Welding Technology

Credentials:

AAS	Welding Technology	60-68
Diploma	Combination Welder	47-55
Certificate	Welder Helper	2-5
	Gas Welder	4
	Arc Cutter	5
	Tack Welder	7-10
	Production Line Welder	19-20
	Arc Welder	24-25
	Pipeline Welder	29-40
	AWS National Skills Standards Level I	33-34
	Shielded Metal Arc Welder	17-18
	Gas Metal Arc Welder	15-18
	Gas Tungsten Arc Welder	17-18

Description:
The Welding Technology Program is dedicated to welding education, technology and student success. Students in this program will learn various welding techniques, careers and the skills needed to be successful in the Welding Technology field. Welding occupations are primarily concerned with joining, surfacing, or repairing structures or parts made of metal or other weldable materials. The skills and knowledge needed to determine the appropriate welding technique required for a specific project and to successfully perform that technique are gained through course work and practical experience. The program offers a wide range of credentials including the Associate in Applied Science Degree, Diploma, and eleven certificates in Welding Technology.

Implementation: Spring 2012

Competencies/Student Outcomes:
Competencies will be met at the level appropriate to the credential.

AAS -Welding Technology

General Education Competencies:

I. Communicate Effectively
   1. Read and listen with comprehension.
   2. Speak and write clearly using standard English.
   3. Interact cooperatively with others using both verbal and non-verbal means.
   4. Demonstrate information processing through basic computer skills.

II. Think Critically
   1. Make connections in learning across the disciplines and draw logical conclusions.
   2. Demonstrate problem solving through interpreting, analyzing, summarizing, and/or integrating a variety of materials.
   3. Use mathematics to organize, analyze, and synthesize data to solve a problem.

III. Learn Independently
   1. Use appropriate search strategies and resources to find, evaluate, and use information.
   2. Make choices based upon awareness of ethics and differing perspectives/ideas.
   3. Apply learning in academic, personal, and public situations.
   4. Think creatively to develop new ideas, processes, or products.

IV. Examine Relationships in Diverse and Complex Environments
   1. Recognize the relationship of the individual to human heritage and culture.
   2. Demonstrate an awareness of the relationship of the individual to the biological and physical environment.

3. Develop an awareness of self as an individual member of a multicultural global community.

Technical Competencies:

1. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; identify, select, and store GTAW electrodes and filler rods.
2. Explain the principles of GTAW and the effects of variables on the GTAW process.
3. Explain the theory and application of Plasma Arc Cutting.
4. Demonstrate the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, on plate with both ferrous and non-ferrous metals.
5. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) machines; identify, select, and store GMAW electrodes.
6. Explain principles of GMAW and the effects of variables on the GMAW process.
7. Explain the theory and applications of GMAW and related processes such as Flux Core Arc Welding (FCAW) and Submerged Arc Welding (SAW) and metallurgy.
8. Demonstrate the manipulative skills of Gas Metal Arc Welding on ferrous and non-ferrous metal and on joint designs on plate in all positions, including the welding of groove welds.
9. Explain and read occupationally-specific prints for welders and fabricate from a blueprint.
10. Explain the certification process in welding.
11. Test to certification standards on all types of welding.
12. Demonstrate a working knowledge of materials used in welding.
13. Demonstrate a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
14. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
15. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.
16. Demonstrate the manipulative skills to perform fillet welds in all positions.
17. Demonstrate the manipulative skills to perform groove welds in all positions.
18. Practice safety procedures for all types of welding.

Diploma - Combination Welder

Upon completion of this program, the graduate can:
Competencies will be met at the level appropriate to the credential.

General Education Competencies:

I. Communicate Effectively
   1. Read and listen with comprehension.
   2. Speak and write clearly using standard English.
   3. Interact cooperatively with others using both verbal and non-verbal means.
   4. Demonstrate information processing through basic computer skills.

II. Think Critically
   1. Make connections in learning across the disciplines and draw logical conclusions.
   2. Demonstrate problem solving through interpreting, analyzing, summarizing, and/or integrating a variety of materials.
   3. Use mathematics to organize, analyze, and synthesize data to solve a problem.

