

Welding Technology

Welding Technology Suggested Course Sequences

The following is the suggested plan for when to take each course to complete the Associate in Applied Science degree, based on the program requirements of the 2023-2024 catalog. This is only a recommendation — you may take courses in another order upon consultation with your advisor. This plan is based on you starting with college-level math and English courses, starting your program in the fall, and attending full-time. You can also follow this sequence if you attend part-time. Speak with your academic advisor about the plan and any questions. This program might also offer diplomas or certificates; visit the catalog or contact the program for details. Visit the Academic Advising page for instructions on locating your assigned advisor: <https://www.cpcc.edu/academics/academic-advising>

- Welding Technology - Automation (A50420A) (p. 1)
- Welding Technology - Construction Pipe and Heavy Maintenance (A50420C) (p. 1)
- Welding Technology - Construction Pipe-Fitting and Installation (A50420P) (p. 2)
- Welding Technology - Entrepreneurial Business and Sales (A50420E) (p. 2)
- Welding Technology - Fabrication and Manufacturing (A50420F) (p. 2)

Welding Technology - Automation (A50420A)

Term I		Credits
WLD 110	Cutting Processes	2.0
WLD 115	SMAW (Stick) Plate	5.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0
WLD 131	GTAW (TIG) Plate	4.0
WLD 141	Symbols and Specifications	3.0
ACA 122	College Transfer Success	1.0
You may have completed a program certificate(s). Confirm eligibility with your academic advisor.		
Credits		19
Term II		Credits
WLD 265	Automated Welding/Cutting	4.0
WLD 112	Basic Welding Processes	2.0
WLD 143	Welding Metallurgy	2.0
CIS 110	Introduction to Computers	3.0
WOL 110	Basic Construction Skills	3.0
You may have completed program certificate C50420-13. Confirm eligibility with your academic advisor.		
Credits		14
Term III		Credits
MAT 110 or MAT 143	Mathematical Measurement and Literacy or Quantitative Literacy	3.0
COM 110 or COM 231	Introduction to Communication or Public Speaking	3.0
ENG 111	Writing and Inquiry	3.0
Credits		9
Term IV		Credits
WLD 270	Orbital Welding TIG/Pipe	4.0
WLD 262 or NDE 110	Inspection & Testing or Intro to Nondestructive Examination	3.0
Humanities/Fine Arts		3.0
Credits		10

ENG 112 or ENG 113 or ENG 114	Writing and Research in the Disciplines or Literature-Based Research or Professional Research & Reporting	3.0
PFT 110	Introduction to Pipe Fitting	4.0

You may have completed a program certificate(s). Confirm eligibility with your academic advisor.

Term V		Credits
WLD 268	Robotic Gas Metal Arc Welding	4.0
WLD 151	Fabrication I	4.0
ELC 111	Introduction to Electricity	3.0
Behavioral/Social Science		3.0
Credits		14
Total Credits		73

Welding Technology - Construction Pipe and Heavy Maintenance Welding (A50420C)

Term I		Credits
WLD 110	Cutting Processes	2.0
WLD 115	SMAW (Stick) Plate	5.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0
WLD 131	GTAW (TIG) Plate	4.0
WLD 141	Symbols and Specifications	3.0
ACA 122	College Transfer Success	1.0

You may have completed a program certificate(s). Confirm eligibility with your academic advisor.

Term II		Credits
WLD 122 or WLD 132	GMAW (MIG) Plate/Pipe or GTAW (TIG) Plate/Pipe	3.0
WLD 143	Welding Metallurgy	2.0
CIS 110	Introduction to Computers	3.0
WOL 110	Basic Construction Skills	3.0

You may have completed program certificate C50420-12. Confirm eligibility with your academic advisor.

