WELDING & METAL FABRICATION

Program Description
The Welding & Metal Fabrication program provides students with the unique opportunity to combine two highly skilled trades into one AAS degree by taking the one-year Welding Technology certificate and adding an additional year of training in Dunwoody’s state-of-the-art machine shop. Students gain the entry-level skills and theoretical knowledge to machine parts, layout assemblies for fabrication, weld assemblies, and finish weldments utilizing various machine tools.

Graduates from this program are prepared to enter the industry as welders, fabricators, machinists, and machine operators. The course of study includes: manual milling and turning; measurement and materials; job planning and layout; metallurgy; oxygen-fuel welding and cutting; shielded metal arc welding (SMAW-stick); gas metal arc welding (GMAW-MIG); gas tungsten arc welding (GTAW-TIG); and the various fabrication processes.

The program’s curriculum is closely aligned with standards set forth by National Institute of Metalworking Skills (NIMS) and the American Welding Society (AWS). Arts & Sciences curriculum supports the technical coursework by enhancing the students’ communication, mathematics, and critical thinking skills. A shorter certificate option is also available.

Dunwoody College of Technology: a non-profit, private technical college since 1914.

Credential Earned | AAS Degree
--- | ---
Classes Offered | Day
Length of Program | 2 years (4 semesters)
Available Starts | Fall Semester; Spring Semester
Further Study | Bachelor’s Completion Degree in Industrial Engineering Technology

Recent Employers
- Despatch Industries
- Caterpillar, Inc.
- GE Power & Water
- BAUER Manufacturing
- Millwrights Local 548

Salary Data
- $42,870*
- Annual Average Salary

Placement Rate
- 100%**

Common Job Titles
- Welder
- Fabricator
- Millwright
- Pipefitter
- Machinist

Degree Requirements
- WELD1110* Introduction to Welding Lab
- WELD1120* Introduction to Welding Theory
- WELD1130* Welding Math, Prints & Symbols
- WELD1210* Advanced Welding Lab
- WELD1221* Advanced Welding Theory & Applications
- MACH1110 Machine Tool Fundamentals Lab
- MACH1120 Machine Tool Fundamentals Theory
- MDES1110 Engineering Drawings with SolidWorks
- MACH1210 Advanced Machining Lab
- MACH1220 Advanced Machining Theory
- MDES1230 Geometric Dimensioning & Tolerances
- ARTS1350* Structural Drawing
- MATH1050 Algebra, Trigonometry & Geometry
- MATH1200 Machine Math

*Courses required for the Welding Technology certificate
**Data reflects placement for AY2018-19 graduates indicating employment in their field of study within 6 months following graduation.
Course Descriptions

WELD1110 Introduction to Welding Lab, 5 cr.
Perform welding of standard joint designs on various thicknesses of steel plate. Practice oxyacetylene welding and cutting (OAW), stick welding (SMAW), and wire feed welding (GMAW). Introduction to tungsten inert gas (TIG) welding. Demonstrate shop safety, setup and troubleshooting of welding equipment and applications.

WELD1120 Introduction to Welding Theory, 4 cr.
Identification, recognition and calculations associated with weld joint designs and weld materials. Examine various weld processes: oxyacetylene welding and cutting (OAW), stick welding (SMAW), wire feed welding (GMAW). Introduction to tungsten inert gas (TIG) welding. Examine shop safety, setup and troubleshooting of welding equipment and applications.

WELD1130 Welding Math, Prints & Symbols, 4 cr.
Principles of weld print reading, measuring systems, decimal/fraction conversions, dimensioning, layout, orthographic views, technical math, and section views.

WELD1210 Advanced Welding Lab, 5 cr.
Practice welding of steel plate and aluminum alloys using stick welding (SMAW), wire feed welding (GMAW) and tungsten inert gas (TIG) welding. Demonstrate shop safety, grinding, finishing, and cutting practices in a final fabrication project.

WELD1221 Advanced Welding Theory & Applications, 8 cr.
Identification, recognition, and calculations associated with weld joint designs and assemblies using various welding and metallurgical processes. Other topics include: material selection, layout, fixturing, weldment inspection and lean manufacturing. Culminates in a designed and fabricated project.

MACH1110 Machine Tool Fundamentals Lab, 5 cr.
Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

MACH1120 Machine Tool Fundamentals Theory, 4 cr.
Identification, recognition and calculations associated with basic principles in metal-cutting technology including machine feeds and speeds, threading, tapers, knurling, boring, radii cutting and milling and turning procedures.

MDES1110 Engineering Drawings with SolidWorks, 4 cr.
Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

MACH1210 Advanced Machining Lab, 5 cr.
Advanced manufacturing of parts through layout, bench work and job planning. Advanced manual turning and milling and an introduction to CNC M & G codes. CNC portion includes manual programming via machine control and software simulation.

MACH1220 Advanced Machining Theory, 4 cr.
Identification, recognition and calculations associated with advanced milling and turning operations, inspection of finished parts and an introduction to the G & M codes used in CNC programming. CNC portion includes manual programming in notepad and Immersive software simulation.

MDES1230 Geometric Dimensioning & Tolerances, 4 cr.
Principles of geometric dimensioning and tolerancing in the context of engineering and manufacturing. Application of principles using coordinate measurement machines.

ARTS1350 Structural Drawing, 3 cr.
Basic drawing concepts and techniques are studied through demonstrations, discussions, critiques, slide lectures, and the use of a sketchbook. Working from observation and using line, tone and the rules of linear perspective to solve spatial, compositional and color/light problems and form a 3-dimensional illusion of space as it relates to human constructs.

MATH1050 Algebra, Trigonometry & Geometry, 3 cr.
Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

MATH1200 Machine Math, 3 cr.
Translation of engineering drawing dimensions to machine working dimensions. Integration of algebra, geometry and trigonometry to solve machine applications. Applications of compound angles.