III. Learn Independently
   1. Use appropriate search strategies and resources to find, evaluate, and use information.
   2. Make choices based upon awareness of ethics and differing perspectives/ideas.
   3. Apply learning in academic, personal, and public situations.
   4. Think creatively to develop new ideas, processes, or products.

IV. Examine Relationships in Diverse and Complex Environments
   1. Recognize the relationship of the individual to human heritage and culture.
   2. Demonstrate an awareness of the relationship of the individual to the biological and physical environment.
   3. Develop an awareness of self as an individual member of a multicultural global community.

Technical Competencies:

1. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; identify, select, and store GTAW electrodes and filler rods.
2. Explain the principles of GTAW and the effects of variables on the GTAW process.
3. Explain the theory and application of Plasma Arc Cutting.
4. Demonstrate the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, on plate with both ferrous and non-ferrous metals.
5. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) machines; identify, select, and store GMAW electrodes.
6. Explain principles of GMAW and the effects of variables on the GMAW process.
7. Explain the theory and applications of GMAW and related processes such as Flux Core Arc Welding (FCAW) and Submerged Arc Welding (SAW) and metallurgy.
8. Demonstrate the manipulative skills of Gas Metal Arc Welding on ferrous and non-ferrous metal and on joint designs on plate in all positions, including the welding of groove welds.
9. Explain and read occupationally specific prints for welders and fabricate from a blueprint.
10. Explain the certification process in welding.
11. Test to certification standards on all types of welding.
12. Demonstrate a working knowledge of materials used in welding.
13. Demonstrate a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
14. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
15. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.
16. Demonstrate the manipulative skills to perform fillet welds in all positions.
17. Demonstrate the manipulative skills to perform groove welds in all positions.
18. Practice safety procedures for all types of welding.

Certificate - Welder Helper

Upon completion of this program, the graduate can:

1. Explain welding safety.
2. Describe the selection, care, and storage of Oxy-Fuel cutting equipment.
3. Explain the Identification, selection, and storage of SMAW electrodes.
4. Apply principles of SMAW process to cutting welding metals.
5. Describe the set up and use of SMAW welders.
6. Explain the application of basic metallurgy principles to control chemical, physical, and mechanical properties of carbon steel.
7. Explain the proper use of shop equipment and tools.
8. Explain the set up and use of MIG welders.
9. Explain the set up and use of TIG welders.

Certificate - Gas Welder

Upon completion of this program, the graduate can:

1. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
2. Gain a working knowledge of materials used in welding.

Certificate - Arc Cutter

Upon completion of this program, the graduate can:

1. Explain the theory and application of Plasma Arc Cutting.
2. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
3. Gain a working knowledge of materials used in welding.

Certificate - Tack Welder

Upon completion of this program, the graduate can:

1. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; as well as identify, select, and store GTAW electrodes and filler rods.
2. Explain the principles of GTAW and the effects of variables on the GTAW process.
3. Explain the theory and application of Plasma Arc Cutting.
4. Acquire the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, on plate with both ferrous and non-ferrous metals.

OR

1. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) machines; as well as identify, select, and store GMAW electrodes.
2. Explain principles of GMAW and the effects of variables on the GMAW process.

OR

1. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
2. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.

AND

1. Explain and read occupationally specific prints for welders and fabricate from a blueprint.
2. Gain a working knowledge of materials used in welding.
3. Learn and practice safety procedures for all types of welding.

Certificate - Production Line Welder

Upon completion of this program, the graduate can:

1. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
2. Gain a working knowledge of materials used in welding.
3. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; as well as identify, select, and store GTAW electrodes and filler rods.
4. Explain the principles of GTAW and the effects of variables on the GTAW process.
5. Explain the theory and application of Plasma Arc Cutting.
6. Acquire the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, on plate with both ferrous and non-ferrous metals.
7. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) machines; as well as identify, select, and store GMAW electrodes.
8. Explain principles of GMAW and the effects of variables on the GMAW process.
9. Gain a working knowledge of materials used in welding.
10. Learn and practice safety procedures for all types of welding.
11. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
12. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.

