San José State University
School of Engineering/Mechanical Engineering

ME 136, Design for Manufacturability, Spring 2019

Course and Contact Information

Instructor:	Ed Cydzik
Office Location:	Part-time faculty office – E348
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Email:	edward.cydzik@sjsu.edu
Office Hours:	MW 6:30 PM – 7:15 PM
Class Days/Time:	MW 7:30 PM – 8:45 PM
Classroom:	E303
Prerequisites:	ME 110, ME 154

Course Format:

This will be primarily an in-person class. The Canvas Learning Management System (LMS) may be used to augment class material dissemination. All materials handed out or posted in Canvas LMS will be restricted for students use for class purposes.

Course Description (Required)

Principles and practice of Design for Manufacturability and Assembly, with a focus on the product development process; customer requirements, design requirements, robust design, manufacturability, assembly, and environment.

Students will be expected to work in small teams, apply methods they've learned, and present results and conclusions based on assigned work to practice being part of a project team.

Course Goals (Optional)

- Preparation for the work environment by applying product development and design for manufacturability and assembly methods to some basic products.
- Understand the product development processes practiced by different organizations.
- Learn how to capture customer requirements and translate them into design requirements.
- Understand principles of robust design.
- Gain exposure to principles of the Lean Six Sigma methodology.

Upon successful completion of this course, students will be able to:

- Explain how to apply a QFD chart
- Explain how to use a Pugh Concept Selection chart
- Explain how to use an FMEA chart to prioritize activities

Required Texts/Readings (Required)

Textbook

George E. Dieter, Linda C. Schmidt, *Engineering Design 5th Edition*, ISBN 978-0-07-339814-3, available at the Campus Bookstore.

Other Readings

Additional readings will be handed out during lectures and may be posted on the Canvas LMS. All materials handed out or posted in Canvas LMS will be restricted for students use for class purposes.

Other suggested references:

1) Boothroyd, Dewhurst, and Knight (2011), *Product Design for Manufacture and Assembly*, 3rd Edition, ISBN 978-1-4200-8927-1. Outstanding reference on DFM&A, available at the MLK Library.
2) James D. Meadows (2009), *Geometric Dimensioning and Tolerancing , Applications, Analysis & Measurement [per ASME Y14.5-2009]*, ISBN 978-0-9714401-6-6, ASME Press. Excellent reference on GD&T and Tolerance Analysis, available at the MLK Library in electronic format.
3) Preston G. Smith and Donald G. Reinertsen (1991), *Developing Products in Half the Time*, ISBN 0-442-00243-2.
4) Steven C. Wheelwright and Kim B. Clark, *Revolutionizing Product Development*, ISBN 0-02-905515-6.
5) Don Clausing,*Total Quality Development*, ISBN-0-7918-0035-0.
6) Kevin Otto and Kristin Wood, *Product Design*, ISBN 0-13-021271-7.

Other technology requirements / equipment / material

Students may need to have access to SolidWorks® or Creo to create conceptual designs and assemblies

Final Examination or Evaluation

Final exam: One hour final exam on Thursday May 17th from 7:30 PM- 8:30 PM in E329, open book and open notes. A single page of notes is strongly recommended.

Grading Information (Required)

Homework: Seven homework or project assignments, due at the start of lecture in hard copy format on Wednesday following the week assigned. No late homework accepted.

Project: Team activities and presentations.

Exams: One, 1-hour midterm and one, 1- hour final exam.

Grading:		
	Homework	25% of total grade
	Midterm	30% of total grade
	Team activities and presentations	15% of total grade
	Final	30% of total grade

Grading scale:			
	A	=	93.0 – 100
	A-	=	90.0 – 92.9
	B+	=	87.0 – 89.9
	B	=	83.0 - 86.9
	B-	=	80.0-82.9
	C+	=	77.0-79.9
	C	=	73.0-76.9
	C-	=	70.0-72.9
	D+	=	67.0-69.9
	D	=	63.0-66.9
	D-	=	60.0-62.9
	F	=	0 - 59.9

"This course must be passed with a C or better as an SJSU graduation requirement."

Classroom Protocol

This class will require active student participation with frequent stand-up presentations to mimic a typical work environment. Please let the professor know in advance (excused absence) if you will not be able to attend.

Tests, homework, and project work missed because of an unexcused absence receive a grade of 0. No exceptions.

Students are expected to uphold the Student Code of Conduct, Academic Honor Code published in the University Bulleting and/or Student Handbook.

Students caught cheating on an exam or quiz will receive an "F" for the class and the incident will be reported to the department chair for possible further action.

ME 136 / Design for Manufacturability, Spring 2019, Course Schedule

The Course Schedule may change – changes will be announced during lecture time

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	1/28/19	Introduction to the Product Development Process; team-based approach; Reading – Chapter 1 – Engineering Design
	1/30/19	
2	2/4/19	Product Definition and Value Engineering; Reading – Chapter 2
	2/6/19	
3	2/11/19	Quality Management in Manufacturing and Design; Reading – Chapter 3
	2/13/19	
4	2/18/19	Voice of the Customer and Quality Function Deployment; Reading – Chapter 4
	2/20/19	
5	2/25/19	Assembly analysis and manufacturing processes
	2/27/19	
6	3/4/19	Design for variety and platform design
	3/6/19	
7	3/11/19	Midterm – classroom
	3/13/19	
8	3/18/19	Concept Generation and Selection
	3/20/19	
9	3/25/19	Robust Design and Reliability
	3/27/19	
	4/1/19	**Spring Recess**
	4/3/19	
10	4/8/19	Design for Service, Design for the Environment, DFx
	4/10/19	
11	4/15/19	Six Sigma and Error Proofing
	4/17/19	
12	4/22/19	Cost Analysis and Scorecarding
	4/24/19	
13	4/29/19	Advanced Application of DFM tools
	5/1/19	

Week	Date	Topics, Readings, Assignments, Deadlines
14	5/6/19	Review for Final
	5/8/19	Final Exam – 5/8/19 – 7:30 – 8:45 PM in our classroom