UTAH SYSTEM OF HIGHER EDUCATION

Utah System of Higher Education
Manufacturing Technology
FY2027 / 10 Credits (300 Clock-Hours)

Foundational Courses

TEMN 1011 Introduction to Manufacturing — 1 Credit / 30 Clock-Hours

Introduction to Manufacturing explores common manufacturing processes and how they work together, including automation, machining, composites, and welding. During this course, you will become familiar with measuring tools, hand tools, power tools, and blueprints that are currently used in the various industries through hands-on labs. You will be required to demonstrate personal and machine safety as you complete a variety of activities.

Objectives:
• Demonstrate basic safety practices used in any manufacturing facility.
• Use shop math to solve manufacturing related problems.
• Read and use common measuring tools used in manufacturing.
• Practice safe and proper use of basic hand and power tools.
• Describe the basic operation of Lathes and Milling machines.
• Become familiar with each industry and how they work together.

TEMN 1051 Blueprint Reading — 1 Credit / 30 Clock-Hours

Blueprint reading for machinists will familiarize students with how to read and interpret mechanical blueprints. Topics covered in this course include the alphabet of lines, interpreting title block data, reading dimensions, tolerances, and surface finish, and interpreting multiple-view drawings, with sectional, auxiliary and projected views.

Objectives:
• Identify line, lettering, sketching, dimensioning, and title standards used in drafting.
• Identify symbols and views used on blueprints.
• Calculate missing dimensions on a drawing.
• Identify information necessary for production on a drawing.
• Define terminology and processes related to manufacturing drawings.
• Describe the function of drawings used in manufacturing.
• Demonstrate the proper use of linework as they pertain to drawings specifically created for the machining industry.
• From a three-dimensional part, determine the various views associated with that part.
• Demonstrate how to apply and read dimensioning elements associated with machined parts.
• Determine the differences between the American National Standards Institute (ANSI) and the International Standards Organization (ISO).

TEMN 1111 Composites for Manufacturing — 2 Credits / 60 Clock-Hours

Composite Basics introduces the basic materials, tools, vocabulary, and safety practices used in the composites industry. Throughout this course, you will examine various composite materials, chemicals, tools, and the procedures and processes of fabrication. You will also practice proper shop etiquette and cleaning.

Objectives:
- Identify the various businesses that employ composite technicians.
- Describe the different composite applications within the industry.
- Explain the role composites play in today's marketplace.
- Identify the various fabric types incorporated in laminations and describe how the different fabrics interact.
- Compare several resin systems and identify the parameters necessary to use each resin system.
- Describe epoxy resin systems.
- Demonstrate the ability to incorporate general shop safety practices.
- Identify shop areas and processing equipment by name.
- Explain Safety Data Sheets.

TEMN 1201 Automation Maintenance Basics — 2 Credits / 60 Clock-Hours

Maintenance Basics introduces the basic concepts and terminology used in Automation and Robotics. Throughout this course, you will study basic electrical, Electrical Motor Controls, Programmable Logic Controllers (PLC), HVAC, Pneumatics, Hydraulics, Robotics and Troubleshooting skills.

Objectives:
- Identify maintenance principles including safety and service and repair of electrical systems.
- Discuss electronics and PLCs, HVAC systems.
- Describe mechanical systems, robotic systems, and fluid power systems of automation maintenance aspects.

TEMN 1301 Welding for Manufacturing — 2 Credits / 60 Clock-Hours

Welding for Manufacturing includes the basic knowledge of Gas Metal Arc Welding (GMAW) and Shielded Metal Arc Welding (SMAW). During this course, you will study welding safety; protection, accident prevention, and troubleshooting. You will practice set-up, operation of equipment, positions, executions, and the workmanship needed for a basic weld.

Objectives:
- Describe oxyfuel cutting process terms.
- Demonstrate proper equipment setup, usage, cleaning, and break-down.
- Discuss and conduct safety inspections of equipment and accessories.
- List and describe oxyfuel cutting equipment.
- Perform setup, lighting, and use of oxyfuel cutting equipment.
- Demonstrate various cutting techniques including straight cuts, beveling, and gouging on various base metals.
- Name key terms for GMAW
- Make GMAW-S (Short Circuit) Fillet Welds the 2F position.
- Make GMAW-S (Short Circuit) Groove Welds in the 2G position.
- Make GMAW-S (Short Circuit) V Groove Welds in the 2G position.
- List key terms for SMAW.
- Perform Fillet welds on mild carbon steel with E7018 welding.
- Perform Groove welds in the Flat (1G) and horizontal (2G) with 7018.

TEMN 1600 Machining for Manufacturing **2 Credits / 60 Clock-Hours**

CNC Machining for Manufacturing will cover the basic procedures to run a CNC mill and Lathes encountered in the machine shop. During this course, you will study topics including instruction in machine startup, loading programs, setting tool offsets, work offsets and basic G code programming. We will also cover basic Programming using a CAM program topic will include basic part creation and programming.

Objectives:
• Use G code programming to create parts.
• Create basic tool path using CAM software.
• Identify safe practices and clean up procedures in a machine shop.
• Demonstrate accurate use and reading of steel rules, micrometers, and calipers to inspect parts while in the machine.
• Demonstrate proper feeds and speeds.
• Design parts using CAD software.
• Identify proper milling and turning cutters and their application.
• Perform basic turning and milling operations.