Certificate - Arc Welder

Upon completion of this program, the graduate can:

1. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
2. Gain a working knowledge of materials used in welding.
3. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; as well as identify, select, and store GTAW electrodes and filler rods.
4. Explain the principles of GTAW and the effects of variables on the GTAW process.
5. Explain the theory and application of Plasma Arc Cutting.
6. Acquire the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, on plate with both ferrous and non-ferrous metals.
7. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) machines; as well as identify, select, and store GMAW electrodes.
8. Explain principles of GMAW and the effects of variables on the GMAW process.

9. Explain and read occupationally specific prints for welders and fabricate from a blueprint.
10. Gain a working knowledge of materials used in welding.
11. Learn and practice safety procedures for all types of welding.
12. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
13. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.

Certificate - Pipeline Welder

Upon completion of this program, the graduate can:

1. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; as well as identify, select, and store GTAW electrodes and filler rods.
2. Explain the principles of GTAW and the effects of variables on the GTAW process.
3. Explain the theory and application of Plasma Arc Cutting.
4. Acquire the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, on plate with both ferrous and non-ferrous metals.
5. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) machines; as well as identify, select, and store GMAW electrodes.
6. Explain principles of GMAW and the effects of variables on the GMAW process.
7. Acquire the manipulative skills of Gas Metal Arc Welding on ferrous and non-ferrous metal and on joint designs on plate in all positions, including the welding of groove welds.
8. Explain and read occupationally specific prints for welders and fabricate from a blueprint.
9. Explain the certification process in welding.
10. Test to certification standards on all types of welding.
11. Gain a working knowledge of materials used in welding.
12. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
13. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
14. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.
15. Acquire the manipulative skills to perform fillet welds in all positions.
16. Acquire the manipulative skills to perform groove welds in all positions.
17. Learn and practice safety procedures for all types of welding.

Certificate - AWS National Skills Standards Level I

Upon completion of this program, the graduate can:

1. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; as well as identify, select, and store GTAW electrodes and filler rods.
2. Explain the principles of GTAW and the effects of variables on the GTAW process.
3. Explain the theory and application of Plasma Arc Cutting.
4. Acquire the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, and on plate with both ferrous and non-ferrous metals.
5. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) machines; as well as identify, select, and store GMAW electrodes.
6. Explain principles of GMAW and the effects of variables on the GMAW process.
7. Acquire the manipulative skills of Gas Metal Arc Welding on ferrous and non-ferrous metal and on joint designs on plate in all positions, including the welding of groove welds.
8. Explain and read occupationally specific prints for welders and fabricate from a blueprint.
9. Explain the certification process in welding.
10. Test to certification standards on all types of welding.
11. Gain a working knowledge of materials used in welding.
12. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
13. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
14. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.
15. Acquire the manipulative skills to perform fillet welds in all positions.
16. Acquire the manipulative skills to perform groove welds in all positions.

17. Learn and practice safety procedures for all types of welding.

Certificate – Shielded Metal Arc Welder

Upon completion of this program, the graduate can:

1. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting.
2. Gain a working knowledge of materials used in welding.
3. Explain and read occupationally specific prints for welders and fabricate from a blueprint.
4. Learn and practice safety procedures for all types of welding.
5. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
6. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.

Certificate – Gas Metal Arc Welder

Upon completion of this program, the graduate can:

1. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting.
2. Gain a working knowledge of materials used in welding.
3. Explain and read occupationally specific prints for welders and fabricate from a blueprint.
4. Learn and practice safety procedures for all types of welding.
5. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) electrodes.
6. Explain the principles of GMAW and the effects of variable on the GMAW process to weld plate and pipe.

