

Course Information

WELDING TECHNOLOGY II

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| Grade Level: | 10-11-12 |
| Prerequisite: | Successful completion of Welding I |
| Length: | 1 Semester |
| Period(s) Per Day: | 1 |
| Credit: | 2 |
| Credit Requirement Fulfilled: | Vocational/Elective |
| For Advisement: | For students with high interest in welding. |

Advanced skills in Oxyacetylene and Arc Welding with experience in the use of MIG and TIG welding and equipment maintenance are taught. Related information to hard facing and welding certification is integrated with the practical lab work. An introduction to welding fabrication is provided with the use of jigs and fixtures. **Projects will be at the student's expense. Welding helmet, safety glasses, welding goggles, gloves, coat, tape measure, and pliers are required.**

Course Objectives and Expectations

1. To explore basic and advanced skills associated with the Welding/Fabrication Industry.
2. To create a greater awareness to safety in our everyday routines.
3. To become aware of when to apply academic appropriate and technical skills in the Welding Industry.
4. To work productively in teams, and to use technology to enhance productivity
5. To utilize critical thinking to make sense of problems and persevere in solving them.

Student Objectives

After completing this course the student will be able to:

1. Identify tools and machines used in the welding industry'
2. List and perform core safety rules and procedures for self, PPE, shop, tools and machines efficiently,
3. Enhance skills in the areas of Oxyacetylene and Shielded Metal Arc Welding,
4. Identify the different metals used in fabrication by shape and composition,
5. Understand basic metallurgy an use it prevent errors in the welding process,
6. Become proficient in the understanding of weld symbols and blueprint/working drawing reading.
7. Develop a higher understanding and respect for safe working habits and clean up practices,
8. Select the appropriate welding materials to produce welds with the maximum strength and within proper parameters for that weld process.
9. Explore the various ways to treat different metals such as; Annealing, Tempering, and Sizing.

Quarter I/First 9 Weeks

Career and Education Exploration

MTCIS-Career and Learning Exploration
Personal Portfolio/Interest Surveys
Multiple Intelligences/Holland Personality Comparison

Technology

What is Technology?
How is Technology used in the Welding Industry?

Introduction to Safety

How is safety important in the Welding Industry?
What is Safety?
Types of Safety
Personal Protective Equipment (PPE)

Week 1, 2

Introduction to Welding

How is safety important in the Welding Industry?
What is Welding? /Types of Welding
Oxyacetylene
Principles of welding/Rose Project
Shielded Metal Arc Welding
Principles of welding/Metal Sculpture

Week 1, 2

Week 1, 2, 3, 4,

Week 3, 4, 5, 6

Introduction to Welding Blueprints/Weld Symbols

What are Welding Blueprints? /Types of Welding Blueprints
What are Weld Symbols? /Types of Weld Symbols

Week 1, 2, 3, 4

Introduction to Project Layout

Project Concept Ideas
Project Design
Project Bill of Materials/Cost Sheet
Personal Project

Week 3, 4, 5, 6

Quarter II/ First 9 Weeks

Individualized Project/Repairs

Time management Skills
Jigs and Fixtures

Week 9, 10, 11, 12

Introduction to Project Layout

Project Concept Ideas
Project Design/Project Bill of Materials/Cost Sheet
Personal Project

Week 12, 13, 14, 15, 16, 17

Introduction to Specialized Welding Processes

Gas Metal Arc Welding
Tungsten Metal Arc Welding
Aluminum Welding

Week 14, 15, 16, 17

Week 14, 15, 16, 17

Week 14, 15, 16, 17

Montana Content Standards/RST

The grades 6–12 literacy standards in history/social studies, science, and technical subjects are not meant to replace content standards in those areas but rather to supplement them. The Standards set requirements not only for English language arts (ELA) but also for literacy in History/social studies, science, and technical subjects.

RST 11.12 .3

RST 11.12 .9

MONTANA STANDARDS FOR CAREER AND VOCATIONAL TECHNICAL EDUCATION

Content Standards indicate what all students should know, understand and be able to do in a specific content area. Benchmarks define our expectations for students' knowledge, skills and abilities along a developmental continuum in each content area. That continuum is focused at three points—at the end of grade 8, the end of one high school course, and the completion of six units of vocational coursework.