Term III		Credits
MAT 110 or MAT 143	Mathematical Measurement and Literacy or Quantitative Literacy	3.0
COM 110 or COM 231	Introduction to Communication or Public Speaking	3.0
ENG 111	Writing and Inquiry	3.0
Credits		9

Term IV		Credits
WLD 116	SMAW (stick) Plate/Pipe	4.0
WLD 262 or NDE 110	Inspection & Testing or Intro to Nondestructive Examination	3.0
Humanities/Fine Arts		3.0
ENG 112 or ENG 113 or ENG 114	Writing and Research in the Disciplines or Literature-Based Research or Professional Research & Reporting	3.0
WLD 221 or WLD 231	GMAW (MIG) Pipe or GTAW (TIG) Pipe	3.0

You may have completed a program certificate(s). Confirm eligibility with your academic advisor.

Term V		Credits
WLD 261	Certification Practices	2.0
WLD 151	Fabrication I	4.0
WLD 215 or WLD 270	SMAW (stick) Pipe or Orbital Welding TIG/Pipe	4.0

Welding Technology

Behavioral/Social Science	3.0
Credits	13
Total Credits	68

Welding Technology - Construction Pipe-Fitting and Installation (A50420P)

Term I	Credits
WLD 110 Cutting Processes	2.0
WLD 115 SMAW (Stick) Plate	5.0
WLD 121 GMAW (MIG) FCAW/Plate	4.0
WLD 131 GTAW (TIG) Plate	4.0
WLD 141 Symbols and Specifications	3.0
ACA 122 College Transfer Success	1.0

You may have completed a program certificate(s). Confirm eligibility with your academic advisor.

Credits	19
----------------	-----------

Term II	Credits
PFT 110 Introduction to Pipe Fitting	4.0
WLD 112 Basic Welding Processes	2.0
WLD 143 Welding Metallurgy	2.0
CIS 110 Introduction to Computers	3.0
WOL 110 Basic Construction Skills	3.0

Credits	14
----------------	-----------

Term III	Credits
MAT 121 Algebra/Trigonometry I	3.0
COM 110 Introduction to Communication or COM 231 or Public Speaking	3.0
ENG 111 Writing and Inquiry	3.0

You may have completed program certificate C50420-30. Confirm eligibility with your academic advisor.

Credits	9
----------------	----------

Term IV	Credits
WLD 270 Orbital Welding TIG/Pipe	4.0
WLD 262 Inspection & Testing or NDE 110 or Intro to Nondestructive Examination	3.0
Humanities/Fine Arts	3.0
ENG 112 Writing and Research in the Disciplines or ENG 113 or Literature-Based Research or ENG 114 or Professional Research & Reporting	3.0
PFT 210 Advanced Pipe Fitting	4.0

Credits	17
----------------	-----------

Term V	Credits
WLD 132 GTAW (TIG) Plate/Pipe or WLD 116 or SMAW (stick) Plate/Pipe	3.0
WLD 151 Fabrication I	4.0
Behavioral/Social Science	3.0

Credits	10
----------------	-----------

Total Credits	69
----------------------	-----------

Welding Technology - Entrepreneurial Welding Business & Technical Sales (A50420E)

Term I	Credits
WLD 110 Cutting Processes	2.0
WLD 115 SMAW (Stick) Plate	5.0
WLD 121 GMAW (MIG) FCAW/Plate	4.0
WLD 131 GTAW (TIG) Plate	4.0
WLD 141 Symbols and Specifications	3.0
ACA 122 College Transfer Success	1.0

You may have completed a program certificate(s). Confirm eligibility with your academic advisor.

Credits	19
----------------	-----------

Term II	Credits
BUS 110 Introduction to Business	3.0

WLD 143 Welding Metallurgy	2.0
CIS 110 Introduction to Computers	3.0
WOL 110 Basic Construction Skills	3.0

You may have completed program certificate C50420-13. Confirm eligibility with your academic advisor.

