

Welding

Career Cluster Description: The manufacturing career cluster prepares learners to enter an industry which includes planning, managing, and performing the processing of materials into intermediate or final products. Additional related professional and technical support activities such as production planning and control, maintenance, and manufacturing process engineering are also included in this cluster.

Major Options

- Welder/Fabricator
- Career & Technology Teacher
- Sheet Metal Worker
- Process Control Technician
- Boilermaker
- Pipe Fitters
- Machinist
- Industrial Maintenance Worker
- Heavy Equipment Mechanic
- Manufacturing Engineer
- Industrial Engineer
- Structural Steel Worker

Grade 9		Grade 10		Grade 11		Grade 12	
S1	S2	S1	S2	S1	S2	S1	S2
English 1	English 1	English 2	English 2	English Elective	English Elective	English Elective	English Elective
Physical Science	Physical Science	Biology	Biology	Science Elective	Science Elective	Science Elective	Science Elective
Civics	Health	World History	World History	U.S. History	U.S. History	U.S. Govern.	AK History
Algebra I	Algebra I	Geometry	Geometry	Algebra 2	Algebra 2	Advanced Math	Advanced Math
P.E.	P.E.	Elective	Elective	Personal Finance*	Elective	Co-op Work Experience	Co-op Work Experience
Intro to Pathways	Customer Service	Small Engines 1	Small Engines 2	Welding 1*	Welding 1*	Welding 2*	Welding 2*
Technical Applications 1*	Elective	Technical Drafting 1	Technical Drafting 2	Welding 1*	Welding 1*	Welding 2*	Welding 2*
Work-Based Learning Opportunities				Career-Technical Student Organizations (CTSO)		Certifications	
<ul style="list-style-type: none"> • Apprenticeship • Cooperative Education • Job Shadowing 		<ul style="list-style-type: none"> • Paid/Unpaid Internship • School-Based Enterprise • Service Learning 		<ul style="list-style-type: none"> • Skills USA 		<ul style="list-style-type: none"> • AWS Level 1 Certified Welder 	

POSTSECONDARY OPTIONS

Two-Year College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Certifications	Licenses, On The Job Training, Training Certificates, etc.
<ul style="list-style-type: none"> • Welder/Fabricator • Pattern And Model Maker • Electrical Engineering Tech 	Department of Labor and Workforce Development, Office of Apprenticeship, email apprenticeship@alaska.gov or your local Alaska Job Center staff who will help you identify apprenticeable occupations and help you prepare for your future. You may also call (877) 724-2539	<ul style="list-style-type: none"> • Civil, Mechanical, or Electrical Engineers • Manufacturing Engineer • Teacher • Industrial Production Manager 	<ul style="list-style-type: none"> • American Welding Society Level 1 Certified Welder • American Welding Society Level 2 Certified Welder 	<ul style="list-style-type: none"> • Entrepreneurs • Process Control Technician • Machine Tool Operators • Inspectors

*College Credits may be available. [Click here for details.](#)

CTE Course Description and Standards Crosswalk

Course Information

Course Name	Welding Technology Services 1 Semester 1
Course Number	86311
Number of High School Credits	1
Sequence or CTEPS (You must first have the Sequence or CTEPS entered into the EED-CTE system.)	Welder
Date of district Course Revision	September 2014

Career & Technical Student Organization (CTSO)

CTSO embedded in this sequence	Skills USA
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Occupational Standards

Source of Occupational Standards	American Welding Society (AWS)
Names/Numbers of Occupational Standards	Certified Welder -AWS

Registration Information

Course Description (brief paragraph – as shown in your student handbook or course list)	Welding Part 1 covers the basic theory and operations of welding. The basic operations of welding include safety and health, tools and equipment (handling and care of), OAW (oxy-acetylene welding), OAC (oxy-acetylene cutting), SMAW (shielding metal arc welding), GMAW (gas metal arc welding), GTAW (gas tungsten arc welding), PAC (plasma arc cutting). The course also covers general techniques with basic blueprinting and metallurgy. This course lays the groundwork for knowledge and skills necessary to pass the AWS (American Welding Society) Level 1 certification written test and welds.
Instructional Topic Headings (please separate each heading by a semi-colon)	Overall Welding Safety; Tools, Equipment and Repair; Base and Filler Metal Identification and Selection; OAW Welding Process and Variables; OAC Process and Variables; SMAW Welding Process and Variables; GMAW Welding Process and Variables; GTAW Welding Process and Variables; PAC Process and Variables; Basic Blueprint Reading and Metallurgy; Career Employability Information; Encourage Career and Technical Student Organizations (CTSO)—SkillsUSA; AWS Entry Level Welder Certification