CS1 BM 1 2 3

CS2 BM 2 34

CS3 BM 1 2 3

CS4 BM 1 2 345

CS5 BM 1 2 34

MONTANA STANDARDS FOR WORKPLACE COMPETENCIES

Content Standards indicate what all students should know, understand and be able to do in a specific content area. Benchmarks define our expectations for students' knowledge, skills and abilities along a developmental continuum in each content area. That continuum is focused at three points—at the end of grade 4, the end of grade 8, and grade 12.

CS1 BM 2 3

CS2 BM 12 345

CS3 BM 1 2 34

CS4 BM

CS5 BM 1 2 345

CS6 BM 1 2 346

Evaluation

Career and Vocational/Technical Education Performance Standards: A Profile of Four Levels

The Career and Vocational/Technical Education Performance Standards describe students' knowledge, skills, and abilities in the Career and Vocational/Technical content areas on a continuum from kindergarten through grade 12. These descriptions provide a picture or profile of student achievement at the four performance levels: advanced, proficient, nearing proficiency, and novice.

Advanced This level denotes superior performance.

Proficient This level denotes solid academic performance for each benchmark. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.

Nearing This level denotes that the student has partial mastery or prerequisite knowledge and **Proficiency** skills fundamental for proficient work at each benchmark.

Novice This level denotes that the student is beginning to attain the prerequisite knowledge and skills that are fundamental for work at each benchmark.

Upon Graduation Workplace Competencies

Advanced A graduating student at the advanced level in Workplace Competencies demonstrates superior performance. He/she: (a) independently identifies, organizes, plans and allocates workplace resources of time, money, human resources, material and facilities; (b) consistently practices workplace skills to identify, analyze, and evaluate procedures, policies, and individual team members' strengths; (c) competently communicates, interprets, and evaluates information; (d) independently evaluates and redesigns a variety of complex systems to improve system performance; (e) consistently selects, uses, and evaluates appropriate technologies and troubleshooting protocol in all learning situations; and (f) purposefully develops, evaluates and adjusts life and career plans and effectively demonstrates workplace readiness skills.

Proficient A graduating student at the proficient level in Workplace Competencies demonstrates solid academic performance. He/she: (a) identifies, organizes, plans and allocates workplace resources of time, money, human resources, material and facilities; (b) practices workplace skills to identify, analyze, and evaluate procedures, policies, and individual team members' strengths; (c) competently communicates, interprets, and evaluates information; (d) evaluates and redesigns a variety of complex systems to improve system performance; (e) selects, uses, and evaluates appropriate technologies and troubleshooting protocol in all learning situations; and (f) develops, evaluates and adjusts life and career plans and demonstrates workplace readiness skills.

Nearing Proficiency A graduating student at the nearing proficiency level in Workplace Competencies demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Workplace Competencies. He/she: (a) sometimes identifies, organizes and plans workplace resources of time, money, human resources, material and facilities, but has difficulty allocating these resources effectively; (b) sometimes practices workplace skills to identify and analyze procedures, policies, and individual team members' strengths; and, with assistance, evaluates the results; (c) communicates basic workplace information and, with assistance, interprets and evaluates basic workplace information; (d) sometimes evaluates and with assistance redesigns a system to improve system performance; (e) sometimes selects and uses appropriate technologies in learning situations and, with assistance, uses troubleshooting protocol; and (f) develops life and career plans and, with assistance, evaluates and makes adjustments; demonstrates workplace readiness skills.

Novice A graduating student at the novice level in Workplace Competencies is beginning to attain the prerequisite knowledge and skills that are fundamental in Workplace Competencies. He/she: (a) identifies, but has difficulty organizing, planning, or allocating workplace resources of time, money, human resources, material and facilities; (b) seldom practices workplace skills; (c) seldom communicates, interprets, or evaluates information; (d) seldom evaluates and has difficulty redesigning a basic system to improve system performance; (e) seldom selects or uses technologies or troubleshooting protocol in learning situations; and (f) rarely develops, evaluates, or adjusts life and career plans; but, with assistance, demonstrates workplace readiness skills.

Resources**Montana Content Standards/RST**

English Language Arts and Literacy in History/Social Studies, Science, and
Technical Subjects Grade-Level November 2011

Grades 11-12

Reading Standards for Literacy in Science and Technical Subjects

MONTANA STANDARDS FOR CAREER AND VOCATIONAL TECHNICAL EDUCATION

Career and Technical Education (CTE)

http://opi.mt.gov/Programs/CTAE/CTE.html#gpm1_13

MONTANA STANDARDS FOR WORKPLACE COMPETENCIES

Career and Technical Education (CTE)

<http://opi.mt.gov/pdf/Standards/ContStds-Workplace.pdf>