Credits	11
----------------	-----------

Term III	Credits
MAT 110 Mathematical Measurement and Literacy or MAT 143 or Quantitative Literacy	3.0
COM 110 Introduction to Communication or COM 231 or Public Speaking	3.0
ENG 111 Writing and Inquiry	3.0

Credits	9
----------------	----------

Term IV	Credits
WLD 265 Automated Welding/Cutting or WLD 270 or Orbital Welding TIG/Pipe	4.0
WLD 262 Inspection & Testing or NDE 110 or Intro to Nondestructive Examination	3.0
Humanities/Fine Arts	3.0
ENG 112 Writing and Research in the Disciplines or ENG 113 or Literature-Based Research or ENG 114 or Professional Research & Reporting	3.0
BUS 137 Principles of Management	3.0

Credits	16
----------------	-----------

Term V	Credits
BUS 139 Entrepreneurship I or BUS 230 or Small Business Management	3.0
WLD 151 Fabrication I	4.0
ELC 111 Introduction to Electricity	3.0
Behavioral/Social Science	3.0

You may have completed a program certificate(s). Confirm eligibility with your academic advisor.

Credits	13
----------------	-----------

Total Credits	68
----------------------	-----------

Welding Technology - Fabrication and Manufacturing (A50420F)

Term I	Credits
WLD 110 Cutting Processes	2.0
WLD 115 SMAW (Stick) Plate	5.0
WLD 121 GMAW (MIG) FCAW/Plate	4.0
WLD 131 GTAW (TIG) Plate	4.0
WLD 141 Symbols and Specifications	3.0

You may have completed a program certificate(s). Confirm eligibility with your academic advisor.

Credits	18
----------------	-----------

Term II	Credits
ACA 122 College Transfer Success	1.0
MAC 121 Introduction to CNC	2.0
WLD 143 Welding Metallurgy	2.0
CIS 110 Introduction to Computers	3.0
WOL 110 Basic Construction Skills	3.0
WLD 132 GTAW (TIG) Plate/Pipe	3.0

You may have completed program certificate C50420-13. Confirm eligibility with your academic advisor.

Credits	14
----------------	-----------

Term III	Credits
MAT 110 Mathematical Measurement and Literacy or MAT 143 or Quantitative Literacy	3.0
COM 110 Introduction to Communication or COM 231 or Public Speaking	3.0
ENG 111 Writing and Inquiry	3.0

Credits	9
----------------	----------

Term IV		
ELC 111	Introduction to Electricity	3.0
WLD 262	Inspection & Testing	3.0
or NDE 110	or Intro to Nondestructive Examination	
ENG 112	Writing and Research in the Disciplines	3.0
or ENG 113	or Literature-Based Research	
or ENG 114	or Professional Research & Reporting	
WLD 151	Fabrication I	4.0
WBL 111	Work-Based Learning I	1.0
You may have completed a program certificate(s). Confirm eligibility with your academic advisor.		
	Credits	14
Term V		
WLD 251	Fabrication II	3.0
WLD 265	Automated Welding/Cutting	4.0
Humanities/Fine Arts		3.0
Behavioral/Social Science		3.0
	Credits	13
	Total Credits	68

WLD 110. Cutting Processes. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course introduces oxy-fuel and plasma-arc cutting systems. Topics include safety, proper equipment setup, and operation of oxy-fuel and plasma-arc cutting equipment with emphasis on straight line, curve and bevel cutting. Upon completion, students should be able to oxy-fuel and plasma-arc cut metals of varying thickness.

WLD 111. Oxy-Fuel Welding. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course introduces the oxy-fuel welding process. Topics include safety, proper equipment setup, and operation of oxy-fuel welding equipment with emphasis on bead application, profile, and discontinuities. Upon completion, students should be able to oxy-fuel weld fillets and grooves on plate and pipe in various positions.

WLD 112. Basic Welding Processes. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course introduces basic welding and cutting. Emphasis is placed on beads applied with gases, mild steel fillers, and electrodes and the capillary action of solder. Upon completion, students should be able to set up welding and oxy-fuel equipment and perform welding, brazing, and soldering processes.

WLD 115. SMAW (Stick) Plate. 5.0 Credits. Class-2.0. Clinical-0.0. Lab-9.0. Work-0.0

This course introduces the shielded metal arc (stick) welding process. Emphasis is placed on padding, fillet, and groove welds in various positions with SMAW electrodes. Upon completion, students should be able to perform SMAW fillet and groove welds on carbon plate with prescribed electrodes.