Summative Assessments and Standards

Technical Skills Assessment (TSA)	Yes
Course addresses:	Automated Manufacturing Technology, Welding Level 1 – Base Metal Preparation Module 29103-03, Joint Fit-up and Alignment – Module 29109-03, Oxyfuel cutting – Module 29102-03, SNAW – Beads and Fillet Welds – Module 29107-03, Electrodes and Selection – Module 29106-03, Equipment and Setup – Module 29105-03, Groove Welds with Backing – Module 29108-03, SMAW – Open V-Groove Welds – Module 29110-03, SMAW – Open-Root Pipe Welds – Module 29111-03, Weld Quality – Module 29104-03, Welding Safety – Module 29101-03,
New Alaska ELA and Math Standards	Yes
Alaska Cultural Standards	Yes

DISTRICT NAME: Mat-Su Borough School District

All Aspects of Industry (AAI)	Yes
Core Technical Standards	Yes
Employability Standards	Yes
Employability Standards	
Source of Employability Standards	State of Alaska
Tech Prep	
Current Tech Prep Articulation Agreement? (Y/N)	Yes
Date of Current Agreement	May 15, 2013
Postsecondary Institution Name	University of Alaska Anchorage
Postsecondary Course Name	Gas and Arc Welding (Welding Part 1 only); Shield Metal Arc Welding & Gas Metal Arc Welding (Welding Part 1 & 2 together)
Postsecondary Course Number	WELD A101; WELD A112 & WELD A161
# of Postsecondary Credits	12 (combined with Welding 2), 4 for only Welding 1

Additional CTE Course Information

Author	
Course developed by	Gilbert Campbell, Bryan Kirby, Ben Parker, Dan Trotter
Course adapted from	MSBSD Previous Welding Course
Date of previous course revision	2007
Course Delivery Model	
Is the course brokered through another institution or agency? (Y/N)	No

Standards Alignment

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/Career Readiness Standards	All Aspects of Industry/Systems	Assessment
Identify safe welding procedures.	AWS Ex 1.2.1	MN3 MN-HSE 1,2 CRP 1, 2, 3, 5, 8, 9	RI.11-12.1 -4, RST.11-12.1-3; 7	S-ID.9 S-IC.1,3,5,6 S-MD.6,7	A1 B2, B4	A2, A5, A6	Health/Safety	State of AK DEED Safety test
Identify safe and efficient use of tools and equipment.	AWS Ad 1.6.4	MN3 MN-HSE1-7 MNPPD 3 MN-PPD 5 MN-MIR 1-7 CRP 1, 2, 3, 5, 8, 9	RI.11-12.1 -4, RST.11-12.1-3; 7	S-ID.9 S-IC.1,3,5,6 S-MD.6,7	A1 B2, B4	A2, A5, A6	Health/Safety Technical Skills	Certified Welder Exam through AWS Student has to demo and explain safe use

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/Career Readiness Standards	All Aspects of Industry/Systems	Assessment
Develop proficiency in OAC, PAC.	AWS 1.4.1	MN-PPD 1-5 CRP 2, 3, 6, 8, 9, 10	RST.11- 12.1-3, 7, 9	G-SRT.8 G- GMD.1,3,4 G- MG.1,2,3	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce quality weld or cut from weld schedule Written test
Develop understanding in SMAW, GMAW, GTAW processes.	AWS 1.3.7	MN-PPD 1-5 CRP 1,2,3,5,8,9	RST.11- 12.1-3, 7, 9	G-SRT.8 G- GMD.1,3,4 G- MG.1,2,3	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce quality weld from weld schedule. Written test.
Understand base and filler metal properties.	AWS Ad18a	MN-PPD 1-5 CRP1,2,3,5, 8,9	RST.9- 10.3-5, 8	S-IC.5,6	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/ Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
								Written Test
Identify career opportunities.	AWS NCDG 2.06H, 3.09D	MN 4 CRP2,3,6,8, 9,10	W.11- 12.4, 5, 6 SL.9-10. 4- 5, L.11-12. 1- 3, 6	S-IC.6 S-CP.5	A1 B2, B4	A2, A3, A5, B1, B2, B3, B4, B5	Planning Community Labor	Resume and electronic portfolio creation from AKCIS.
Read basic blueprints and discuss metallurgy.	AWS Ex 1.1.7d	STET 4 CRP2,7,11	RST.9-10. 7 RST.11- 12.1-4 RST.11- 12.7-9	N-Q.1 N-CN.4,5,6 G-CO.1-13 G-SRT.8	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Written Test Project from blueprint.
Prepare for SkillsUSA technical and leadership competitions.		MN-PPD-5 MN 6 CRP 1 - 12	RST.11- 12.1-4, 7- 9 W.11- 12.4, 5, 6 SL.9-10. 4- 5, L.11-12. 1- 3, 6 RST.9- 10.3-5, 8 W.11-	N-VM8 G- GMD.1,3,4 G-MG1,2,3 S-IC.6 S-CP.5 N-Q.1 N-CN.4,5,6 G-CO.1-13 G-SRT.8	A1 B2, B4	A2, A3, A5, B1, B2, B3, B4, B5	Work Habits Planning Community	Participation in Student Performanc e Conference. SkillsUSA Assessment Test

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/Career Readiness Standards	All Aspects of Industry/Systems	Assessment
			12.4, 5, 6 SL.9-10. 4-5, L.11-12. 1-3, 6					
Select appropriate AWS certification.	AWS Ad 1/2J	CRP 1,2,8,10,11	RST.11-12.1-4, 7-9 W.11-12.4, 5, 6 SL.9-10. 4-5, L.11-12. 1-3, 6 RST.9-10.3-5, 8	N-VM8 G- GMD.1,3,4 G-MG1,2,3 S-IC.6 S-CP.5 N-Q.1 N-CN.4,5,6 G-CO.1-13 G-SRT.8	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Hands-On Performance Test.

