COURSE SYLLABUS
IME 3480 - DESIGNING FOR PRODUCTION – Fall 2010

Catalog Description: Engineering documentation as it relates to the product development and manufacturing methods required to bring a quality product to market. ANSI and ISO standards will be studied to acquaint the students with the documentation necessary to develop assembly and part drawings and to control the changes that will affect the assembled parts. Material specifications and cost studies will be combined with geometric dimensioning and tolerancing to be applied to parts gages and tooling. The use of CAD is a major part of this course.

Prerequisites by Topic:

1. A basic understanding of drawing principles (IME1420).
2. A basic understanding of machining processes (IME1540 or 2540).
3. Familiarity with modern CAD systems (IME2460).
4. A basic understanding of how loads, reactions, and resulting stresses affect a structure (IME2810).

Texts: Required -
Machinery's Handbook , The Industrial Press
Fundamentals of Geometric Dimensioning and Tolerancing, Krulikowski

Suggested References -
Ryerson Stock List, Joseph T. Ryerson & Son, Inc.
Designing With Plastics, Hoechst Celanese Corp.

Course Coordinator:

Dr. M. J. Keil, Parkview Campus, Room F-221, Phone: 276-3365,
mitchel.keil@wmich.edu Office hours: 12:30-1:30 Monday, Wednesday or by appointment.

Objectives: (Letters in parentheses refer to TAC of ABET 2001 criteria)
Students should:

1. Learn and apply Geometric Dimensioning and Tolerancing (GD&T) standards to communicate design intent. (a,b,d,f)
2. Learn how the knowledge of certain processes can affect part design and documentation. (a,b,d,f)
3. Learn how strength and stiffness affect the function of a part. (a,b,d,f)
4. Understand how dimensional variation can affect a design. (a,b,d,f)
5. Gain added insight on working in a team design environment. (a,b,d,e,f,g)

Topics: (projected)
Lecture

- Introduction, Chapter 1 Drawings and tolerancing 9-8
- Chapter 2 Symbols and terms 9-13, 9-15
- Chapter 3 Rules and concepts 9-20, 9-22
- Chapter 4 Form Controls 9-27
- Chapter 5 Planar Datums 9-29
- Chapter 6 Axis and centerline datums 10-4
- Chapter 7 Orientation Controls 10-6
- Chapter 8 and 9 Tolerance position, Part 1 and 2 9-11, 10-13
- Chapter 10 Concentricity and symmetry 10-18
- Chapter 11 Runout 10-20
- Chapter 12 Profile 10-25
- midterm (closed book, 1 page of notes) 10-27
- Reverse engineering concepts 11-1
- Metal bending and flat pattern length development 11-3,
- Metal stamping and punch force centers (1 week) 11-8, 11-10
- Dimensioning cast metal parts 11-15, 11-17
- Beam design considerations 11-22, 11-29
- Plastics in design 12-1, 12-6
- Engineering change orders, and review 12-8
- Final, Wednesday Dec 15 2:45 - 4:45 pm

Topics: (continued)

Laboratory

- GD&T problems (4 weeks)
- Reverse engineering (2 weeks)
- Sheetmetal exercise (1 week)
- ADAMS tutorial and exercise (1 week)
- Team project (6 weeks)

Homework and Quiz Policy:

There will be no late homework or quizzes. They will be either on time or excused. Excused work will simply be omitted from the calculation of the homework grade. Unexcused work will be given a grade of zero.

Evaluation:

1.	Homework & Quizzes	10%
2.	Projects	40%
3.	Midterm exams	25%
4.	Final exam	25%

A 93-100, BA 89-92, B 81-88, CB 77-80, C 70-76, DC 67-69, D 60-66, E below 60

Performance Criteria: (Numbers in brackets are the evaluation methods listed in previous section)

The student should demonstrate proficiency in the following areas:

- GD&T principles [1,2,3,4]
- Dimensional variation and it's impact on design [1,2,3,4]
- Sheetmetal design [1,2,3,4]
- The influence of strength and stress [1,2,3,4]
- Material selection [1,2,3,4]

Computer Usage:

Computers will be used extensively throughout the course for geometric modeling, variational analysis, and motion simulation.

Laboratory Projects:

A final project will involve the design of a system, a variational analysis, and study of structural effects.

Oral and Written Communications:

Written reports are required for all laboratory exercises. The reports are expected to be in clear English with proper punctuation. A ten-minute oral presentation, given by the team, is required for the final project.

Academic Integrity:

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate (pp. 271-272) [Graduate (pp. 24-26)] Catalog that pertain to Academic Integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with me if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.