PIKES PEAK STATE COLLEGE
Machining Technology

Master Course Syllabus
MAC 2052: Practical Metallurgy

Purpose of Document
This document contains important information about this course's objectives. It may be helpful for you to retain a copy for your records, along with the class specific syllabus. This document will be especially helpful if you decide to later change your course of study.

Pikes Peak State College and the Colorado Department of Higher Education have determined that graduates should have a broad range of learning skills as well as discipline related skills. Both types of skills are detailed below.

Course Description
Offers a study of metallurgical terms and definitions, in an effort to understand both the behavior of metals and their service to industry. Characteristics during heating, cooling, shaping, forming, and the stresses related to their mechanical properties are covered. The theory behind the alloys, heat treatment processes, and the impact they have on strength, toughness, hardness, elasticity, ductility, malleability, wear resistance and fatigue resistances is investigated.
Credit Hours: 3
Contact Hours: 67.5 (Lecture/Lab Combination)

Required Course Learning Outcomes
1. Define and explain key metallurgical terms.
2. Describe the changes in metallurgical characteristics during heating, cooling, shaping, and forming.
3. Explain the effects of stress on metals.
4. Describe heat-treating processes.
5. Explain the functions and purpose of Alloys.

Required Topical Outline
I. Metallurgy
   A. Terms and definitions
II. Metallurgical characteristics
   A. Changes in Characteristics During Heating
   B. Changes in Characteristics During Cooling
   C. Changes in Characteristics During Shaping
   D. Changes in Characteristics During Forming

III. Mechanical properties
    A. Effects of stress
IV. Heat treating
    A. Purpose for heat treating
    B. Heat treating processes
V. Alloys
    A. Purpose of alloys
    B. Effects of alloys on strength
    C. Effects of alloys on toughness
    D. Effects of alloys on hardness
    E. Effects of alloys on elasticity
    F. Effects of alloys on ductility
    G. Effects of alloys on malleability
    H. Effects of alloys on wear resistance