Instructional Resources

List the major instructional resources used for this course: (websites, textbooks, essential equipment, reference materials, supplies)

Recommended Text: Welding Technology, Bowditch, Goodheart-Willcox, 1997.

Resources:

American Welding Society AWS D1.1 Structural Welding Code

American Petroleum Institute API 1104

Hobart Institute of Welding Technology Training Workbooks, SMAW, GTAW, GMAW, OAW, FCAW, 1997, www.welding.org

CTE Course Description and Standards Crosswalk

Course Information

Course Name	Welding Technology Services 1 Semester 2
Course Number	86312
Number of High School Credits	1
Sequence or CTEPS (You must first have the Sequence or CTEPS entered into the EED-CTE system.)	Welder
Date of district Course Revision	September 2014

Career & Technical Student Organization (CTSO)

CTSO embedded in this sequence	Skills USA
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Occupational Standards

Source of Occupational Standards	American Welding Society (AWS)
Names/Numbers of Occupational Standards	Certified Welder –AWS

Registration Information

Course Description (brief paragraph – as shown in your student handbook or course list)	Welding Part 1 covers the basic theory and operations of welding. The basic operations of welding include safety and health, tools and equipment (handling and care of), OAW (oxy-acetylene welding), OAC (oxy-acetylene cutting), SMAW (shielding metal arc welding), GMAW (gas metal arc welding), GTAW (gas tungsten arc welding), PAC (plasma arc cutting). The course also covers general techniques with basic blueprinting and metallurgy. This course lays the groundwork for knowledge and skills necessary to pass the AWS (American Welding Society) Level 1 certification written test and welds.
Instructional Topic Headings (please separate each heading by a semi-colon)	Overall Welding Safety; Tools, Equipment and Repair; Base and Filler Metal Identification and Selection; OAW Welding Process and Variables; OAC Process and Variables; SMAW Welding Process and Variables; GMAW Welding Process and Variables; GTAW Welding Process and Variables; PAC Process and Variables; Basic Blueprint Reading and Metallurgy; Career Employability Information; Encourage Career and Technical Student Organizations (CTSO)—SkillsUSA; AWS Entry Level Welder Certification

Summative Assessments and Standards

Technical Skills Assessment (TSA)	Yes
Course addresses:	Automated Manufacturing Technology, Welding Level 1 – Base Metal Preparation Module 29103-03, Joint Fit-up and Alignment – Module 29109-03, Oxyfuel cutting – Module 29102-03, SNAW – Beads and Fillet Welds – Module 29107-03, Electrodes and Selection – Module 29106-03, Equipment and Setup – Module 29105-03, Groove Welds with Backing – Module 29108-03, SMAW – Open V-Groove Welds – Module 29110-03, SMAW – Open-Root Pipe Welds – Module 29111-03, Weld Quality – Module 29104-03, Welding Safety – Module 29101-03,
New Alaska ELA and Math Standards	Yes
Alaska Cultural Standards	Yes

DISTRICT NAME: Mat-Su Borough School District

All Aspects of Industry (AAI)	Yes
Core Technical Standards	Yes
Employability Standards	Yes
Employability Standards	
Source of Employability Standards	State of Alaska
Tech Prep	
Current Tech Prep Articulation Agreement? (Y/N)	Yes
Date of Current Agreement	May 15, 2013
Postsecondary Institution Name	University of Alaska Anchorage
Postsecondary Course Name	Gas and Arc Welding (Welding Part 1 only); Shield Metal Arc Welding & Gas Metal Arc Welding (Welding Part 1 & 2 together)
Postsecondary Course Number	WELD A101; WELD A112 & WELD A161
# of Postsecondary Credits	12 (combined with Welding 2), 4 for only Welding 1

Additional CTE Course Information

Author	
Course developed by	Gilbert Campbell, Bryan Kirby, Ben Parker, Dan Trotter
Course adapted from	MSBSD Previous Welding Course
Date of previous course revision	2007
Course Delivery Model	
Is the course brokered through another institution or agency? (Y/N)	No

