

DRFT-112-MATERIALS AND PROCESSES 3 CREDITS

SYLLABUS

CATALOG DESCRIPTION

This introductory course in materials science will give the student a basic knowledge of industrially significant materials and commonly employed processing and manufacturing methods.

Prerequisites: None

Semester Offered: Spring

Common Student Learning Outcomes

Upon successful completion of San Juan College programs and degrees, the student will demonstrate competency in...

BROAD AND SPECIALIZED LEARNING

Students will actively and independently acquire, apply, and adapt skills and knowledge with an awareness of global contexts.

CRITICAL THINKING

Students will think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.

CULTURAL AND CIVIC ENGAGEMENT

Students will act purposefully, reflectively, and ethically in diverse and complex environments.

EFFECTIVE COMMUNICATION

Students will exchange ideas and information with clarity in multiple contexts.

INFORMATION LITERACY

Students will be able to recognize when information is needed and have the ability to locate, evaluate, and use it effectively.

INTEGRATING TECHNOLOGIES

Students will demonstrate fluency in the application and use of technologies in multiple contexts.

Student work from this class may be randomly selected and used anonymously for assessment of course, program, and/or institutional learning outcomes. For more information, please refer to the Dean of the appropriate School.

Course Learning Outcomes

Upon successful completion of the course, the student will be able to...

1. Understand the structure and composition of metallic materials and how their properties are affected by these parameters.
2. Learn how properties of ferrous metals are affected by thermal treatment.

3. Understand the structure and composition of non-metallic materials and how their properties are affected by these parameters.
4. Examine the commonly employed industrial methods for processing materials.
5. Study the effects on the environment of materials processing.

Specific Learning Objectives:

Upon successful completion of the course, the student will be able to...

1. Identify the various categories of industrial materials. (B,C,E)
2. Iterate the primary processing methods of organic and inorganic materials. (B,C,I,E)
3. Describe the structure, properties and characteristics of metals and how they respond to heat treatment. (B,C,E)
4. Describe the structure, properties and characteristics of polymeric materials. (B,C,E)
5. Describe the structure, properties and characteristics of ceramic materials. (B,C,E)
6. Describe the structure, properties and characteristics of composites. (B,C,E)
7. Clarify the elements and principles of product design. (B,C,E,I)
8. Explain the preprocessing methods of steel. (B,C,E,I)
9. Elucidate the various molding processes, casting processes and machining processes. (B,C,E,I)
10. Identify common fabrication and material fastening processes. (B,C,E,I)
11. Discuss materials recovery and the ecological/production system. (B,C,E)