Certificate – Gas Tungsten Arc Welder

Upon completion of this program, the graduate can:

1. Gain a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
2. Gain a working knowledge of materials used in welding.
3. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; as well as identify, select, and store GTAW electrodes and filler rods.
4. Explain the principles of GTAW and the effects of variables on the GTAW process.
5. Explain the theory and application of Plasma Arc Cutting.
6. Acquire the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, on plate with both ferrous and non-ferrous metals.
7. Explain and read occupationally-specific prints for welders and fabricate from a blueprint.

Outlines:

AAS
Welding Technology

ENG	101	Writing I	3
MAT	110	Applied Mathematics OR	3
MAT	116	Technical Mathematics OR	(3)
MAT	146	Contemporary College Mathematics OR	(3)
MAT	150	College Algebra OR	(3)
MA	109	College Algebra	(3)
		Heritage/Humanities	3
		Natural Sciences OR	3
		Recommended courses of:	
PHY	151	Introductory Physics I AND	(3)
PHY	161	Introductory Physics Lab I	(1)
PSY	110	General Psychology OR	3
SOC	101	Introduction to Sociology	(3)

COM	252	Introduction to Interpersonal Communication OR	3
COM	181	Basic Public Speaking	(3)
		General Education Total Credits	**18 -19**

Required

		Computer Literacy	0-3
WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Processes	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
WLD	120	Shielded Metal Arc Welding (SMAW)	2
WLD	121	Shielded Metal Arc Welding (SMAW) Fillet Lab	3
WLD	123	Shielded Metal Arc Welding (SMAW) Groove with Backing Lab OR	3
WLD	225	Shielded Metal Arc Welding (SMAW) Open Groove Lab	(3)
WLD	130	Gas Tungsten Arc Welding (GTAW)	2
WLD	131	Gas Tungsten Arc Welding (GTAW) Fillet Lab	3
WLD	133	Gas Tungsten Arc Welding (GTAW) Groove Lab	3
WLD	140	Gas Metal Arc Welding (GMAW)	2
WLD	141	Gas Metal Arc Welding (GMAW) Fillet Lab	3
WLD	143	Gas Metal Arc Welding (GMAW) Groove Lab	3
WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
WLD	220	Welding Certification	2
WLD	221	Welding Certification Lab	3
WLD	298	Welding Practicum OR	1 - 4
WLD	299	Cooperative Work Experience	(1- 4)
		Technical Electives	3
		Subtotal	**42 - 49**
		Total Credits	**60 – 68**

NOTE: Computer literacy must be demonstrated either by competency exam or by successfully completing a computer literacy course.

Diploma
Combination Welder

ENG	101	Writing I OR	3
TEC	200	Technical Communications	(3)
MAT	110	Applied Mathematics OR	3
MAT	116	Technical Mathematics OR	(3)
MAT	146	Contemporary College Mathematics OR	(3)
MAT	150	College Algebra OR	(3)
MAT	109	College Algebra	(3)
		General Education Total Credits	**6**

Required

		Computer Literacy	0-3
WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Processes	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
WLD	120	Shielded Metal Arc Welding (SMAW)	2
WLD	121	Shielded Metal Arc Welding (SMAW) Fillet Lab	3
WLD	123	Shielded Metal Arc Welding (SMAW) Groove with Backing Lab OR	3

WLD	225	Shielded Metal Arc Welding (SMAW) Open Groove Lab	(3)
WLD	130	Gas Tungsten Arc Welding (GTAW)	2
WLD	131	Gas Tungsten Arc Welding (GTAW) Fillet Lab	3
WLD	133	Gas Tungsten Arc Welding (GTAW) Groove Lab	3
WLD	140	Gas Metal Arc Welding (GMAW)	2
WLD	141	Gas Metal Arc Welding (GMAW) Fillet Lab	3
WLD	143	Gas Metal Arc Welding (GMAW) Groove Lab	3
WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
WLD	220	Welding Certification	2
WLD	221	Welding Certification Lab	3
WLD	298	Welding Practicum OR	1-4
WLD	299	Cooperative Work Experience	(1-4)
		Technical Elective	2-3
		Subtotal	**41-49**
		Total Credits	**47-55**

NOTE: Computer literacy must be demonstrated either by competency exam or by successfully completing a computer literacy course.