Standards Alignment

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/Career Readiness Standards	All Aspects of Industry/Systems	Assessment
Demonstrate safe welding procedures.	AWS Ex 1.2.1	MN3 MN-HSE 1,2 CRP 1, 2, 3, 5, 8, 9	RI.11-12.1 -4, RST.11-12.1-3; 7	S-ID.9 S-IC.1,3,5,6 S-MD.6,7	A1 B2, B4	A2, A5, A6	Health/Safety	State of AK DEED Safety test
Utilize safe and efficient use of tools and equipment.	AWS Ad 1.6.4	MN3 MN-HSE1-7 MNPPD 3 MN-PPD 5 MN-MIR 1-7 CRP 1, 2, 3, 5, 8, 9	RI.11-12.1 -4, RST.11-12.1-3; 7	S-ID.9 S-IC.1,3,5,6 S-MD.6,7	A1 B2, B4	A2, A5, A6	Health/Safety Technical Skills	Certified Welder Exam through AWS Student has to demo and explain safe use

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/ Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Demonstrate proficiency in OAW, OAC, PAC.	AWS 1.4.1	MN-PPD 1-5 CRP 2, 3, 6, 8, 9, 10	RST.11- 12.1-3, 7, 9	G-SRT.8 G- MD.1,3,4 G-MG1.2,3	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce quality weld or cut from weld schedule Written test
Demonstrate SMAW, GMAW, GTAW processes.	AWS 1.3.7	MN-PPD 1-5 CRP 1,2,3,5,8,9	RST.11- 12.1-3, 7, 9	G-SRT.8 G- MD.1,3,4 G-MG1.2,3	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce quality weld from weld schedule. Written test.
Compare and contrast SMAW, GMAW, GTAW processes. and choose the correct process for the job.	AWS 1.3.7	MN-PPD 1-5 CRP 1,2,3,5,8,9	RST.11- 12.1-3, 7, 9	G-SRT.8 G- MD.1,3,4 G-MG1.2,3	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/ Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
								quality weld from weld schedule. Written test.
Use base and filler metal properties	AWS Ad18a	MN-PPD 1-5 CRP1,2,3,5, 8,9	RST.9-10.3-5, 8	S-IC.5,6	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Written Test
Differentiate career opportunities.	AWS NCDG 2.06H, 3.09D	MN 4 CRP2,3,6,8, 9,10	W.11-12.4, 5, 6 SL.9-10. 4-5, L.11-12. 1-3, 6	S-IC.6, S-CP.5	A1 B2, B4	A2, A3, A5, B1, B2, B3, B4, B5	Planning Community Labor	Resume and electronic portfolio creation from AKCIS.
Integrate blueprint reading with metallurgy projects	AWS Ex 1.1.7d	STET 4 CRP2,7,11	RST.9-10. 7 RST.11-12.1-4 RST.11-12.7-9	N-Q.1,2,3 N-CN.4,5,6 G-CO.1-13 G-SRT.8	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Written Test Project from blueprint.
Perform in SkillsUSA .technical and leadership competitions.		MN-PPD-5 MN 6	RST.11-12.1-4, 7-	N-VM8 G-	A1 B2, B4	A2, A3, A5, B1, B2, B3,	Work Habits	Participation in Student

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/Career Readiness Standards	All Aspects of Industry/Systems	Assessment
		CRP 1 - 12	9 W.11-12.4, 5, 6SL.9-10.4-5, L.11-12. 1-3, 6 RST.9-10.3-5, 8 W.11-12.4, 5, 6 SL.9-10. 4-5, L.11-12. 1-3, 6	MD.1,3,4 G-MG1.2,3 S-IC.6 S-CP.5 N-Q.1,2,3 N-CN.4,5,6 G-CO.1-13 G-SRT.8		B4, B5	Planning Community	Performance Conference. SkillsUSA Assessment Test
Categorize all AWS welding certification.	AWS Ad 1/2J	CRP 1,2,8,10,11	RST.11-12.1-4, 7-9 W.11-12.4, 5, 6 SL.9-10. 4-5, L.11-12. 1-3, 6 RST.9-10.3-5, 8	N-VM8 G-MD.1,3,4 G-MG1.2,3 S-IC.6 S-CP.5 N-Q.1,2,3 N-CN.4,5,6 G-CO.1-13 G-SRT.8	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Hands-On Performance Test.

Instructional Resources

DISTRICT NAME: Mat-Su Borough School District

List the major instructional resources used for this course: (websites, textbooks, essential equipment, reference materials, supplies)

Recommended Text: Welding Technology, Bowditch, Goodheart-Willcox, 1997.

