Welding Technology

The Welding Technology curriculum provides students with a sound understanding of the science, technology and applications essential for successful employment in the welding and metal industry.

Instruction includes consumable and non-consumable electrode welding and cutting processes. Courses in math, blueprint reading, metallurgy, welding inspection and destructive and non-destructive testing provides students with industry-standard skills developed through classroom training and practical applications.

Successful graduates of the Welding Technology curriculum may be employed as entry-level technicians in welding and metal working industries. Career opportunities also exist in construction, manufacturing, fabrication, sales, quality control, supervision and welding-related self-employment.

For specific information about potential positions and wages in Welding employment, visit the Central Piedmont Career Coach (https://cpcc.emsicc.com/programs/welding-technology-academic-program-for-credit/198260?radius=&region=50%20Mile%20Radius) website.

Welding Technology (A50420)

Degree Awarded

The Associate in Applied Science - Welding Technology is awarded by the college upon completion of this program.

- Welding Technology - Construction Pipe and Heavy Maintenance Welding (A50420C) (p. 1)
- Welding Technology - Entrepreneurial Welding Business & Technical Sales (A50420E) (p. 1)
- Welding Technology - Fabrication and Manufacturing (A50420F) (p. 2)

Admissions

- Completion of a high school diploma or equivalent is required.
- Many courses have prerequisites or co-requisites. Check the Courses section for details.

Contact Information

The Welding Technology program is in the Applied Technologies Division. For more information, call the Welding Technology Program Chair at 704.330.4429 or the Applied Technologies Division at 704.330.4445.

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

General Education Requirements		
ENG 111	Writing and Inquiry	3.0
Take 3 credits of the following:		3.0
ENG 112	Writing and Research in the Disciplines	
ENG 113	Literature-Based Research	
ENG 114	Professional Research & Reporting	
Select one of the following:		3.0
MAT 110	Mathematical Measurement and Literacy	
or MAT 143	Quantitative Literacy	
Select one of the following:		
COM 110	Introduction to Communication	3.0
or COM 231	Public Speaking	
Select 3 credits of the following:		3.0
ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	
Select 3 credits of the following:		3.0
ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	
Major Requirements		
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
WLD 116	SMAW (stick) Plate/Pipe	4.0
WLD 143	Welding Metallurgy	2.0
WOL 110	Basic Construction Skills	3.0
WLD 151	Fabrication I	4.0
WLD 261	Certification Practices	2.0
WLD 122	GMAW (MIG) Plate/Pipe	3.0
or WLD 132	GTAW (TIG) Plate/Pipe	
WLD 215	SMAW (stick) Pipe	4.0
or WLD 270	Orbital Welding TIG/Pipe	
WLD 221	GMAW (MIG) Pipe	3.0
or WLD 231	GTAW (TIG) Pipe	
WLD 262	Inspection & Testing	3.0
or NDE 110	Intro to Nondestructive Examination	
Select 3 credits of the following:		3.0
CIS 110	Introduction to Computers	
CIS 111 & WBL 111	Basic PC Literacy and Work-Based Learning I	
Total Credits		67

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

General Education Requirements		
ENG 111	Writing and Inquiry	3.0

Take 3 credits of the following:		3.0
ENG 112	Writing and Research in the Disciplines	
ENG 113	Literature-Based Research	
ENG 114	Professional Research & Reporting	
Select one of the following:		
COM 110	Introduction to Communication	3.0
or COM 231	Public Speaking	
Select 3 credits of the following		3.0
ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	
Select 3 credits of the following:		3.0
ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	
Select one of the following:		
MAT 110	Mathematical Measurement and Literacy	3.0
or MAT 143	Quantitative Literacy	
Major Requirements		
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
WLD 143	Welding Metallurgy	2.0
WLD 151	Fabrication I	4.0
WOL 110	Basic Construction Skills	3.0
ELC 111	Introduction to Electricity	3.0
WLD 262	Inspection & Testing	3.0
or NDE 110	Intro to Nondestructive Examination	
WLD 265	Automated Welding/Cutting	4.0
or WLD 270	Orbital Welding TIG/Pipe	
BUS 110	Introduction to Business	3.0
BUS 137	Principles of Management	3.0
BUS 139	Entrepreneurship I	3.0
or BUS 230	Small Business Management	
Select 3 credits of the following:		3.0
CIS 110	Introduction to Computers	
CIS 111 & WBL 111	Basic PC Literacy and Work-Based Learning I	
Total Credits		67

