

Welding and Welding Certificate (WLD & WLDC)

Welding (WLD)

The Welding degree prepares students for high-demand employment opportunities in industries such as manufacturing, construction, automotive, aerospace, and energy piping.

Students gain hands-on skill training in oxyacetylene welding (OAW), oxyfuel cutting (OFC), shielded metal arc welding (SMAW), gas metal arc welding (GMAW), flux core arc welding (FCAW), and gas tungsten arc welding (GTAW). Students also develop knowledge and skills in other welding areas including metal fabrication, visual inspection, and blueprint reading.

The degree program includes cooperative education work opportunities as well.

The Welding associate's degree curriculum is aligned with the American Welding Society's SENSE program.

For more information, please contact the Center for Innovative Technologies at (513) 569-1743.

To apply for this program at Cincinnati State, visit the Admissions (<http://www.cincinnati.edu/academics/admission>) section of the College website.

Welding Certificate (WLDC)

The Welding Certificate prepares students for immediate employment in organizations where welders are in demand, including manufacturing, construction, automotive, and energy industries. The program includes hands-on practice in a variety of welding processes as well as metal fabrication, testing, and quality control.

Graduates are prepared to take certification tests offered by the American Welding Society.

For more information, please contact the Center for Innovative Technologies at (513) 569-1743.

To apply for this program at Cincinnati State, visit the Admissions (<http://www.cincinnati.edu/academics/admission>) section of the College website.

Welding (WLD)

| Semester 1 | | Lec | Lab | Credits |
|------------|--------------------------------------|-----|-----|---------|
| WLD 100 | Fundamentals of Welding (B) | 2 | 3 | 3 |
| WLD 105 | Print Reading and Weld Design (B) | 2 | 2 | 3 |
| FYE 1XX | First Year Experience Elective (B) | 1 | 0 | 1 |

| | | | | |
|-------------------|---|----|-----|----|
| PSY 1XX | Psychology Elective (G) | 3 | 0 | 3 |
| XXX XXX | Arts/ Humanities Elective or Natural Science Elective (G) | 3 | 0 | 3 |
| Semester 2 | | | | |
| WLD 111 | Shielded Metal Arc Welding 1 (B) | 2 | 6 | 4 |
| WLD 115 | Gas Metal Arc Welding and Flux Cored Arc Welding (B) | 2 | 6 | 4 |
| ENG 101 | English Composition 1 (G) | 3 | 0 | 3 |
| MAT 120 | Technical Mathematics (G) | 2 | 2 | 3 |
| Semester 3 | | | | |
| WLD 260 | Weldability of Metals (T) | 2 | 2 | 3 |
| MET 111 | Manufacturing Processes 1 (T) | 2 | 3 | 3 |
| MET 131 | MET Computer Aided Drafting 1 (T) | 2 | 3 | 3 |
| ENG 10X | English Composition Elective (G) | 3 | 0 | 3 |
| Semester 4 | | | | |
| WLD 210 | Gas Tungsten Arc Welding (T) | 2 | 6 | 4 |
| WLD 231 | Pipe Welding 1 (T) | 2 | 6 | 4 |
| CIT 105 | OSHA 10 General Industry Safety (T) | 1 | 0 | 1 |
| XXX XXX | Welding Technical Elective (T) | 2 | 2 | 3 |
| Semester 5 | | | | |
| WLD 220 | Metal Fabrication (T) | 2 | 3 | 3 |
| WLD 291 | Full-Time Cooperative Education 1: Welding (T) | 1 | 40 | 2 |
| Semester 6 | | | | |
| WLD 292 | Full-Time Cooperative Education 2: Welding (T) | 1 | 40 | 2 |
| WLD 250 | Welding Inspection and Codes (T) | 2 | 3 | 3 |
| Total Credits: | | 42 | 127 | 61 |

Electives

First Year Experience Elective

| | | |
|---------|------------------------------|---|
| FYE 100 | College Survival Skills | 1 |
| FYE 105 | College Success Strategies | 2 |
| FYE 110 | Community College Experience | 3 |

Psychology Elective

| | | |
|---------|---------------------------------------|---|
| PSY 100 | Applied Psychology: Human Relations | 3 |
| PSY 102 | Applied Psychology: Stress Management | 3 |
| PSY 110 | Introduction to Psychology | 3 |

Arts/Humanities Elective (take one course from either Arts/ Humanities or Natural Science) 3

Any ART, FRN, LIT, MUS, PHI, POL, REL, SPN, THE

Natural Sciences Elective (take one course from either Arts/ Humanities or Natural Sciences)

Any CHE, EVS, PHY, PSC

English Composition Elective

| | | |
|---------|--|---|
| ENG 102 | English Composition 2: Contemporary Issues | 3 |
| ENG 104 | English Composition 2: Technical Communication | 3 |
| ENG 105 | English Composition 2: Business Communication | 3 |

Welding Technical Elective

| | | |
|---------|-------------------------------|---|
| EET 101 | Electronic Fundamentals 1 | 3 |
| MET 112 | Manufacturing Processes 2 | 3 |
| MET 132 | MET Computer Aided Drafting 2 | 3 |
| MET 140 | Engineering Materials | 3 |
| WLD 112 | Shielded Metal Arc Welding 2 | 4 |
| WLD 232 | Pipe Welding 2 | 4 |

The letters G, B, and T (displayed after course titles or elective descriptions) identify types of courses required by the Ohio Department of Higher Education as part of an associate's degree curriculum.

