Welding Technician - Entry Level
Grades 10-12

Units of Credit: One Semester (Elective)

Prerequisite: None

Course Description:
This course offers students an opportunity to learn the fundamentals of welding technology. The content of Welding Technician – Entry Level is arranged around the four MCPS; Career and Technical Education Standards. These standards include Technical Skills and Content Knowledge, Career and Life Planning, Skills for Life and Work, and Structure of Organizations and Work. Current industry standards are introduced. Students develop and use a variety of skills including safe work habits, organization, problem solving, and practical application of welding techniques. Students engage in a variety of learning activities including lecture and note taking, research, individual projects, demonstrations, and performance tasks. Students are assessed by observing and measuring performance on tests, quizzes, assigned tasks and projects, and by the quality of work produced. Students will learn basic skills that will prepare them to apply technical knowledge and skill to current welding processes. These tasks are based on the American Welding Society (AWS) task list and the NCCER level one training manual.

Topics:
- Welding and Personal Safety
- Care and Use of Equipment
- Joint Design and Construction
- Welding Terminology
- Introduction to Oxyacetylene Welding
- Introduction to Arc Welding
- Introduction to MIG Welding
- Material Cutting Processes
- Welding Career Exploration

NOTE: Throughout this document, learning target types are identified as knowledge ("K"), reasoning ("R"), skill ("S"), or product ("P").

STANDARD 1: Students experience various career opportunities and assess personal career pathways.
Benchmark 1:
Explore and identify personal interests, aptitudes, and abilities and develop strategies to achieve tentative career goals.
Learning Targets *(Type)*:
1. I can use Montana Career Information Systems (MCIS) and/or other systems or web resources to investigate and evaluate my personal interests, aptitudes and abilities. *(S)*
2. I can formulate tentative career goals. *(R)*

3. I can evaluate approaches for meeting my goals. *(R)*
4. I can explore careers in the metal industry fields *(S,K,R)*.
5. I can prepare a resume, cover letters, and references *(K,R)*.
6. I can identify information related to welding technologies as it applies to continuing education and career decisions. *(S,K,R)*
7. I can demonstrate skills and knowledge of current equipment, materials, and processes used in related careers. *(K,S)*
8. I can recognize the career opportunities for a person with welding skills. *(K,R)*
9. I can develop and update a portfolio showing my skills and accomplishments. *(K,R,S,P)*
10. I can develop and upgrade a resume for use with employers. *(K,R,S,P)*

Benchmark 2:
Utilize local resources to research career plans.
Learning Targets *(Type)*:
1. I can identify local resources to develop career plans. *(K)*
2. I can contact my school career counselor or teacher to pursue career pathways. *(S)*
3. I can experience presentations by representatives of post-secondary education career organizations and professionals in the field of welding.. *(K)*
4. I can explore and experience careers in welding through job-shadowing experiences. *(K,R)*
5. I can participation in local, state, and national completion.. *(K,S,R)*
6. I can be a part of and compete in the Skills USA Student Youth Organization. *(S)*

Benchmark 3:
Recognize the interrelationships of family, community, career, and leisure roles.
Learning Targets *(Type)*:
1. I can describe the importance of balance between family and community in regards to career and leisure activities. *(K)*
2. I can compare and contrast the needs of career and leisure activities and how they relate to and/or affect family and community. *(R)*

STANDARD 2: Students demonstrate an understanding and apply principles of Resource Management (i.e., financial, time, personal management).
Benchmark 1:
Prepare a budget and keep financial records.
Learning Targets (*Type*):
1. I can research and report cost of materials and time. *(R,S)*
2. I can document financial inputs and outputs. *(S)*
3. I can identify the necessity to maintain accurate financial records. *(K)*
4. I can stay within a fixed budget. *(S,P)*
5. I can prepare time or job cards, reports, or records. *(K,S)*

Benchmark 2:
Prioritize, allocate time, prepare and follow schedules to complete a project.
Learning Targets (*Type*):
1. I can estimate the required time to complete a project. *(R)*
2. I can prioritize resources, equipment and tasks. *(R)*
3. I can reflect upon completion. *(K)*

Benchmark 3:
Apply appropriate time to task.

Learning Targets (*Type*):
1. I can implement a time schedule for task completion. *(S)*
Benchmark 4:
Use physical resources wisely to accomplish a goal.
Learning Targets (*Type*):
1. I can identify the resources necessary to accomplish the task. *(K)*
2. I can maintain the tools of the trade. *(S)*
3. I can maximize the use of my resources. *(S)*