***Technical Electives:**

WPP	200	Workplace Principles	3
WLD	151	Basic Welding A	2
WLD	161	Submerged Arc Welding Lab	1
WLD	181	Advanced Welding Systems Lab	1
WLD	191	Plasma Arc Welding Systems Lab	1
WLD	147	Flux Cored Arc Welding Lab	1
WLD	145	Gas Metal Arc Welding Aluminum Lab	1
WLD	251	Welding Automation Lab	1
WLD	253	Pipe Fitting and Template Development Lab	1
WLD	229	Shielded Metal Arc Welding Pipe Lab B	3
WLD	239	Orbital Tube Welding	1
WLD	240	Materials Technology	2
BEX	100	Basic Electricity for Non-Majors	3
BEX	101	Basic Electricity Lab for Non-Majors	2
FEX	100	Fundamentals of Electricity for Non-Majors	3

*This list is not all inclusive. Other courses may be approved at the discretion of the program coordinator.

Certificate
Welder Helper

WLD	151	Basic Welding A OR	2
WLD	120	Shielded Metal Arc Welding (SMAW) AND	(2)
WLD	121	Shielded Metal Arc Welding (SMAW) Fillet Lab OR	(3)
WLD	130	Gas Tungsten Arc Welding (GTAW) AND	(2)
WLD	131	Gas Tungsten Arc Welding (GTAW) Fillet Lab OR	(3)
WLD	140	Gas Metal Arc Welding (GMAW) AND	(2)
WLD	141	Gas Metal Arc Welding (GMAW) Fillet Lab OR	(3)
WLD	152	Basic Welding B OR	(5)
IMT	100	Welding for Maintenance AND	(3)
IMT	101	Welding for Maintenance Lab	(2)
		Total Credits	**2-5**

Gas Welder

WLD	100	Oxy-Fuel Systems	2
WLD	101	Oxy-Fuel Systems Lab	2
		Total Credits	**4**

ARC Cutter

WLD	110	Cutting Processes	2
WLD	111	Cutting Processes Lab	3
		Total Credits	**5**

Tack Welder

WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
WLD	151	Basic Welding A OR	2
WLD	120	Shielded Metal Arc Welding (SMAW) AND	(2)
WLD	121	Shielded Metal Arc Welding (SMAW) Fillet Lab OR	(3)
WLD	130	Gas Tungsten Arc Welding (GTAW) AND	(2)
WLD	131	Gas Tungsten Arc Welding (GTAW) Fillet Lab OR	(3)
WLD	140	Gas Metal Arc Welding (GMAW) AND	(2)
WLD	141	Gas Metal Arc Welding (GMAW) Fillet Lab OR	(3)
WLD	152	Basic Welding B	(5)
		Total Credits	**7-10**

Production Line Welder

WLD	130	Gas Tungsten Arc Welding (GTAW)	2
WLD	131	Gas Tungsten Arc Welding (GTAW) Fillet Lab	3
WLD	140	Gas Metal Arc Welding (GMAW)	2
WLD	141	Gas Metal Arc Welding (GMAW) Fillet Lab	3
WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Processes	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
WLD	120	Shielded Metal Arc Welding (SMAW)	2
WLD	121	Shielded Metal Arc Welding (SMAW) Fillet Lab	3
		Total Credits	**19-20**

ARC Welder

WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Processes	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
WLD	120	Shielded Metal Arc Welding (SMAW)	2
WLD	121	Shielded Metal Arc Welding (SMAW) Fillet Lab OR	3
WLD	123	Shielded Metal Arc Welding (SMAW) Groove with Backing Lab OR	(3)
WLD	225	Shielded Metal Arc Welding (SMAW) Open Groove Lab	(3)
WLD	130	Gas Tungsten Arc Welding (GTAW)	2
WLD	131	Gas Tungsten Arc Welding (GTAW) Fillet Lab OR	3
WLD	133	Gas Tungsten Arc Welding (GTAW) Groove Lab	(3)
WLD	140	Gas Metal Arc Welding (GMAW)	2
WLD	141	Gas Metal Arc Welding (GMAW) Fillet Lab OR	3