G = General Education course in this curriculum

B = Basic Skills course in this curriculum

T = Technical course in this curriculum

Welding Certificate (WLDC)

| Semester 1 | | Lec | Lab | Credits |
|----------------|--|-----|-----|---------|
| WLD 100 | Fundamentals of Welding | 2 | 3 | 3 |
| WLD 105 | Print Reading and Weld Design | 2 | 2 | 3 |
| MAT 120 | Technical Mathematics | 3 | 0 | 3 |
| Semester 2 | | | | |
| WLD 111 | Shielded Metal Arc Welding 1 | 2 | 6 | 4 |
| MET 111 | Manufacturing Processes 1 | 2 | 3 | 3 |
| MET 131 | MET Computer Aided Drafting 1 | 2 | 3 | 3 |
| Semester 3 | | | | |
| WLD 115 | Gas Metal Arc Welding and Flux Cored Arc Welding | 2 | 6 | 4 |
| WLD 210 | Gas Tungsten Arc Welding | 2 | 6 | 4 |
| CIT 105 | OSHA 10 General Industry Safety | 1 | 0 | 1 |
| WLD XXX | Technical Elective | 2 | 3 | 3 |
| Total Credits: | | 20 | 32 | 31 |

Electives

Technical Elective

| | | |
|---------|------------------------------|---|
| WLD 112 | Shielded Metal Arc Welding 2 | 4 |
| WLD 220 | Metal Fabrication | 3 |
| WLD 260 | Weldability of Metals | 3 |

Welding (WLD)

- Ability to weld in flat, horizontal, vertical, and overhead positions using the basic welding processes SMAW, GMAW, FCAW, and GTAW and pipe.
- Ability to perform metal layout processes.
- Ability to cut metals using oxyfuel, plasma, and arc cutting processes.
- Ability to apply the principles of metallurgy during the welding process.
- Ability to read and interpret basic blueprints and welding symbols to fabricate components.
- Ability to apply basic math and measurement to welding processes.
- Ability to follow industry safety practices.
- Successful completion of OSHA 10 credential.

Faculty

Program Chair/Advisor

Professor Michael DeVore, PhD, PE
michael.devore@cincinnatiatstate.edu

Co-op Coordinator

Professor Sue Dolan, M.Ed.
sue.dolan@cincinnatiatstate.edu

Courses

WLD 100 Fundamentals of Welding

3 Credits. 2 Lecture Hours. 3 Lab Hours.

A course on fundamental principles of welding and joining processes. Topics include: oxy-acetylene welding and cutting techniques, plasma cutting, track cutting, and welding safety.
Prerequisites: None

WLD 105 Print Reading and Weld Design

3 Credits. 2 Lecture Hours. 2 Lab Hours.

A course on interpreting various types of prints used in the welding industry. Topics include: print reading, measurements, types of welds and joints, welding symbols, technical math, and metric conversions.
Prerequisites: AFM 092 or appropriate placement test score

WLD 111 Shielded Metal Arc Welding 1

4 Credits. 2 Lecture Hours. 6 Lab Hours.

A course on techniques and operations associated with Shielded Metal Arc Welding (SMAW). Topics include: SMAW theory and operating principles, all-position welding of groove welds, and fillet welding using electrodes E6010, E6013, and E7018.
Prerequisites: WLD 100

WLD 112 Shielded Metal Arc Welding 2

4 Credits. 2 Lecture Hours. 6 Lab Hours.

A continuation of WLD 111 covering techniques and operations associated with Shielded Metal Arc Welding (SMAW). Topics include: all-positions open V-groove welds on plate, and fillet welds.
Prerequisites: WLD 111

**WLD 115 Gas Metal Arc Welding and Flux Cored Arc Welding
4 Credits. 2 Lecture Hours. 6 Lab Hours.**

A course on welding techniques associated with Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW). Topics include: theory, operating principles, equipment, and accessories; GMAW spray transfer techniques; and FCAW-G/GM (dual shielded) and FCAW-S (self-shielded) operations.