Resources:

American Welding Society AWS D1.1 Structural Welding Code

American Petroleum Institute API 1104

Hobart Institute of Welding Technology Training Workbooks, SMAW, GTAW, GMAW, OAW, FCAW, 1997, www.welding.org

CTE Course Description and Standards Crosswalk

Course Information

Course Name	Welding Technology Services Part 2 Semester 1
Course Number	86321
Number of High School Credits	1
Sequence or CTEPS (You must first have the Sequence or CTEPS entered into the EED-CTE system.)	Welder
Date of district Course Revision	September 2014

Career & Technical Student Organization (CTSO)

CTSO embedded in this sequence	Skills USA
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Occupational Standards

Source of Occupational Standards	American Welding Society (AWS)
Names/Numbers of Occupational Standards	Certified Welder - AWS

Registration Information

Course Description (brief paragraph – as shown in your student handbook or course list)	Welding Part 2 covers welding safety and health, tools and equipment; continuation and advanced SMAW, GMAW, GTAW, OAW processes; introduction to FCAW (Flux Cored Arc Welding), advanced cutting processes, blueprinting and metallurgy; employability and career information explored; computer design and cutting techniques; and continued preparation for the AWS (American Welding Society) Level 1 certification.
Instructional Topic Headings (please separate each heading by a semi-colon)	Overall Welding Safety; Tools, Equipment and Repair; Advanced Base and Filler Metal Identification and Selection; Advanced (Continued) OAW Welding Process and Variables; Advanced SMAW Welding Process and Variables; Advanced GMAW Welding Process and Variables; Advanced GTAW Welding Process and Variables; Advanced Cutting Processes; Advanced Cutting Processes; Basic FCAW Processes; Computer Design and Cutting; Advanced Blueprint Reading and Metallurgy; Career Employability Information; Encourage Career and Technical Student Organizations (CTSO)—SkillsUSA; AWS Entry

Summative Assessments and Standards

Technical Skills Assessment (TSA)	Yes
Course addresses:	Welding Level 1 – Base Metal Preparation Module 29103-03, Joint Fit-up and Alignment – Module 29109-03, Oxyfuel cutting – Module 29102-03, SNAW – Beads and Fillet Welds – Module 29107-03, Electrodes and Selection – Module 29106-03, Equipment and Setup – Module 29105-03, Groove Welds with Backing – Module 29108-03, SMAW – Open V-Groove Welds – Module 29110-03, SMAW – Open-Root Pipe Welds – Module 29111-03, Weld Quality – Module 29104-03, Welding Safety – Module 29101-03,
New Alaska ELA and Math Standards	Yes
Alaska Cultural Standards	Yes

DISTRICT NAME: Mat-Su Borough School District

All Aspects of Industry (AAI)	Yes
Core Technical Standards	Yes
Employability Standards	Yes
Employability Standards	
Source of Employability Standards	State Of Alaska
Tech Prep	
Current Tech Prep Articulation Agreement? (Y/N)	Yes (Combined with Welding 1)
Date of Current Agreement	May 15, 2013
Postsecondary Institution Name	University of Alaska Anchorage
Postsecondary Course Name	Shield Metal Arc Welding & Gas Metal Arc Welding
Postsecondary Course Number	WELD A112 & WELD A161
# of Postsecondary Credits	8

Additional CTE Course Information

Author	
Course developed by	Gilbert Campbell, Bryan Kirby, Ben Parker, Dan Trotter
Course adapted from	MSBSD Previous Welding Course
Date of previous course revision	2007
Course Delivery Model	
Is the course brokered through another institution or agency? (Y/N)	No

Standards Alignment

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability / Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Understand and demonstrate safe welding procedures.	AWS Ex 1.2.1	MN3 MN-HSE 1,2 CRP 1, 2, 3, 5, 8, 9	RI 11-12 1 -4, RST 11-12 1-3; 7		A1 B2, B4	A2, A5, A6	Health/Safety	State of AK DEED Safety test
Utilize safe and efficient use of tools/equipment.	AWS Ad 1.6.4	MN3 MN-HSE1-7 MNPPD 3 MN-PPD 5 MN-MIR 1-7 CRP 1, 2, 3, 5, 8, 9	RI 11-12 1 -4, RST 11-12 1-3; 7	N-VM8	A1 B2, B4	A2, A5, A6	Health/Safety Technical Skills	Certified Welder Exam through AWS Student has to demo and explain safe use

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability / Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Develop proficiency in advanced OAW, SMAW, GTAW, GMAW processes.	AWS 1.3.7	MN-PPD 1-5 CRP 2, 3, 6, 8, 9, 10	RST 11-12.1-3, 7, 9	G-SRT.8 GMD.1,3.4	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce quality weld or cut from weld schedule. Written test
Describe and discuss basic FCAW-G processes.	AWS 1.3.2	MN-PPD 1-5 CRP 2, 3, 6, 8, 9, 10	RST 11-12.1-3, 7, 9	G-MG1.2,3	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce quality weld from weld schedule. Written test
Students will instruct welding employment opportunities in Alaska.	AWS NCDG 2.06H, 3.09D	MN 4 CRP2,3,6,8, 9,10	W 11-12.4, 5, 6 SL 9-10. 4-5, L 11-12. 1-3, 6		A1 B2, B4	A2, A3, A5, B1, B2, B3, B4, B5	Planning Community Labor	Resume and electronic portfolio creation from AKCIS

