SYLLABUS
PART I
EDISON COMMUNITY COLLEGE
MFG 120S MATERIALS TECHNOLOGY
3 CREDIT HOURS

COURSE DESCRIPTION
The properties of engineering materials. Mechanical and physical properties, testing, and heat treatment of metals are covered. Structures and properties of polymers, ceramics, and composite materials are also covered. Basic principles of chemistry are introduced as required for understanding. Lab fee.

COURSE GOALS
The student will:

Bloom's Level		Program Outcomes
1	1. Identify the major categories of engineering materials and their applications.	4
1	2. Describe the basic mechanical and physical properties of materials and their significance to design and manufacturing.	4
3	3. Conduct tensile, hardness, and other tests of material properties and interpret the results of those tests.	4
3	4. Prepare metallographic specimens for microscopic inspection of material structures.	4
1	5. Describe what alloys are and the significance of the structure of alloys.	4
1	6. Identify the mechanisms involved in heat treatment and how heat treatment is used to vary material properties.	4
3	7. Perform heat treatment on various alloys and investigated the effects of that treatment on material properties.	4
3	8. Classify the production, characteristics, and application of steels and stainless steels.	4
1	9. Describe the characteristics and applications of non-ferrous alloys.	4
1	10. Identify the general categories of polymer materials and their properties.	4
1	11. Identify polymers given design requirements such as mechanical and physical properties and operating environment.	4
1	12. Describe the structure, properties, and applications of ceramics and composite materials.	4
3	13. Classify the concepts of various types of non-destructive testing including dye-penetrant, magnetic particle, radiographic, ultrasonic, and eddy current.	4
3	14. Perform dye-penetrant and magnetic particle inspection.	4

CORE VALUES
The Core Values are a set of principles, which guide in creating educational programs and environments at Edison. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

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TOPIC OUTLINE

1. Production of metals from ores
2. Manufacture of Steels
3. Identification of Ferrous and Non-Ferrous Metals
4. Mechanical properties of materials
5. Testing of mechanical properties
6. Physical properties of materials
7. Metal Structures
8. Metal Alloys
9. Heat treatment and hardenability of ferrous and non-ferrous metals
10. Steel and stainless steel properties and processing
11. Non-ferrous materials
12. Non-destructive testing
13. Polymers
14. Ceramics
15. Composite materials