WLD	143	Gas Metal Arc Welding (GMAW) Fillet Groove Lab	(3)
WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
		Total	**24-25**

Pipeline Welder

WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Processes	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
WLD	120	Shielded Metal Arc Welding (SMAW)	2
WLD	130	Gas Tungsten Arc Welding (GTAW)	2
WLD	140	Gas Metal Arc Welding (GMAW)	2
WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
WLD	220	Welding Certification	2
WLD	221	Welding Certification Lab	3
WLD	227	Shielded Metal Arc Welding (SMAW) Pipe Lab A	3
WLD	235	Gas Tungsten Arc Welding (GTAW) Pipe Lab A	3
WLD	245	Gas Metal Arc Welding (GMAW) Pipe Lab A	3

Recommended Electives:

WLD	229	Shielded Metal Arc Welding (SMAW) Pipe Lab B	(3)
WLD	237	Gas Tungsten Arc Welding (GTAW) Pipe Lab B	(3)
WLD	247	Gas Metal Arc Welding (GMAW) Pipe Lab B	(3)
WLD	253	Pipe Fitting and Template Development Lab	(1)
		Total	**29-40**

AWS National Skills Standards Level I

WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Processes	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
WLD	120	Shielded Metal Arc Welding (SMAW)	2
WLD	121	Shielded Metal Arc Welding (SMAW) Fillet Lab	3
WLD	123	Shielded Metal Arc Welding (SMAW) Groove with Backing Lab OR	3
WLD	225	Shielded Metal Arc Welding (SMAW) Open Groove Lab	(3)
WLD	130	Gas Tungsten Arc Welding (GTAW)	2
WLD	131	Gas Tungsten Arc Welding (GTAW) Fillet Lab	3
WLD	133	Gas Tungsten Arc Welding (GTAW) Groove Lab	3
WLD	140	Gas Metal Arc Welding (GMAW)	2
WLD	141	Gas Metal Arc Welding (GMAW) Fillet Lab	3
WLD	143	Gas Metal Arc Welding (GMAW) Fillet Groove Lab	3
WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
		Total	**33-34**

Shielded Metal Arc Welding

WLD	120	Shielded Metal Arc Welding (SMAW)	2
WLD	121	Shielded Metal Arc Welding (SMAW) Fillet Lab	3
WLD	123	Shielded Metal Arc Welding (SMAW) Groove	

		with Backing Lab OR	3
WLD	225	Shielded Metal Arc Welding (SMAW) Open Groove Lab	(3)
WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Process	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
		Total	**17-18**

Gas Metal Arc Welding

WLD	140	Gas Metal Arc Welding (GMAW)	2
WLD	141	Gas Metal Arc Welding (GMAW) Fillet Lab	3
WLD	143	Gas Metal Arc Welding (GMAW) Groove Lab OR	3
WLD	245	Gas Metal Arc Welding (GMAW) Pipe Lab A OR	(3)
WLD	147	Flux Cored Arc Welding (FCAW) Lab	(1)
WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Process	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
		Total	**15-18**

Gas Tungsten Arc Welding

WLD	130	Gas Tungsten Arc Welding (GTAW)	2
WLD	131	Gas Tungsten Arc Welding (GTAW) Fillet Lab	3
WLD	133	Gas Tungsten Arc Welding (GTAW) Groove Lab OR	3
WLD	235	Gas Tungsten Arc Welding (GTAW) Pipe Lab A	(3)
WLD	170	Blueprint Reading for Welding	2
WLD	171	Blueprint Reading for Welding Lab	3
WLD	100	Oxy-Fuel Systems OR	2
WLD	110	Cutting Process	(2)
WLD	101	Oxy-Fuel Systems Lab OR	2
WLD	111	Cutting Processes Lab	(3)
		Total	**17-18**

Dates of Actions:

Approved: March 2004

Revised: May 2007, October 2008, February 2011