WLD 116. SMAW (stick) Plate/Pipe. 4.0 Credits. Class-1.0. Clinical-0.0. Lab-9.0. Work-0.0

This course is designed to enhance skills with the shielded metal arc (stick) welding process. Emphasis is placed on advancing manipulative skills with SMAW electrodes on varying joint geometry. Upon completion, students should be able to perform groove welds on carbon steel with prescribed electrodes in the flat, horizontal, vertical, and overhead positions.

Prerequisites: Take WLD 115

WLD 121. GMAW (MIG) FCAW/Plate. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course introduces metal arc welding and flux core arc welding processes. Topics include equipment setup and fillet and groove welds with emphasis on application of GMAW and FCAW electrodes on carbon steel plate. Upon completion, students should be able to perform fillet welds on carbon steel with prescribed electrodes in the flat, horizontal, and overhead positions.

WLD 122. GMAW (MIG) Plate/Pipe. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-6.0. Work-0.0

This course is designed to enhance skills with the gas metal arc (MIG) welding process. Emphasis is placed on advancing skills with the GMAW process making groove welds on carbon steel plate and pipe in various positions. Upon completion, students should be able to perform groove welds with prescribed electrodes on various joint geometry.

Prerequisites: Take WLD 121

WLD 131. GTAW (TIG) Plate. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course introduces the gas tungsten arc (TIG) welding process. Topics include correct selection of tungsten, polarity, gas, and proper filler rod with emphasis placed on safety, equipment setup, and welding techniques. Upon completion, students should be able to perform GTAW fillet and groove welds with various electrodes and filler materials.

WLD 132. GTAW (TIG) Plate/Pipe. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-6.0. Work-0.0

This course is designed to enhance skills with the gas tungsten arc (TIG) welding process. Topics include setup, joint preparation, and electrode selection with emphasis on manipulative skills in all welding positions on plate and pipe. Upon completion, students should be able to perform GTAW welds with prescribed electrodes and filler materials on various joint geometry.

Prerequisites: Take WLD 131

WLD 141. Symbols and Specifications. 3.0 Credits. Class-2.0. Clinical-0.0. Lab-2.0. Work-0.0

This course introduces the basic symbols and specifications used in welding. Emphasis is placed on interpretation of lines, notes, welding symbols, and specifications. Upon completion, students should be able to read and interpret symbols and specifications commonly used in welding. Prerequisites: Take 1 group: Take DMA 010 DMA 020 DMA 030; Take MAT 003

WLD 143. Welding Metallurgy. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-2.0. Work-0.0

This course introduces the concepts of welding metallurgy. Emphasis is placed on basic metallurgy, effects of welding on various metals, and metal classification and identification. Upon completion, students should be able to understand basic metallurgy, materials designation, and classification systems used in welding.

WLD 145. Thermoplastic Welding. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course introduces the thermoplastic welding processes and materials identification. Topics include filler material selection, identification, joint design, and equipment setup with emphasis on bead types and applications. Upon completion, students should be able to perform fillet and groove welds using thermoplastic materials.

WLD 151. Fabrication I. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course introduces the basic principles of fabrication. Emphasis is placed on safety, measurement, layout techniques, cutting, joining techniques, and the use of fabrication tools and equipment. Upon completion, students should be able to perform layout activities and operate various fabrication and material handling equipment.

Prerequisites: Take WLD 110 WLD 121 WLD 131 WLD 141

WLD 152. Wrought Metals I. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course provides a comprehensive overview of the history and the multifaceted skillsets that are required to join and shape ferrous and non-ferrous metals. Topics include heating methods and fire control, hand hammers, hand tools, forging, manual heating, heat treatment, and shaping functional and decorative metal objects. Upon completion, students should be able to select proper alloys, heat and use a variety of hand tools to create simple tools, and shape basic metal projects to produce functional and decorative metal objects, collars, and mortise and tenon joints.

