

# IND 113

## Materials & Processes in Manufacturing

### COURSE OUTLINE

#### Prerequisites:

There are no prerequisites for this course

#### Course Description:

Studies materials and processes for the manufacture of products. Investigates the nature of various materials. Examines the manufacturing processes of industry and their effects on materials. This class will provide the background information necessary to understand why some materials are better than others. The content is for individuals who need to understand materials, their properties, and how manufacturing changes these properties. Content addresses the many varieties of materials and their uses. An emphasis is placed on metals. Lecture 3 hours per week. **3 credits**

**Semester Credits: 3      Lecture Hours: 9:00 - 9:50 a.m.**

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### Course Outcomes

**At the completion of this course, the student should be able to:**

- Understand the fundamentals of manufacturing and manufacturing processes
- Understand scales of material structure and product shapes
- Understand the physical limitations of the materials we are studying
- Understand manufacturing processes such as Casting, Forming, Cutting, and Joining
- Know the important aspects of how each material is used
- Describe the characteristics of crystalline and non-crystalline materials
- Describe general behavior of metals, ceramics and plastics
- Specify and interpret results of basic materials tests
- Identify strengths and limitations of basic manufacturing processes
- Recommend appropriate manufacturing processes based on material, desired attributes and cost

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### Required Materials:

**Tooling U 120 Day Subscription** Edition: N/A

**Author:** Tooling U

**Copyright Year:** NA

**Publisher:** TOOLING UNIVERSITY

**Availability:** VWCC Bookstore or on-line via [www.toolingu.com](http://www.toolingu.com)

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### **Tentative Course Topics & Discussion Week:**

<b><u>Week</u></b>	<b><u>Topic</u></b>
1	<b>Introduction to Materials</b>
2, 3	<b>Material Classification and Properties, Quiz</b>
4	<b>Mechanical Properties of Metal</b>
5	<b>Metal Manufacturing</b>
6	<b>Metal Classification</b>
7, 8	<b>Ferrous Metals and Alloys, Quiz</b>
9, 10	<b>Plastic Properties &amp; Processes, Quiz</b>
11, 12	<b>Nonferrous Metals, Ceramics</b>
13	<b>Composites</b>
14	<b>More Ceramics</b>
15	<b>Review</b>
16	<b>Final Exam</b>