

DESIGN FOR MANUFACTURE
ME 750S Three Credit Hours
SECTION 23684 EVE
FALL 2001

Instructor: Dr. Jilun Sha
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Text: Geoffrey Boothroyd, Peter Dewhurst, and Winston Knight,
PRODUCT DESIGN FOR MANUFACTURE AND ASSEMBLY,
MARCEL DEKKER Inc, 1994

Reference:

- 1) Handbook of Product Design for Manufacturing
James G. Bralla –Editor in Chief
McGraw-Hill Book Company, 1986
ISBN 0070071306
- 2) Design for Manufacturability Handbook
James G. Bralla –Editor
Second Edition
McGraw-Hill Book Company, 1998
ISBN 007007139-X
- 3) Design for Excellence
James G. Bralla
McGraw-Hill Book Company, 1995
ISBN 0070071381
- 4) Design for Manufacture- Strategies, Principles and Techniques
John Corbett, Mike Dooner, John Meleka and Christophor Pym
Addison-Westley Publishers Ltd., 1991
- 5) Assembly Automation and Product Design
Geoffrey Boothroyd
Marcel Dekker Inc., 1991
- 6) Improving Maintainability and Reliability Through Design
Graham hompson
ISBN 1-86058-135-8

ASME Press

7) Controlling Design Variants: Modular Product Platforms

Anna Ericsson and Gunnar Erixon

ISBN 0-7918-0150-0

ASME Press

8) Quality, Reliability and Maintenance

GJ McNulty

ISBN 1-86058-256-7

ASME Press

9) Advances in Vehicle Design

John Fenton

ISBN 1-86058-181-1

ASME Press

Contents: The course covers the philosophy behind the concepts of the Design for Manufacture (DFM), the history of the DFM development, examples of the applications in assembly, machining, sheet metalworking, die casting, and etc.

DFM aims at highlighting costly-to-manufacture features in a part at the early design stages. This brings down stream concerns up front and helps avoid costly redesign interactions at the manufacturing stage. Using DFM tools by making trade-offs between functionality and manufacturability concerns. Therefore, DFM, to many people, means Design for Manufacturability.

Although, this course focuses on the concepts not the details, certain individual manufacturing processes will be discussed in details to assist the understanding of the philosophy.

The text book chosen serves as the main guideline for the course. However, the course is not limited itself by the contents of the book. Papers of the different authors will also used in the classroom or homework.

GRADING

The final grade is based on 100 points computed approximately as follows:

~10 Homework	~3 each	30 points
~2 Quizzes	~5 each	10 points
~1 Middle Term		10 point
~1 Project		30 points
~1 Final		20 points

QUIZZES

2 or more announced (and unannounced) quizzes, in lecture.

POLICIES

Homework and Exams

No late homework will be accepted.

Mid-term and final exams are on lecture materials. (They could be written or oral or both)

All examinations are of the closed book/notes type unless otherwise stated, and no make-up tests will be given.

Group Project

All assignments are individual tasks and have to be completed by the individual except the term project. Groups of two to three could be formed for the term project in the case that the work-load is large. Permission from professor is required. Then the term project will be graded on a group basis.

Regrade

If you have a question regarding any graded test, homework or quiz, write a brief explanation, attach it to the front of the item, and submit it to the instructor in lecture. Regrade requests will be accepted only within one week after the item was returned to you.

Attendance

All students are expected to attend all sessions of this course. Absence will not excuse students from required assignments. Classroom discussion is an integral part of this course and is essential to the successful completion of this course.

Final Grades

The final grade will be based on the student's performance relative to the class average.

TENTATIVE COURSE OUTLINE

Introduction to the course
Introduction to DFM
History of DFM
Machining Basics
Tooling, Machining setups and sequences
DFM for machining
DFM for Automobile Assembly
Sheet Metal Assembly
(Body Shop Robots)
Sheet Metal Assembly
(Body Shop dimension Control)
DFM for Sheet Metalworking
Stamping ABC
DFM for Sheet Metalworking
Quick Die Change and JIT
Transfer press and pre-welded blanks
Selection of Materials and Processes
Product Design for Manual Assembly
Design for Injection Molding
Design for Powder Metal Processing
Design for Electrical Connections and Wire Harness Assembly
DFM and fasteners

(The order will be rearranged later according to the needs)