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability / Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Diagram structural steel plans for vertical construction.	AWS Ex 1.1.7d	STET 4 CRP2,7,11	RST 9-10.7 RST11-12.1-4 RST11-12.7-9		B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Written Test Project from blueprint
Utilize cnc technology for cutting techniques.	AWS 1.3.2	MN-PPD 1-5 CRP 2, 3, 6, 8, 9, 10	RST11-12.3,4,7-9		B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Design and create project.
Prepare and participate in community activities for SkillsUSA technical leadership competition.		MN-PPD-5 MN 6 CRP 1 - 12	RST 11-12.1-4, 7-9 W 11-12.4, 5, 6 SL 9-10. 4-5, L 11-12. 1-3, 6 RST 9-10.3-5, 8 W 11-	N-VM8 GMD.1,3,4 G-MG1.2,3	A1 B2, B4	A2, A3, A5, B1, B2, B3, B4, B5	Work Habits Planning Community	Participation in Student Performance Conference. SkillsUSA Assessment Test

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability / Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
			12.4, 5, 6 SL 9-10. 4-5, L 11-12. 1-3, 6					
Demonstrate adequate competency to attempt AWS welding certification test.	AWS Ad 1/2J	CRP 1,2,8,10,11	RST 11-12.1-4, 7-9 W 11-12.4, 5, 6 SL 9-10. 4-5, L 11-12. 1-3, 6 RST 9-10.3-5, 8		B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Hands-On Performance Test

Instructional Resources

List the major instructional resources used for this course: (websites, textbooks, essential equipment, reference materials, supplies)

Recommended Text: Welding Technology, Bowditch, Goodheart-Willcox, 1997.

Resources:

American Welding Society AWS D1.1 Structural Welding Code

American Petroleum Institute API 1104

Hobart Institute of Welding Technology Training Workbooks, SMAW, GTAW, GMAW, OAW, FCAW, 1997, www.welding.org

CTE Course Description and Standards Crosswalk

Course Information

Course Name	Welding Technology Services Part 2 Semester 2
Course Number	86322
Number of High School Credits	1
Sequence or CTEPS (You must first have the Sequence or CTEPS entered into the EED-CTE system.)	Welder
Date of district Course Revision	September 2014

Career & Technical Student Organization (CTSO)

CTSO embedded in this sequence	Skills USA
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Occupational Standards

Source of Occupational Standards	American Welding Society (AWS)
Names/Numbers of Occupational Standards	Certified Welder - AWS

Registration Information

Course Description (brief paragraph – as shown in your student handbook or course list)	Welding Part 2 covers welding safety and health, tools and equipment; continuation and advanced SMAW, GMAW, GTAW, OAW processes; introduction to FCAW (Flux Cored Arc Welding), advanced cutting processes, blueprinting and metallurgy; employability and career information explored; computer design and cutting techniques; and continued preparation for the AWS (American Welding Society) Level 1 certification.
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Instructional Topic Headings (please separate each heading by a semi-colon)	Overall Welding Safety; Tools, Equipment and Repair; Advanced Base and Filler Metal Identification and Selection; Advanced (Continued) OAW Welding Process and Variables; Advanced SMAW Welding Process and Variables; Advanced GMAW Welding Process and Variables; Advanced GTAW Welding Process and Variables; Advanced Cutting Processes; Advanced Cutting Processes; Basic FCAW Processes; Computer Design and Cutting; Advanced Blueprint Reading and Metallurgy; Career Employability Information; Encourage Career and Technical Student Organizations (CTSO)—SkillsUSA; AWS Entry
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Summative Assessments and Standards

Technical Skills Assessment (TSA)	Yes
Course addresses:	Welding Level 1 – Base Metal Preparation Module 29103-03, Joint Fit-up and Alignment – Module 29109-03, Oxyfuel cutting – Module 29102-03, SNAW – Beads and Fillet Welds – Module 29107-03, Electrodes and Selection – Module 29106-03, Equipment and Setup – Module 29105-03, Groove Welds with Backing – Module 29108-03, SMAW – Open V-Groove Welds – Module 29110-03, SMAW – Open-Root Pipe Welds – Module 29111-03, Weld Quality – Module 29104-03, Welding Safety – Module 29101-03,
New Alaska ELA and Math Standards	Yes
Alaska Cultural Standards	Yes

DISTRICT NAME: Mat-Su Borough School District

All Aspects of Industry (AAI)	Yes
Core Technical Standards	Yes
Employability Standards	Yes
Employability Standards	
Source of Employability Standards	State Of Alaska
Tech Prep	
Current Tech Prep Articulation Agreement? (Y/N)	Yes (Combined with Welding 1)
Date of Current Agreement	May 15, 2013
Postsecondary Institution Name	University of Alaska Anchorage
Postsecondary Course Name	Shield Metal Arc Welding & Gas Metal Arc Welding
Postsecondary Course Number	WELD A112 & WELD A161
# of Postsecondary Credits	8

Additional CTE Course Information

Author	
Course developed by	Gilbert Campbell, Bryan Kirby, Ben Parker, Dan Trotter
Course adapted from	MSBSD Previous Welding Course
Date of previous course revision	2007
Course Delivery Model	
Is the course brokered through another institution or agency? (Y/N)	No