Prerequisites: WLD 100

**WLD 191 Part-Time Cooperative Education 1: Welding
1 Credit. 1 Lecture Hour. 20 Lab Hours.**

Students seeking an associate's degree participate in their first part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 115

**WLD 192 Part-Time Cooperative Education 2: Welding
1 Credit. 1 Lecture Hour. 20 Lab Hours.**

Students seeking an associate's degree participate in their second part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 191

**WLD 193 Part-Time Cooperative Education 3: Welding
1 Credit. 1 Lecture Hour. 20 Lab Hours.**

Students seeking an associate's degree participate in their third part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 192

**WLD 194 Part-Time Cooperative Education 4: Welding
1 Credit. 1 Lecture Hour. 20 Lab Hours.**

Students seeking an associate's degree participate in their fourth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 193

**WLD 195 Part-Time Cooperative Education 5: Welding
1 Credit. 1 Lecture Hour. 20 Lab Hours.**

Students seeking an associate's degree participate in their fifth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 194

**WLD 196 Part-Time Cooperative Education 6: Welding
1 Credit. 1 Lecture Hour. 20 Lab Hours.**

Students seeking an associate's degree participate in their sixth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 195

**WLD 198 First Year Special Topics in Welding
1-9 Credits. 0 Lecture Hour. 0 Lab Hour.**

A course on selected topics related to Welding, which gives students opportunities to study information not currently covered in other courses. Grades issued are A, B, C, D, or F.

Prerequisites: Vary by section

**WLD 199 First Year Independent Project in Welding
1-9 Credits. 0 Lecture Hour. 0 Lab Hour.**

A project related to Welding that is completed by one or more students to meet specific educational goals. Projects must have prior approval and supervision by Welding faculty. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: Vary by section

**WLD 210 Gas Tungsten Arc Welding
4 Credits. 2 Lecture Hours. 6 Lab Hours.**

A course on techniques and operations associated with Gas Tungsten Arc Welding (GTAW). Topics include: GTAW theory, machines and set up, GTAW welding on non-ferrous and ferrous materials, and GTAW all-positions welding.

Prerequisites: WLD 100

**WLD 220 Metal Fabrication
3 Credits. 2 Lecture Hours. 3 Lab Hours.**

A course on metal fabrication techniques used in industry. Topics include: thermal cutting; oxy-fuel gas cutting; plasma arc cutting; basic metal fabrication, layout, assembly, and fit-up; and heat distortion effects.

Prerequisites: WLD 105 and WLD 115

**WLD 231 Pipe Welding 1
4 Credits. 2 Lecture Hours. 6 Lab Hours.**

A course on basic techniques associated with pipe welding operations. Topics include: pipe welding theory; pipe welding positions, layout, and preparation; and welding in the 2G and 5G positions with electrodes E6010 and E7018.

Prerequisites: WLD 111

**WLD 232 Pipe Welding 2
4 Credits. 2 Lecture Hours. 6 Lab Hours.**

A continuation of WLD 231 covering techniques associated with pipe welding operations. Topics include: pipe welding theory and nomenclature; safety; advanced pipe welding positions, layout, and preparation; and welding in the 5G and 6G positions using shielded metal arc welding (SMAW) and gas tungsten arc welding (GTAW) processes.

Prerequisites: WLD 231

**WLD 250 Welding Inspection and Codes
3 Credits. 2 Lecture Hours. 3 Lab Hours.**

A course on welding techniques as applied to the American Welding Society Structural Steel Code D1.1. Topics include: weld discontinuities, visual examination, intermediate layers, completed welds, and required documentation. Students perform welder qualification tests and practice inspecting weld defects.

Prerequisites: WLD 111

**WLD 260 Weldability of Metals
3 Credits. 2 Lecture Hours. 2 Lab Hours.**

A course on properties of metals that affect weldability. Topics include: carbon steels, low alloy steels, tool steels, and stainless steels; cast iron and non-ferrous metals; processes including pre-heating, post-heating, annealing, normalizing, and hardening; repair welding techniques; and Rockwell hardness testing.

Prerequisites: WLD 100

WLD 291 Full-Time Cooperative Education 1: Welding

2 Credits. 1 Lecture Hour. 40 Lab Hours.

Students seeking an associate's degree participate in their first full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 100

WLD 292 Full-Time Cooperative Education 2: Welding

2 Credits. 1 Lecture Hour. 40 Lab Hours.

Students seeking an associate's degree participate in their second full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 291

WLD 293 Full-Time Cooperative Education 3: Welding

2 Credits. 1 Lecture Hour. 40 Lab Hours.

Students seeking an associate's degree participate in their third full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 292

WLD 294 Internship 1: Welding

2 Credits. 1 Lecture Hour. 40 Lab Hours.

Students seeking an associate's degree participate in their first unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 100

WLD 295 Internship 2: Welding

2 Credits. 1 Lecture Hour. 40 Lab Hours.

Students seeking an associate's degree participate in their second unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: WLD 294

WLD 298 Second Year Special Topics in Welding

1-9 Credits. 0 Lecture Hour. 0 Lab Hour.

A course on selected topics related to Welding, which gives students opportunities to study information not currently covered in other courses. Grades issued are A, B, C, D, or F.

Prerequisites: Vary by section

WLD 299 Second Year Independent Project in Welding

1-9 Credits. 0 Lecture Hour. 0 Lab Hour.

A project related to Welding that is completed by one or more students to meet specific educational goals. Projects must have prior approval and supervision by Welding faculty. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: Vary by section