



BAKER COLLEGE
STUDENT LEARNING OUTCOMES

ISE2110 Manufacturing Processes
3 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Summarize manufacturing concepts and functions
 - a. Analyze why manufacturing is important to our national and global economy
 - b. Discuss the impact of manufacturing on environment
 - c. Formulate factors of safety using engineering design strength and material yield strength
2. Evaluate material properties
 - a. Manage typical stress-strain curve for ductile and brittle materials
 - b. Translate the Brinell hardness into the approximate tensile strength
 - c. Calculate stress and strain for tension, compression, and shear
 - d. Classify the differences in strength, ductility, and machine power requirements between hot and cold rolled metals using AISI/SAE system
 - e. Manage the iron-carbon phase diagram
3. Evaluate material processes used in manufacturing
 - a. Manage hardness and tensile tests for metals
 - b. Analyze the major casting processes
 - c. Analyze the effects of cold work and heat treatment processes on strength and ductility
 - d. Formulate MRR (material removal rate) for single point cutting and abrasive processes
 - e. Select a forming process to produce a part when given a sheet metal design
 - f. Assess methods for changing the surface condition of metals including types of wear and lubrication
 - g. Describe methods of softening/hardening/case hardening/ and tempering of steels inclusion use of time-temperature- transformation diagram
 - h. Calculate hole punch force and compressive upsetting force for metal forming
 - i. Evaluate polymer, ceramic and composite processing methods

These SLOs are not approved for experiential credit.

Effective: Spring 2020