Standards Alignment

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability / Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Modify safe welding procedures to meet new conditions	AWS Ex 1.2.1	MN3 MN-HSE 1,2 CRP 1, 2, 3, 5, 8, 9	RI 11-12 1 -4, RST 11-12 1-3; 7		A1 B2, B4	A2, A5, A6	Health/Safety	State of AK DEED Safety test
Examine safe and efficient use of tools /equipment.	AWS Ad 1.6.4	MN3 MN-HSE1-7 MNPPD 3 MN-PPD 5 MN-MIR 1-7 CRP 1, 2, 3, 5, 8, 9	RI 11-12 1 -4, RST 11-12 1-3; 7	N-VM8	A1 B2, B4	A2, A5, A6	Health/Safety Technical Skills	Certified Welder Exam through AWS Student has to demo and explain safe use

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability / Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Apply proficient procedures in advanced OAW, SMAW, GTAW, GMAW processes.	AWS 1.3.7	MN-PPD 1-5 CRP 2, 3, 6, 8, 9, 10	RST 11-12.1-3, 7, 9	G-SRT.8 GMD.1,3.4	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce quality weld or cut from weld schedule. Written test
Compare and contrast basic FCAW and FCAWG processes.	AWS 1.3.2	MN-PPD 1-5 CRP 2, 3, 6, 8, 9, 10	RST 11-12.1-3, 7, 9	G-MG1.2,3	B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Produce quality weld from weld schedule. Written test
Formulate welding business plans.	AWS NCDG 2.06H, 3.09D	MN 4 CRP2,3,6,8, 9,10	W 11-12.4, 5, 6 SL 9-10. 4-5, L 11-12. 1-3, 6		A1 B2, B4	A2, A3, A5, B1, B2, B3, B4, B5	Planning Community Labor	Resume and electronic portfolio creation from AKCIS

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability / Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Structure advanced blueprint symbols and fabricate projects that meet industry need.	AWS Ex 1.1.7d	STET 4 CRP2,7,11	RST 9-10.7 RST11-12.1-4 RST11-12.7-9		B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Written Test Project from blueprint
Critique full weld bead process with infrared high speed welding camera.	AWS 1.3.2	MN-PPD 1-5 CRP 2, 3, 6, 8, 9, 10	RST11-12.3,4,7-9		B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Design and create project.
Perform and apply SkillsUSA opening ceremony with local chamber of commerce.		MN-PPD-5 MN 6 CRP 1 - 12	RST 11-12.1-4, 7-9 W 11-12.4, 5, 6 SL 9-10. 4-5, L 11-12. 1-3, 6 RST 9-10.3-5, 8 W 11-	N-VM8 GMD.1,3.4 G-MG1.2,3	A1 B2, B4	A2, A3, A5, B1, B2, B3, B4, B5	Work Habits Planning Community	Participation in Student Performance Conference. SkillsUSA Assessment Test

DISTRICT NAME: Mat-Su Borough School District

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			12.4, 5, 6 SL 9-10. 4-5, L 11-12. 1-3, 6					
Apply and take the AWS certification test for the area of interest and or job.	AWS Ad 1/2J	CRP 1,2,8,10,11	RST 11-12.1-4, 7-9 W 11-12.4, 5, 6 SL 9-10. 4-5, L 11-12. 1-3, 6 RST 9-10.3-5, 8		B2, B4	A2, A5	Technical Skills	Certified Welder Exam through AWS Hands-On Performance Test

Instructional Resources

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Hobart Institute of Welding Technology Training Workbooks, SMAW, GTAW, GMAW, OAW, FCAW, 1997, www.welding.org

