

# FABRICATION COURSE SUMMARIES

## INTRODUCTORY

### **FAB1010: FABRICATION TOOLS & MATERIALS**

Students develop knowledge and skills in the use of basic hand tools and materials used in fabrication processes, and safely transform common metals into useful products.

*Prerequisite:* None

### **FAB1040: OXYACETYLENE WELDING**

Students develop basic skills in the safe handling and operation of oxyacetylene equipment.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1048: SEMI-AUTOMATED/AUTOMATED WELDING**

Students develop basic knowledge and skills related to the use of Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW) processes in both personal use and commercial applications. They also develop introductory knowledge of Submerged Arc Welding (SAW) processes.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1050: BASIC ELECTRIC WELDING**

Students develop basic skills related to the safe use and operation of one or more common electric welding processes.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1090: SHEET FABRICATION 1**

Students use basic tools, materials and processes to fabricate sheet materials into finished products, models or prototypes.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1100: FABRICATION PRINCIPLES**

Students investigate and apply fundamental principles of fabrication to build an artifact or structure from common structural materials.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1110: BAR & TUBULAR FABRICATION**

Students use cutting, bending and fastening processes to create a variety of products from bar and tubular stock.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1120: FOUNDRY – ONE-PIECE PATTERN**

Students develop the basic skills required to produce a simple one-piece pattern, a sand mould and a finished casting.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1130: PRINCIPLES OF MACHINING**

Students develop basic hand and machine tool knowledge, skills and techniques to mechanically remove materials.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1160: PRODUCTION SYSTEMS**

Students investigate and compare the principles of production operation and the characteristics of a number of production systems.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB1910: FAB PROJECT A**

Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

*Prerequisite:* None

## INTERMEDIATE

### **FAB2010: STRUCTURAL ENGINEERING**

Students investigate the nature of forces and structural materials and apply their findings to design and fabrication activities.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB2020: PRINT READING**

Students develop basic skills in reading and interpreting working drawings to prepare a bill of materials and sequence of operations.

*Prerequisite:* None

### **FAB2030: OXYFUEL WELDING**

Students develop basic skills in the safe and efficient use of oxyfuel equipment and supplies to braze and fusion weld.

*Prerequisite:* FAB1040: Oxyacetylene Welding

### **FAB2040: THERMAL CUTTING**

Students develop basic skills to use, safely and efficiently, thermal cutting equipment and supplies.

*Prerequisite:* FAB1040: Oxyacetylene Welding

### **FAB2048: FLUX CORED ARC WELDING 1**

Students develop an understanding of the advantages and disadvantages of Flux Cored Arc Welding (FCAW) processes, and they gain experience using FCAW processes by performing flat, horizontal and vertical fillet welds and flat groove welds.

*Prerequisite:* FAB1048: Semi-automated/Automated Welding

### **FAB2050: ARC WELDING 1**

Students develop basic knowledge, skills and attitudes related to the operation and use of Shielded Metal Arc Welding (SMAW) equipment and accessories to make a variety of welds in the flat position.

*Prerequisite:* FAB1050: Basic Electric Welding

### **FAB2060: ARC WELDING 2**

Students identify appropriate electrodes by visually assessing a weld and making the necessary adjustments to improve weld quality while developing horizontal position welding skills.

*Prerequisite:* FAB2050: Arc Welding 1

### **FAB2070: GAS METAL ARC WELDING 1**

Students develop an understanding of the advantages and disadvantages of Gas Metal Arc Welding (GMAW) processes, and they gain experience using GMAW processes by performing flat, horizontal and vertical fillet welds and flat groove welds.

*Prerequisite:* FAB1048: Semi-automated/Automated Welding

### **FAB2090: SHEET FABRICATION 2**

Students use basic layout, cutting, bending and fastening operations to transform common types of sheet metals into consumer products.

*Prerequisite:* FAB1090: Sheet Fabrication 1

### **FAB2100: SHEET FABRICATION 3**

Students expand sheet metal skills related to pattern making, seam constructing and edge treating.

*Prerequisite:* FAB2090: Sheet Fabrication 2

### **FAB2110: FORGING FUNDAMENTALS**

Students determine the effects of heating and striking metal to change its shape and internal structure, using forging techniques.

*Prerequisite:* FAB1110: Bar & Tubular Fabrication

### **FAB2120: FOUNDRY – SPLIT PATTERN**

Students expand their pattern making and foundry skills to produce split pattern moulds and finished castings.

*Prerequisite:* FAB1120: Foundry – One-piece Pattern

**FAB2130: PRECISION TURNING 1**

Students develop basic turning skills to size, shape and finish common machineable metals and plastics.

*Prerequisite:* FAB1130: Principles of Machining

**FAB2140: PRECISION MILLING 1**

Students develop basic milling skills to shape and finish common machineable metals and plastics.

*Prerequisite:* FAB1130: Principles of Machining

**FAB2150: CNC TURNING**

Students develop skills in computer-assisted design (CAD) and computer numerical control (CNC) programming to manufacture a product on a CNC lathe.

