

**Course Objectives/Course Outline  
Spokane Community College**

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**Course Title: Materials Science**

**Prefix and Course Number: CAD 254**

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**Course Learning Outcomes:**

**By the end of this course, a student should be able to:**

- understand atomic structure
- identify the applications for various protective finishes
- analyze the characteristics of materials
- have a thorough understanding of heat treating processes

**Course Outline:**

- I. Mining and processing
  - A. Mining ore
  - B. Steel making
  - C. Aluminum
  - D. Other metals
- II. Metallurgical Science
  - A. Properties of metals
  - B. Nondestructive testing
- III. Heat Treatment of Metals
  - A. Iron-Carbon diagram
  - B. Tempering
  - C. Surface hardening
  - D. Softening operations
- IV. Crystalline Structure
  - A. Atomic structure
  - B. Classification of Atoms
  - C. Crystalline structure
  - D. Plastic deformation
  - E. Plastics
- V. Selection and Application
  - A. Classification systems
  - B. Structural steels
  - C. Stainless steels
  - D. Nonferrous metals