MSBSD Tech Prep Agreements				
MAT-SU COLLEGE				
MSBSD COURSES	MSBSD LOCATION	MAT-SU COLLEGE COURSE NAME	CREDIT	COST
A+	Career Tech High School	CNT A210 PC Technician Fundamentals	3 Semester	\$ 75.00
Net 1--Cisco Academy	Career Tech High School	CNT A170 Cisco Academy --Network Fundamentals	4 Semester	\$ 100.00
Net 2--Cisco Academy	Career Tech High School	CNT A261 Cisco Academy --Router Fundamentals	4 Semester	\$ 100.00
Net 3--Cisco Academy	Career Tech High School	CNT A270 Cisco Academy --Switching & Intermediate Routing	4 Semester	\$ 100.00
Net 4--Cisco Academy	Career Tech High School	CNT A271 Cisco Academy --WAN Management	4 Semester	\$ 100.00
Personal Finance (1 sem)	Colony High School Career Tech High School Houston High School Palmer High School Wasilla High School Su Valley School	BA A131 Personal Finance	3 Semester	\$ 75.00
Tech App 1, 2 & 3	Colony High School Career Tech High School Houston High School *When Tech Apps 1-3 is offered Palmer High School Joe Redington Sr. Jr/Sr High School *When Tech Apps 1-3 is offered Su Valley School *When Tech Apps 1-3 is offered Wasilla High School	CIS A105 Intro to PC Computers	3 Semester	\$ 75.00
Tech App 3	Colony High School Career Tech High School Houston High School *When Tech Apps 1-3 is offered Palmer High School Joe Redington Sr. Jr/Sr High School *When Tech Apps 1-3 is offered Su Valley School *When Tech Apps 1-3 is offered Wasilla High School	CIOS A240A Databases II: MS Access, CIOS A140A Databases I Access & CIOS A150A Power Point	4 Semester	\$ 100.00
UNIVERSITY OF ALASKA ANCHORAGE				
MSBSD COURSES	MSBSD LOCATION	UNIVERSITY OF ALASKA ANCHORAGE COURSE NAME	CREDIT	COST
AutoService Tech 1-3	Palmer High School Wasilla High School	ADT A102 Introduction to Automotive Technology	3 Semester	\$ 75.00
AutoService Tech 1-4 or Auto Electronics Tech	Palmer High School Wasilla High School	ADT A121 Auto Electrical I	3 Semester	\$ 75.00
Certified Nursing Assistant	Career & Tech High School	HCA A105 Certified Nurse Aide	8 Semester	\$ 200.00
Combination of 2 semesters of Culinary Arts 1-4	Career & Tech High School Palmer High School	CA A104 Sanitation	2 Semester	\$ 50.00
Technical Drafting 3&4 or Architectural Drafting 1&2	Colony High School Career & Tech High School Wasilla High School	AET 101 Fundamentals of CAD for Building Construction	4 Semester	\$ 100.00
Welding Part 1	Colony High School Houston High School	Weld 101 Gas & Arc Welding	4 Semester	\$ 100.00
Welding Parts 1 & 2	Colony High School Houston High School	Welding 112 Shielded Metal Arc Welding	4 Semester	\$ 100.00
Welding Parts 1 & 2	Colony High School Houston High School	Welding 161 Gas Metal Arc Welding	4 Semester	\$ 100.00
Technical Drafting 1	Colony High School Career & Tech High School Wasilla High School	ENGR A105A	1 Semester	\$40.00
Technical Drafting 2	Colony High School Career & Tech High School Wasilla High School	ENGR A105B	1 Semester	\$40.00
UNIVERSITY OF ALASKA FAIRBANKS				
MSBSD COURSES	MSBSD LOCATION	UNIVERSITY OF ALASKA FAIRBANKS COURSE NAME	CREDIT	COST
Process Technology	Career & Tech High School	PRT A101 Intro to Process Technology	3 Semester	\$ 75.00



Where a great job is done.

To whom it may concern;

I am Gary W. Feaster, the owner of Greatland Welding & Machine inc. I would like to write a letter in support of the Colony High School welding program. I was a charter member on the advisory committee when the school district started the planning stages for a welding program at Colony High.

This program has grown to become the model welding program for the state of Alaska. The instructor Dan Trotter has an outstanding ability to connect with the students, to get the most out of them, and to give them each a personal approach to the skills that they will need to be successful in this career.

This program has produced many students in the top ten of the state for the Skills USA. competition for the majority of the time that the program has been going. All of the students in this program have the chance of graduating with multiple certifications in welding.

Dan tries hard to line up employment opportunities for the students prior to their graduation. I have employed several of the students at our company over the years. The program can touch on all of the primary process' for the welding field. (i.e. GMAW, SMAW, FCAW-G, FCAW,GTAW, PAC, OFW, OFC, Brazing, Aluminum GMAW, & Aluminum GTAW) They also offer different types of weld testing at the school. (i.e. Visual, Dye penetrant and mag particle testing). Dan also holds a CWI certificate for checking the finished results of the students projects.

For many years running, there has been a waiting list to get into the program. There are pre-qualifications to being accepted into the program. This is definitely a program that should be a role model for any type of trade programs offered at any educational facility.

This program is an expensive program to facilitate, and the budgeting is very tight for the trades programs. Dan does an exceptional job of partnering with local shops and manufacturing companies to secure materials for the students to practice on. He also does different practical projects throughout the year to apply real world applications to the program.

Thank you for your time and consideration.

Gary W. Feaster

November 9th, 2017

Matanuska-Sustina Borough School District
501 N Gulkana Street
Palmer, AK 99645

To Whom It May Concern:

I am writing to on behalf of the welding programs at the high schools in our borough. Keeping funding for programs like these is critical in today's society where the value of blue collar skills are dwindling daily. For many youth this is the only avenue they have to learn a life skill that will garner them gainful employment for their future as well as provide a creative outlet that encourages students to apply problem solving skills.

As an individual that has been around the welding industry for 26 years I have seen countless students grow and flourish from these programs and go on to be productive citizens as a direct result of the skills the youth of the borough are learning in these training programs.

Sincerely,

A handwritten signature in blue ink, appearing to read "David W. Ratner", is written over a faint, light blue oval background.

David W. Ratner

