

Sheet Metalworking**172. Fluid Metal Processes (3)**

Prerequisite: Ind A 70 or permission of instructor. Theory and practice in processes of industrial casting, casting design considerations, pattern making, core making, sand mold casting, permanent mold casting, die casting, centrifugal casting, and related processes.

173. Metal Fabrication Processes (3)

Sheet metal pattern drafting and layout applicable to parallel, radial, and triangulation methods using light gauge metals; individual problems in planning, using, and maintaining hand and machine tools.

Machine Tool Metalworking**74. Basic Machine Tool Metalworking (3)**

Basic methods of machining metals, including drilling, turning, boring, milling, grinding, and shaping; hand tools, precision measuring instruments, and layout; speeds and feeds; steel and its heat treatment.

174. Advanced Machine Tool Metalworking (3)

Prerequisite: Ind A 74. Advanced machining and tooling, special machine tools, and precision measuring instruments; laboratory experiences in use of ferrous and nonferrous metals, cast iron and semisteel castings; coolants related to modern manufacturing process.

175. Machine Tool Technical Problems (3)

Prerequisite: Ind A 74. Technical problems in design, layout fabrication and machinability of metals, tooling and gearing principles; maintenance, adjustment and repair of machine tools; introduction to numerical control.

176. Advanced Machine Tool Problems (3)

Prerequisite: Ind A 174. Advanced technical work in metals area; introduction to tool and die work; jig and fixture principles and practices; heat treatment, specifications of materials and equipment; experimental work and technical reports.

Metal Craft**178. Jewelry and Metalsmithing (3; max total 6)**

Design, fabrication techniques, and properties of materials as related to jewelry, gemology, and metalsmithing. Historical, contemporary, and creative emphasis. Designing and constructing articles of jewelry and hollow ware by hand and machine processes.

WOODWORKING AREA**80. Basic Woodworking (3)**

Not open to students with credit in Ind A 81. Intended for Industrial Arts and Technology majors pursuing an area of concentration in woodworking or wood industries emphasis. Basic woodworking and finishing process and materials; use and care of hand tools, portable electric tools, light woodworking machinery, basic units in wood technology.

81. General Woodworking (3)

Not open to students with credit in Ind A 80 or Industrial Arts and Technology majors pursuing an area of concentration or emphasis in wood industries. Introduction to woodworking materials and processes oriented to the home craftsman, hobbyist. Emphasis on consumer materials, hand and portable electric tools, consumer finishing materials and processes. Student oriented interests and objectives.

82. Wood Machining (3)

Prerequisite: Ind A 80, 81 or permission of instructor. Development of proficiency in the operation and maintenance of modern woodworking machinery and spray finishing equipment; safety education, cutting principles and techniques, machine design and capabilities.