time and sit in designated seat.
3. devote necessary time to complete assigned drawings and work by due date.
4. complete all work in a professional manner.
5. maintain a drawing portfolio, and bring it to class.
6. be prepared for unannounced quizzes.
7. adequately study for tests and the final exam.
8. become involved in the class and participate in discussions.
9. provide required drafting equipment.

**Attendance Policy:**
“... all students are expected to attend regularly and punctually all classes in which they are enrolled. Failure to do so may jeopardize a student’s scholastic standing and may lead to suspension from the university... A student doesn’t withdraw from class by failing to attend” (pg. 59 of the 2007-2008 catalog)

YOU are responsible for dropping this class, you will not be dropped automatically!
This is an interactive class, much of the material presented will be drawn from a variety of current sources therefore, therefore your presence for the entire class is essential.

**Evaluation & Assessment:**
The final letter-grade you receive in this course is my verification or assessment of the degree of functional mastery you have achieved.

**Your Job**
Demonstrate (to me) that you have a functional mastery of the facts and concepts of this course by actively participating in class discussions and activities; asking and answering questions asked of you; being prepared for class; completing all assignments on time in a professional manner; studying for and doing well on all quizzes, tests and assignments.

**My Job**
To provide you opportunities to demonstrate your functional mastery of the facts and concepts contained in this course, and based on your performance, assess your level of mastery.

It is my responsibility to: organize and present the material in ways that effectively communicate the facts and concepts, answer your questions (in and out of class), be available to clarify points of confusion and to challenge you, so you can stretch you limits of learning.
A - Demonstrated mastery of all the course concepts and info
B - Demonstrate mastery of most of the concepts and info.
C - Demonstrated minimal mastery
D - Demonstrated somewhat unacceptable level of mastery
F - Completely failed to demonstrate a grasp of the main course concepts and information.

Grading:

- Project: 10%
- Lab drawing assignments: 20%
- Tests: 40% (4-5 major tests of equal value)
- Final Exam: 10% (Comprehensive)
- Weekly Assignments: 10% (Case studies, Internet assignments, etc.)
- Quizzes, participation & attendance: 10% (Unannounced & the number varies)

100%

Departmental Grading Scale:

- 93% - 100% = A
- 85% - 92.9% = B
- 76% - 84.9% = C
- 69% - 75.9% = D
- Below 69% = F

Policy on Make-Up Work:

A student with an unexcused absence may not make up work missed. A grade of zero will be recorded for work missed during the absence. A student with an excused absence has one week after returning to class to make up work missed to earn the full credit.

Important Dates:

- August 20: First day of class
- September 1: Labor Day Holiday
- October 2-3: Fall Break
- October 24: Last day to withdraw or resign
- November 3-14: Advising for Priority Registration
- November 17-21: Priority Registration - Spring 2009
- November 18-22: NAIT Conference
- November 26-28: Thanksgiving Holiday
- December 5: Last Day of class
Course Outline:

Review of previous courses
Chapter 6 - Theory of Shape Description
Chapter 7 - Auxilliary Views and Revolutions
Chapter 9 - Sections
Chapter 8 - Basic Dimensioning

Standards – ISO, ANSI, SAE, ASME, ASTM
  Similarities, differences, purpose

Patents
  Purpose, duration, process, drawings
  Alternatives to patents

Fasteners, Materials, and Forming Processes
Chapter 10 - Threaded Fasteners
Chapter 11 - Miscellaneous Types of Fasteners
Chapter 12 - Manufacturing Materials
Chapter 13 - Forming Processes

Working Drawings and Design
Chapter 14 - Detail and Assembly Drawings
Chapter 15 - Pictorial Drawings
Chapter 16 - Geometric Dimensioning and Tolerancing
Chapter 17 - Drawings for Numerical Control
Chapter 18 - Welding Drawings
Chapter 19 - Design Concepts

Power Transmissions
Chapter 20 - Belts, Chains, and Gears
Chapter 21 - Couplings, Bearings, and Seals
Chapter 22 - Cams, Linkages, and Actuators

Using AutoDesk Inventor
Chapter 1: Drawing Sketches for Solid Models
Chapter 2: Adding Constraints and Dimensions to Sketches
Chapter 3: Editing, Extruding, and Revolving Sketches
Chapter 4: Other Sketching and Modeling Options
Chapter 5: Advanced Modeling Tools-I
Chapter 6: Editing Features and Adding Automatic Dimensions to Sketches
Chapter 7: Advanced Modeling Tools-II
Chapter 8: Assembly Modeling-I
Chapter 9: Assembly Modeling-I
Chapter 10: Working with Drawing Views-I
Chapter 11: Working with Drawing Views-II
Chapter 12: Presentation Module
Chapter 13: Working with Special Design Tools
Chapter 14: Working with Sheet Metal Components
Chapter 15: Introduction to Weldments