Corequisites: Take WLD 112

WLD 215. SMAW (stick) Pipe. 4.0 Credits. Class-1.0. Clinical-0.0. Lab-9.0. Work-0.0

This course covers the knowledge and skills that apply to welding pipe. Topics include pipe positions, joint geometry, and preparation with emphasis placed on bead application, profile, and discontinuities. Upon completion, students should be able to perform SMAW welds to applicable codes on carbon steel pipe with prescribed electrodes in various positions.

Prerequisites: Take WLD 115 WLD 116

WLD 221. GMAW (MIG) Pipe. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-6.0. Work-0.0

This course covers the knowledge and skills that apply to welding pipe. Topics include pipe positions, joint geometry, and preparation with emphasis placed on bead application, profile, and discontinuities. Upon completion, students should be able to perform GMAW welds to applicable codes on pipe with prescribed electrodes in various positions.

Prerequisites: Take WLD 122

WLD 231. GTAW (TIG) Pipe. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-6.0. Work-0.0

This course covers gas tungsten arc welding on pipe. Topics include joint preparation and fit up with emphasis placed on safety, GTAW welding technique, bead application, and joint geometry. Upon completion, students should be able to perform GTAW welds to applicable codes on pipe with prescribed electrodes and filler materials in various pipe positions.

Prerequisites: Take WLD 132

WLD 251. Fabrication II. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-6.0. Work-0.0

This course covers advanced fabrication skills. Topics include advanced layout and assembly methods with emphasis on the safe and correct use of fabrication tools and equipment. Upon completion, students should be able to fabricate projects from working drawings.

Prerequisites: Take WLD 151

WLD 252. Wrought Metals II. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course covers ideas and techniques for designing, heating, shaping, and heat treatment of ferrous and non-ferrous metals, and the technical skills required for producing tools used in the welding studio. Topics include refined hammer control, power tool usage, metal lamination and differential hardening, tool design, alloy selection, hardening and tempering processes, and developing shop tooling. Upon completion, students should be able to identify and select appropriate metals and use traditional and contemporary metal-forming techniques to produce functional and decorative metal objects.

Corequisites: Take WLD 152

WLD 261. Certification Practices. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course covers certification requirements for industrial welding processes. Topics include techniques and certification requirements for prequalified joint geometry. Upon completion, students should be able to perform welds on carbon steel plate and/or pipe according to applicable codes.

Prerequisites: Take all: WLD 115, WLD 121, and WLD 131

Corequisites: WLD 215 WLD 231

WLD 262. Inspection & Testing. 3.0 Credits. Class-2.0. Clinical-0.0. Lab-2.0. Work-0.0

This course introduces destructive and non-destructive testing methods. Emphasis is placed on safety, types and methods of testing, and the use of testing equipment and materials. Upon completion, students should be able to understand and/or perform a variety of destructive and non-destructive testing processes.

WLD 265. Automated Welding/Cutting. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course introduces automated welding equipment and processes. Topics include setup, programming, and operation of automated welding and cutting equipment. Upon completion, students should be able to set up, program, and operate automated welding and cutting equipment.

Prerequisites: Take all: WLD 110 and WLD 121

WLD 268. Robotic Gas Metal Arc Welding. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course provides a comprehensive overview of the tasks and responsibilities required of the robotic welding technician. Topics include robotic and welding safety, proper equipment usage and care, robotic welding programming, various automated welding applications, automated Gas Metal Arc Welding (GMAW) processes, equipment controls and settings, and weld quality. Upon completion, students should be able to set up, program, operate, and successfully run robotic gas welding equipment for various welding applications.

WLD 270. Orbital Welding TIG/Pipe. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course introduces automated tungsten inert gas (TIG) welding hardware, equipment, and processes required to apply specific, accurate, automated, and consistently repetitive pipe welds. Emphasis is placed on proper identification of automated welding process variables, how each relates to the functionality of orbital equipment and components, and how changes in variables directly influence weld quality. Upon completion, students should be able to produce quality pipe welds through the appropriate operation and control of automated TIG welding equipment.