

COURSE NUMBER: ME 3221, 4 credits	COURSE TITLE: Design and Manufacturing I
TERMS OFFERED: Fall, Spring, Summer	PREREQUISITES:
TEXTBOOKS/REQUIRED MATERIAL: Jvinall & Marshak, Fundamentals of Machine Component Design, Wiley. Kalpakjian, Serope, and Schmid, Manufacturing Processes For Engineering Materials, Prentice Hall.	PREPARED BY: Professors S. Mantell, W. Durfee B. Klamecki DATE OF PREPARATION: May, 2007
COURSE LEADER(S): Professors S. Mantell, T. Chase, B. Klamecki	CLASS/LABORATORY SCHEDULE: Three 50 minute lectures and one 120 minute lab per week CONTRIBUTION OF COURSE TO MEETING PROFESSIONAL OBJECTIVES: 100 % Engineering Topics
CATALOG DESCRIPTION: Material behavior and failure in design and manufacturing. Models of manufacturing processes, material removal, bulk deformation, sheet metal forming, and consolidation processes. Statistical characterization of process capabilities and parts.	COURSE TOPICS: 1. Review of deformable body mechanics (loading, stress, strain, bending) 2. Failure theories (static, fatigue) 3. Manufacturing processes (machining, forming molding, welding) 4. Quality assurance (design of experiments, statistical process control)

COURSE OBJECTIVES	<ol style="list-style-type: none"> 1. Teach basics of failure theory 2. Teach basics of manufacturing processes 3. Provide practical experience through a series of hands-on laboratory experiments
--------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>COURSE OUTCOMES</p>	<p>(Letters shown in brackets are linked to program outcomes a-k)</p> <ol style="list-style-type: none"> 1. Students learn to design manufacturing processes, components that are part of multi-component systems and mechanical engineering systems. [a, k] 2. Students learn to select and size mechanical components so that their designs will not fail [a, k] 3. Students learn basic manufacturing processes and are able to specify appropriate processes for engineered products [a, i, k] 4. Students gain experience with computer controlled machine tools such as programming and running a NC lathe. [c, k] 5. Students learn to test material properties and strength of manufactured parts.[k] 6. Students understand through observation and participation the basics of NC machining, mold simulations, injection molding, casting and welding [k] 7. Students document their work in lab reports [g]
<p>ASSESSMENT TOOLS:</p>	<ol style="list-style-type: none"> 1. Homework 2. Lab reports 3. Final exam

ME 3221

Nature of Changes:

1. *Course outcome #1, 2, became outcomes 2 and 3 respectively.*
2. *Course outcomes 5 and 6 became outcomes 6 and 7, respectively.*
3. *The current course outcomes 1, 4, and 5 were added to the document.*