*Prerequisite:* FAB1130: Principles of Machining

**FAB2160: CUSTOM FABRICATION**

Students work independently, or in a cooperative learning environment, to plan and construct a product/structure that meets a specific client's needs.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

**FAB2170: PIPE FITTING**

Students learn about the uses of pipes, basic piping principles and fabrication skills.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

**FAB2910: FAB PROJECT B**

Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

*Prerequisite:* None

**FAB2920: FAB PROJECT C**

Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

*Prerequisite:* None

**FAB2950: FAB INTERMEDIATE PRACTICUM**

Students apply prior learning and demonstrate the attitudes, skills and knowledge required by an external organization to achieve a credential/credentials or an articulation.

*Prerequisite:* None

## ADVANCED

### **FAB3010: MATERIALS TESTING**

Students are introduced to the principles of materials testing and to the development and evaluation of a mechanical materials test.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB3020: METALLURGY FUNDAMENTALS**

Students develop fundamental understanding and skills related to metallurgy and apply these skills to fabrication processes.

*Prerequisite:* FAB1010: Fabrication Tools & Materials

### **FAB3030: GAS TUNGSTEN ARC WELDING**

Students develop basic knowledge and skills related to the use of Gas Tungsten Arc Welding (GTAW) equipment and supplies to weld mild steel in the flat and horizontal positions.

*Prerequisite:* FAB2030: Oxyfuel Welding

### **FAB3040: SPECIALIZED WELDING**

Students develop specific skills associated with advanced welding techniques to join and repair metals other than low carbon steel.

*Prerequisite:* FAB2030: Oxyfuel Welding

### **FAB3048: FLUX CORED ARC WELDING 2**

Students develop skills to evaluate and improve the quality of Flux Cored Arc Welding (FCAW), and they extend their FCAW skills by performing horizontal and vertical groove welds.

*Prerequisite:* FAB2048: Flux Cored Arc Welding 1

### **FAB3050: ARC WELDING 3**

Students learn the role of codes and standards in the welding trade, as well as test welds and develop vertical position welding skills.

*Prerequisite:* FAB2060: Arc Welding 2

### **FAB3060: ARC WELDING 4**

Students apply and extend positional welding skills by using a variety of common electrodes and thickness of materials.

*Prerequisite:* FAB3050: Arc Welding 3

### **FAB3070: PIPE & TUBULAR WELDING**

Students develop specific skills related to pipe layout, preparation of pipe/tube joints and welding techniques.

*Prerequisite:* FAB3170: Gas Metal Arc Welding 2

### **FAB3080: AUTOMATED WELDING**

Students investigate and describe the operation of various manual, semi-automated and automated welding processes and systems used in fabrication industries.

*Prerequisite:* FAB3170: Gas Metal Arc Welding 2

### **FAB3090: SHEET FABRICATION 4**

Students develop specialized skills in cylindrical and conical pattern development and seam construction of ferrous and non-ferrous sheet metals.

*Prerequisite:* FAB2100: Sheet Fabrication 3

### **FAB3110: SHEET FABRICATION 5**

Students apply and develop specialized skills in duct component pattern making and fabrication techniques.

*Prerequisite:* FAB2100: Sheet Fabrication 3

### **FAB3120: FOUNDRY – CORE MOULDING**

Students investigate and apply advanced foundry processes to produce a hollow casting, using a sand and core mould.

*Prerequisite:* FAB1120: Foundry – One-piece Pattern

**FAB3130: PRECISION TURNING 2**

Students develop specialized lathe skills for thread cutting and taper turning techniques.

*Prerequisite:* FAB2130: Precision Turning 1

**FAB3140: PRECISION MILLING 2**

Students develop specialized skills to use vertical and/or horizontal milling machines.

*Prerequisite:* FAB2140: Precision Milling 1

**FAB3150: CNC MILLING**

Students develop skills in computer numerical control (CNC) programming to manufacture a three-dimensional product.

*Prerequisite:* FAB1130: Principles of Machining

**FAB3160: PREFABRICATION PRINCIPLES**

Students work in a cooperative learning environment to plan and construct a prefabricated product/structure to meet the specific needs of a client.

*Prerequisite:* FAB2160: Custom Fabrication

**FAB3170: GAS METAL ARC WELDING 2**

Students develop skills to evaluate and improve the quality of gas metal arc weldings, and they extend their Gas Metal Arc Welding (GMAW) skills by performing horizontal and vertical groove welds.

*Prerequisite:* FAB2070: Gas Metal Arc Welding 1

**FAB3910: FAB PROJECT D**

Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

*Prerequisite:* None

**FAB3920: FAB PROJECT E**

Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

*Prerequisite:* None

**FAB3950: FAB ADVANCED PRACTICUM**

Students apply prior learning and demonstrate the attitudes, skills and knowledge required by an external organization to achieve a credential/credentials or an articulation.

*Prerequisite:* None