Welding Technology - Fabrication and Manufacturing Track (A50420F)

General Education Requirements		
ENG 111	Writing and Inquiry	3.0
Take 3 credits of the following:		3.0
ENG 112	Writing and Research in the Disciplines	
ENG 113	Literature-Based Research	
ENG 114	Professional Research & Reporting	
Take 3 credits of the following:		3.0
COM 110	Introduction to Communication	
COM 231	Public Speaking	
Take 3 credits of the following:		3.0
MAT 110	Mathematical Measurement and Literacy	
MAT 143	Quantitative Literacy	
Take 3 credits of the following:		3.0
ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	
Take 3 credits of the following:		3.0
ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	
Major Requirements		
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
Other Major Requirements		
ELC 111	Introduction to Electricity	3.0
MAC 121	Introduction to CNC	2.0
WLD 132	GTAW (TIG) Plate/Pipe	3.0
WLD 143	Welding Metallurgy	2.0
WLD 151	Fabrication I	4.0
WLD 251	Fabrication II	3.0

WLD 265	Automated Welding/Cutting	4.0
WOL 110	Basic Construction Skills	3.0
WLD 262	Inspection & Testing	3.0
or NDE 110	Intro to Nondestructive Examination	
Select 4 credits from the following:		4.0
CIS 110	Introduction to Computers	
CIS 111 & WBL 111	Basic PC Literacy and Work-Based Learning I	
Total Credits		67

Welding Technology Diploma (D50420)

Diploma Awarded

A Diploma in Welding Technology is awarded by the college upon completion of this program.

Admissions

Completion of a high school diploma or equivalent is required as the foundation of a career in this area.

Contact Information

The Welding Technology program is in the Applied Technologies Division. For more information, call the Welding Technology program Cchair at 704.330.4429 or the Applied Technologies Division at 704.330.4445.

General Education Requirements		
ENG 111	Writing and Inquiry	3.0
MAT 110	Mathematical Measurement and Literacy	3.0
Major Requirements		
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
WLD 116	SMAW (stick) Plate/Pipe	4.0
WLD 122	GMAW (MIG) Plate/Pipe	3.0
WLD 132	GTAW (TIG) Plate/Pipe	3.0
WLD 221	GMAW (MIG) Pipe	3.0
WLD 231	GTAW (TIG) Pipe	3.0
WLD 151	Fabrication I	4.0
CIS 111	Basic PC Literacy	2.0
or CIS 110	Introduction to Computers	
Total Credits		46

Welding Technology Certificates (C50420)

The following certificates can be earned in the Welding Technology Program (A50420).

- Welding Technology Certificate with a Specialization in S.M.A.W. of Pipe Welding (C50420-C1) (p. 3)
- Welding Technology Certificate with a Specialization in Entry-Level Welding (C50420-C2) (p. 3)
- Welding Technology Certificate with a Specialization in Inert Gas Welding (C50420-C4) (p. 3)
- Welding Technology Certificate with a Specialization in Advanced Level Welding (C50420-C5) (p. 4)
- Welding Technology Certificate with a Specialization in Expert Level Welding (C50420-C6) (p. 4)
- Welding Technology Certificate with a Specialization in Robotic Welding and Cutting (C50420–C8) (p. 4)
- Welding Technology Certificate with a Specialization in Orbital GTAW Welding (C50420-C9) (p. 4)
- Welding Technology Certificate Specialization in G.M.A.W. of Pipe Welding (C50420-10) (p. 4)
- Welding Technology Certificate Specialization in S.M.A.W. Structure Steel Welding (C50420-11) (p. 4)
- Welding Technology Certificate Specialization in Steel Fabrication (C50420-12) (p. 4)
- Welding Technology Certificate Specialization in Advanced Welding Automation for Manufacturing (C50420-13) (p. 4)

Admissions

Completion of a high school diploma or equivalent is encouraged as the foundation of a career in this area.

