UTAH SYSTEM OF HIGHER EDUCATION

Utah System of Higher Education
Fabrication and Fitting
FY2027 / 21 Credits (630 Clock-Hours)

Foundational Courses

Fabrication and Fitting

TECF 1011 Blueprint Reading/Fabrication Math **3 Credits / 90 Clock-Hours**

Blueprint Reading is designed to help students recognize the components of a blueprint and understand how to fabricate by reading blueprints. Fabrication Math is taught in an interactive format provided by the American Welding Society. It is designed to teach students the mathematical input that is required to properly and efficiently fabricate. This course will cover the algebra and geometry associated with fabrication and provide real-world applications.

Objectives:
• Differentiate between varying types of blueprints and demonstrate how to read each type.
• Display knowledge of blueprints, based on the current units.
• Interact with real blueprint examples and demonstrate how to efficiently read them, and fabricate to the standards of the blueprints, and any associated code.
• Demonstrate efficient and effective methods of completing a build by planning a series of tasks shown on a blueprint.

TECF 1012 Introduction to Cutting and Welding **3 Credits / 90 Clock-Hours**

Introduction to Cutting and Welding is designed to equip students with fundamental skills in operating and utilizing welding equipment, as well as performing advanced cutting processes. The course introduces students to the functions of welding machines and teaches them how to produce structurally sound tack welds. Additionally, students will learn to prepare and fabricate basic weld joints, laying the foundation for more advanced welding techniques.

Objectives:
• Produce adequate oxy-fuel, plasma-arc, and carbon-arc cuts.
• Produce adequate welds with a variety of welding processes.
• Test weld soundness by means of destructive testing according to industry standards.

TECF 1050 Crane Rigging, Safety, and Operation **2 Credits / 60 Clock-Hours**

This course will teach students how to safely operate cranes used to lift and move very heavy or large materials. They will gain hands-on experience and apply the knowledge and mathematical skills involved with operating an overhead crane. They will also learn the hazards of operating a crane, and how to prevent these risks to operate safely at all times.

Objectives:
● Calculate weight, size, and shape to perform proper lifts using the crane.
● Demonstrate safety practices to prevent injury or damages when operating an overhead crane.
● Safely lift and move objects of extreme weight and awkward shapes.
● Apply safety practices, mathematics, and proper techniques to successfully perform varying types of movements, lifts, or rolls.

TECF 1025 Structural Fabrication I **3 Credits / 90 Clock-Hours**

This course is designed to teach students how to safely and effectively operate a variety of tools and machines. Students will understand the safe operating procedures of heavy equipment such as sheet benders, shears, pipe threaders, magnetic drill presses, mechanized track systems, and other common fabrication equipment. Additionally, Students will learn about structural material shapes, how to fabricate to structural code, and methods of steel erection used in the industry today. This course will involve and implement practices from previous courses, to help students understand the process of structural steel construction. They will be trained to use a wide variety of machinery and tools to successfully fabricate structural steel components.

Objectives:
• Perform start-up and operating procedures safely.
• Select the appropriate tool/machine for the preferred outcome.
• Use tools/machines proficiently.
• Demonstrate proper use of tools and equipment used to fabricate in the structural industry.
• Apply the process of structural design to fabrication and to erection.
• Fabricate structural steel components based off of engineered drawings and blueprints.
• Test for competency on structural shapes, methods, and common practices, as well as safety in handling materials and equipment maintenance.

TECF 1035 Structural Fabrication II **2 Credits / 60 Clock-Hours**

In this course, students will learn about structural material shapes, how to fabricate to structural code, and methods of steel erection used in the industry today. This course will involve and implement practices from previous courses, to help students understand the process of structural steel construction. They will be trained to use a wide variety of machinery and tools to successfully fabricate structural steel components.

Objectives:
• Demonstrate proper use of tools and equipment used to fabricate in the structural industry.
• Apply the process of structural design to fabrication and to erection.
• Fabricate structural steel components based off of engineered drawings and blueprints.
• Test for competency on structural shapes, methods, and common practices, as well as safety in handling materials and equipment maintenance.

TECF 1072 Pipe Fitting I **3 Credits / 90 Clock-Hours**

This course will teach students about the process of pipe fabrication. This will include learning about the different pipe materials and how to identify them. They will also learn how to use and maintain tools and equipment that is used in a pipe fabrication industry setting. Techniques and practices of pipefitting will be implemented.

Objectives:
• Demonstrate safe practices when working in a pipe-fitting work environment.
• Utilize and maintain pipe-fitting equipment and tools in a safe and efficient manner.
• Demonstrate knowledge of the different materials used in this field of work.
• Fabricate pipe projects (based on engineered drawings) that are held to the same standards and code as work done in the industry.
• Test for competency on pipe shapes, fitting methods, and common practices as well as safety in handling materials and equipment maintenance.

TECF 1075 Pipe Fitting II **2 Credits / 60 Clock-Hours**

This course will continue instruction in the process of pipe fabrication. Students will use and maintain tools and equipment common in the pipe fabrication industry. Techniques and practices of pipefitting will be implemented.

Objectives:
• Demonstrate safe practices when working in a pipe-fitting work environment.
• Utilize and maintain pipe-fitting equipment and tools in a safe and efficient manner.
• Fabricate pipe projects (based on engineered drawings) that are held to the same standards and code as work done in the industry.
• Test for competency on pipe shapes, fitting methods, and common practices as well as safety in handling materials and equipment maintenance.

TECF 1081 Final Project **3 Credits / 90 Clock-Hours**

This course will teach students introductory methods of design for 3-dimensional projects using the CAD software SolidWorks. It allows students to take a combined variety of learned knowledge and skills and apply them to a project of their choice. Students will have the opportunity to design, finalize, and fabricate a project of their own. This will help students understand how all components of fabrication come together and allow them to fabricate complex items while maintaining industrial codes and standards.

Objectives:
• Design a 3-dimensional picture for fabrication.
• Demonstrate various sketching methods that are used in the fabrication industry.
• Test to ensure that designs and drawings are made to industry standards
• Design and submit drawings of a personal choice project. Drawings will be accurate, and sufficiently detailed in order to continue to fabrication.
• Gather materials and cut them to dimensional tolerances.
• Assemble project, tack-weld and prep for welding.
• Weld project, inspection will follow to ensure that proper practices and procedures were applied.