Course Outcomes [Related ME Program Outcomes in brackets]

1. Provide a fundamental knowledge of the principles and theories of manufacturing processes. [1,2,3,7]
2. Gain knowledge of the practice of measurements and manufacturing processes through laboratory experiments. [1,2,4,5,6]
3. Sharpen skills in problem formulation and integration of a broad range of technical capabilities through certain open-ended experimental designs. [1,2,3,4,7]
4. Sharpen technical communication skills through short technical lab reports. [3,4]

Laboratory Experiments

1. Basic Measurement Principles and Practice (Dimension, Tolerance, Surface Roughness, hardness and Geometry)
2. Basic Operation of Machine Tools (Lathe and Milling Machine)
3. Data Analysis Using Statistics (Histogram, Regression Analysis)
4. CNC programming and CNC machining
5. Microfabrication using soft lithography
6. 3D printing
7. Simulation of metal forming processes
**COURSE NUMBER:** ME 363  
**COURSE TITLE:** Principles and Practices of Manufacturing Processes

<table>
<thead>
<tr>
<th>REQUIRED COURSE OR ELECTIVE COURSE:</th>
<th>Elective</th>
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<tr>
<td>COORDINATING FACULTY:</td>
<td>Y.C. Shin</td>
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| ASSESSMENTS TOOLS: | 1. Some independent projects and Homework.  
2. Mid-semester exams.  
3. Formal lab reports.  
4. Final exam. |
| PROFESSIONAL COMPONENT: | 1. Engineering Topics: Engineering Science – 2 credits (66.7%)  
Engineering Design – 1 credit (33.3%) |
| NATURE OF DESIGN CONTENT: | It is required to select processes and design process conditions. Students also design parts and select pertinent process variables in order to complete the laboratory projects. Students also conduct web-based simulation projects to design suitable process conditions. |
| Laboratory Projects: | 1. Measurements of material dimensional and surface properties using various gages and instruments (2 weeks)  
2. Various machining experiments to study the basic operating principles of machining processes. (3 weeks)  
3. Manufacturing automation by computer numerical control. (3 weeks)  
4. Microfabrication (2 weeks)  
5. Composite processing by freeform fabrication processes. (2 weeks) |
| COMPUTER USAGE: | Moderate |
| COURSE STRUCTURE/SCHEDULE: | 1. Lecture 2 days per week at 50 minutes  
2. Laboratory 1 day per week at 160 minutes. |
| PREPARED BY: | Y.C. Shin |
| REVISION DATE: | February 21, 2019 |

**TERMS OFFERED:** Fall

**PRE-REQUISITES:** ME 263 Introduction to Mechanical Engineering Design, Innovation and Entrepreneurship

**COURSE OUTCOMES** [Related ME Program Outcomes in brackets]:
1. Provide a fundamental knowledge of the *principles and theories of manufacturing processes*. [1,2,3,7]
2. Gain knowledge of the practice of *measurements and manufacturing processes* through laboratory experiments. [1,2,4,5,6]
3. Sharpen skills in *problem formulation and integration* of a broad range of technical capabilities through certain open-ended experimental designs. [1,2,3,4,7]
4. Sharpen *technical communication skills* through short technical lab reports. [3,4]

**RELATED ME PROGRAM OUTCOMES:**
1. Engineering fundamentals  
2. Engineering design  
3. Communication skills  
4. Ethical/Prof. responsibilities  
5. Teamwork skills  
6. Experimental skills  
7. Knowledge acquisition