Contact Information

For more information, call the Welding Technology Program Chair at 704.330.4429 or the Applied Technologies Division at 704.330.4445.

Welding Technology Certificate with a Specialization in S.M.A.W. of Pipe Welding (C50420-C1)

Major Requirements		
WLD 110	Cutting Processes	2.0
WLD 115	SMAW (Stick) Plate	5.0
WLD 141	Symbols and Specifications	3.0
WLD 116	SMAW (stick) Plate/Pipe	4.0
WLD 215	SMAW (stick) Pipe	4.0
Total Credits		18

Welding Technology Certificate with a Specialization in Entry-Level Welding (C50420-C2)

Major Requirements		
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
Total Credits		18

Welding Technology Certificate with a Specialization in Inert Gas Welding (C50420-C4)

Major Requirements		
WLD 110	Cutting Processes	2.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0

WLD 131	GTAW (TIG) Plate	4.0
WLD 141	Symbols and Specifications	3.0
Total Credits		13

Welding Technology Certificate with a Specialization in Advanced Level Welding (C50420-C5)

Major Requirements

WLD 116	SMAW (stick) Plate/Pipe	4.0
WLD 122	GMAW (MIG) Plate/Pipe	3.0
WLD 132	GTAW (TIG) Plate/Pipe	3.0
WLD 261	Certification Practices	2.0
Total Credits		12

Welding Technology Certificate with a Specialization in Expert Level Welding (C50420-C6)

Major Requirements

WLD 231	GTAW (TIG) Pipe	3.0
WLD 215	SMAW (stick) Pipe	4.0
WLD 221	GMAW (MIG) Pipe	3.0
WLD 262	Inspection & Testing	3.0
Total Credits		13

Welding Technology Certificate with a Specialization in Robotic Welding and Cutting (C50420–C8)

Major Requirements

WLD 141	Symbols and Specifications	3.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0
WLD 110	Cutting Processes	2.0
ELC 111	Introduction to Electricity	3.0
WLD 265	Automated Welding/Cutting	4.0
Total Credits		16

Welding Technology Certificate with a Specialization in Orbital GTAW Welding (C50420-C9)

Major Requirements

WLD 141	Symbols and Specifications	3.0
WLD 110	Cutting Processes	2.0
WLD 131	GTAW (TIG) Plate	4.0
ELC 111	Introduction to Electricity	3.0
WLD 270	Orbital Welding TIG/Pipe	4.0
Total Credits		16

Welding Technology Certificate Specialization in G.M.A.W. of Pipe Welding (C50420-10)

Major Requirements

WLD 110	Cutting Processes	2.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0
WLD 141	Symbols and Specifications	3.0
WLD 122	GMAW (MIG) Plate/Pipe	3.0
WLD 221	GMAW (MIG) Pipe	3.0
Total Credits		15

Welding Technology Certificate Specialization in S.M.A.W. Structure Steel Welding (C50420-11)

Major Requirements

WLD 110	Cutting Processes	2.0
WLD 115	SMAW (Stick) Plate	5.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0
WLD 141	Symbols and Specifications	3.0
Total Credits		14

Welding Technology Certificate Specialization in Steel Fabrication (C50420-12)

Major Requirements

WLD 110	Cutting Processes	2.0
WLD 115	SMAW (Stick) Plate	5.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0
WLD 122	GMAW (MIG) Plate/Pipe	3.0
WLD 141	Symbols and Specifications	3.0
Total Credits		17

Welding Technology Certificate Specialization in Advanced Welding Automation for Manufacturing (C50420-13)

This program is also available to high school students through Career and College Promise.

Major Requirements

WLD 110	Cutting Processes	2.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0
WLD 131	GTAW (TIG) Plate	4.0
WLD 141	Symbols and Specifications	3.0
WLD 265	Automated Welding/Cutting	4.0
Total Credits		17

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 DMA 010 DMA 020 DMA 030

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 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 One: WLD 115 or 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 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: Take WLD 215 and 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 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.