STANDARD 3: Students acquire and utilize personal and leadership skills to become successful, productive citizens.
Benchmark 1:
Demonstrate active leadership skills by participation in group activities and projects.
Learning Targets (*Type*):
1. I can investigate various leadership styles. *(R)*
2. I can apply leadership styles in group activities and projects. *(R)*
Benchmark 2:
Demonstrate positive personal and work ethics.
Learning Targets (*Type*):
1. I can arrive on time for class and work. *(S)*
2. I can develop personal and work related goals. *(K,P)*
3. I can describe ethical behavior in the workplace. *(K)*
Benchmark 3:
Demonstrate skills to be a productive citizen.
Learning Targets (*Type*):
1. I can develop professional relationships with community members. *(S)*
2. I can contribute to my community in a positive manner. *(S,P)*
3. I can demonstrate decision-making and problem-solving skills. *(S, K)*
4. I can follow verbal instructions to complete work assignments. *(S)*
5. I can follow written details to complete work assignments. *(S)*
Benchmark 4:
Apply self-esteem building practices.
Learning Targets (*Type*):
1. I can define and provide evidence of my strengths in my career interest areas. *(K,S)*
2. I can persevere through set backs and stay focused on my goals. *(S)*
Benchmark 5:
Demonstrate appreciation for diverse perspective needs and characteristics.
Learning Targets (*Type*):
1. I can develop a working relationship with diverse populations. *(K,S)*
2. I can demonstrate communication skills that contribute to positive relationships. *(S)*
3. I can work to understand diverse points of view. *(R)*
Benchmark 6:
Practice several methods of effective communication.
Learning Targets (*Type*):

1. I can demonstrate good listening skills. *(S)*
2. I can effectively communicate verbally through collaborative projects. *(S,P)*
3. I can develop quality written professional communications. *(P)*

STANDARD 4: Students acquire and demonstrate current technical skills leading to an occupation.
Benchmark 1:
Practice technical skills and procedures required for an occupation.
Learning Targets (*Type*):
1. I can perform basic math conversions. *(K,S)*
2. I can read and correctly use a tape measure, rule, and square. *(K,S)*
3. I can perform basic layout techniques. *(S)*
4. I can set up for shielded metal arc welding operations on plain carbon steel. *(K)*
5. I can start and restart an arc, crater, and backfill at the edge while running a bead on mild steel plate. *(K)*
6. I can build a pad on a mild steel plate in the flat position on plain carbon steel. *(S)*
7. I can weld to specifications a fillet weld in the flat position on plain carbon steel. *(S)*
8. I can weld to specifications a multi-pass fillet weld in the flat position on plain carbon steel. *(S)*
9. I can perform straight cutting operations on plain carbon steel. *(S)*
10. I can perform shape-cutting operations on plain carbon steel. *(S)*
11. I can perform bevel-cutting operations on plain carbon steel. *(S)*
12. I can set up for gas metal arc welding operations on plain carbon steel. *(K)*
13. I can operate gas metal arc welding equipment. *(K,S)*
14. I can use Short Circuit Transfer to make fillet welds in flat position on plain carbon steel. *(S)*
15. I can use Short Circuit Transfer to make groves welds, flat position, on plain carbon steel. *(S)*
16. I can use Spray Transfer to make fillet welds, flat position, on plain carbon steel. *(S)*
17. I can use Spray Transfer to make groove welds, flat position, on plain carbon steel. *(S)*
18. I can identify welding processes. *(K)*
Benchmark 2:
Practice safe and appropriate use of technology.
Learning Targets (*Type*):
1. I can complete a student safety pledge (Disclosure Statement). *(K)*
2. I can respond to first aid requirements. *(K)*
3. I can follow safe practices. *(K)*
4. I can perform housekeeping duties. *(K)*
5. I can successfully complete Safety Tests on equipment use. *(K)*
6. I can perform safety inspections of equipment and accessories. *(K)*
Benchmark 3:
Select the appropriate tools, equipment, and procedures for the task.
Learning Targets (*Type*):
1. I can operate manual oxyfuel gas cutting equipment. *(S)*
2. I can identify basic hand tools. *(K)*
3. I can identify basic power tools and equipment. *(K)*
Benchmark 4:
Manage and maintain technological tools and follow troubleshooting protocol.

Learning Targets (*Type*):
NOT ADDRESSED IN THIS COURSE.
Benchmark 5:
Apply technical information to a variety of sources.
Learning Targets (*Type*):
NOT ADDRESSED IN THIS COURSE.

STANDARD 5: Students know and demonstrate the requirements of the workplace through authentic application.
Benchmark 1:
Practice and demonstrate academic and technical skills to a workplace setting.
Learning Targets (*Type*):
1. I can practice, and demonstrate my technical workplace skills in my school lab. *(S)*
2. I can research, write and present on the technical content utilizing academic skills found in workplace settings. *(R,S,P)*
3. I can identify and apply the five "alphabet" lines in print reading. *(K,S)*
4. I can interpret tolerance dimensions in decimal, fractions, and degrees. *(R,S)*
5. I can identify and interpret basic welding symbols. *(K,S)*
6. I can draw welding symbols for given specifications. *(S)*
7. I can interpret a welding print and welding procedure specifications. *(R,S)*
Benchmark 2:
Apply the concepts of entrepreneurship.
Learning Targets (*Type*):
1. I can explain the concepts of entrepreneurship. *(K)*
2. I can demonstrate the concepts of entrepreneurship through a unique project. *(R,S)*
3. I can present my unique project to an authentic audience. *(S,P)*
Benchmark 3:
Identify possible outcomes and consequences of decisions.
Learning Targets (*Type*):
1. I can identify possible consequences of carelessness and horseplay. *(K)*
2. I can explain potential outcomes of not following directions, (i.e. safety, guidelines, rubrics). *(R)*
Benchmark 4:
Use acceptable industry standard equipment in a school setting.
Learning Targets (*Type*):
1. I can successfully use acceptable industry standard equipment to produce an authentic product within budget constraints. *(S,R,P)*