

METAL FABRICATION/DRAFTING



SYLLABUS

Silverton High School
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COURSE OBJECTIVES

The course will: emphasize how to safely use welding equipment, machines, and power tools through demonstration of welding processes and project fabrication. This course will also incorporate advanced engineering drafting skills.

The student will: learn and demonstrate advanced welding processes TIG, MIG, SMAW, GMAW along with developing difficult welding techniques and fabricating projects. Students will have an introduction to survey application, electrical, small engines, CAD, measurement (micrometers), CNC and metal machining processes throughout the course. In regards to safety, all students will be required to pass a written safety test on general shop safety and machinery. The student will also sign a safety contract which stresses the importance of proper conduct while in the metal shop.

Requirements:

All students must complete the following requirements before beginning to make a project:

1. Pass all safety tests.
2. Turn in a student safety contract.
3. Demonstrate machinery knowledge before beginning a project.
4. Wear safety glasses and observe all safety procedures while in the shop area.

Grades:

Grades will be earned with the following:

90%-100%=A; 80%-89%=B; 70%-79%=C; 60%-69%=D; < 59%=F

Points will be available in the following categories:

Academic (tests, projects, demonstrations)	75%
Personal Management (safety, clean-up, notebooks, record keeping)	25%

Course Guidelines:

- 1. Attend regularly and on time**
- 2. Respect the rights of others, don't be distracting**
- 3. If absent for any reason, the student is responsible for all make up work**
- 4. Bring writing utensils and paper**
- 5. Dress appropriately for shop work**
- 6. Prepare to purchase safety glasses and gloves**

FFA:

Every student in an agricultural sciences course is able to be an FFA member. FFA is an intracurricular part of agricultural education, and provides numerous opportunities for applying classroom learning in the real-world. Every year Silverton FFA members travel the state and even the nation participating in leadership development, competing with applied career skills, and getting the experience that will make them successful after high school. In addition, FFA members are eligible for literally millions of dollars yearly in scholarships, including several thousand dollars awarded by our local FFA Alumni. Participation in FFA activities is worth up to 10% of extra credit per semester.

Student Expectations:

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| Be Safe! | Be Ready to Learn! |
| Be Respectful! | Work Together! |
| Be Responsible! | Seek Excellence! |

Student Name: _____ **Course:** Metal Fabrication

Assignment 1: Student and Parent Signatures

I have read and understand the expectations and requirements for being part of this course and will follow them in order to successfully complete this class.

Student Signature

Parent Signature

Date

Communication:

Email makes it very easy to communicate between teachers and parents. If you have an email address please put it down below. This email will be shared with no other group or person and will only be used to provide information about upcoming activities or opportunities in the CTE program. If there is a need for more urgent contact you will be called.

Parent Email Address:

Weeks	Topics
<i>Weeks 1-2</i>	Safety <ul style="list-style-type: none"> • General shop • GMAW • SMAW • OAW • Equipment
Quiz over safety. Students must pass with 85% accuracy.	
<i>Weeks 3-4</i>	Review the SMAW, OAW, GMAW AND FCAW process/procedure <ul style="list-style-type: none"> • Machine set-up • Amperage information • Bead characteristics • Welding joints lap, tee and pipe joints with E6011/E7018 • Welding positions 3G/F and 4G/F • Welding troubleshooting porosity, arc blow, spatter, penetration
Quiz will be given at the end of week 5. Quiz will cover all processes in which students will demonstrate with welds using different welding joints and welding positions.	
<i>Weeks 5-6</i>	Bill of materials with drawing using CAD <ul style="list-style-type: none"> • Search for project • Draw project rough draft • Figure a bill of materials • Draw project CAD
Learning Activity Project (LAP) Student fabricates a project during class time using skills learned in previous courses	
<i>Week 7-12</i>	(LAP) <ul style="list-style-type: none"> • Metal ordering • Measurement, angles • Equipment use and setup • Machine setup and welding • Fabrication of project grinding, welding, drilling, machining • Finishing of project sanding, painting
(LAP) Project will be scored on weekly progress, finished project and skill level of project.	

Weeks 13-17	TIG, CAD drawing with welding symbols, brazing and record keeping <ul style="list-style-type: none"> • TIG process with 2F welds • CAD drawing sprocket and welding project • Brazing process with 2F welds • Record keeping using The AET program • Welding joints butt and lap • Welding positions 1G/F and 2G/F Welding troubleshooting and symbols
Quiz will be given at the end of 18 weeks. Quiz will cover TIG, brazing processes in which students will demonstrate with welding joints.	
Week 1-5	Fabricate a shovel project <ul style="list-style-type: none"> • Read a set of blue prints • Create a bill of materials/plan for project • Measurements • Equipment used will be band saw, drill press, chop saw, lathe and bender • Weld project together using E7018 and GMAW .045 wire • Prepare finished project
Week 6-7	Certification process <ul style="list-style-type: none"> • Cut out materials • Weld pieces together • Weld template using E7018 • Grind and prepare for bend test
Week 8-10	Small engine unit <ul style="list-style-type: none"> • Engine and tool part ID • Troubleshoot • Small motors maintenance
Test will be given at the end of week unit. Test will cover small engine ID and troubleshooting information.	
Week 11-12	Electrical unit <ul style="list-style-type: none"> • Terms • Single pole switches • Three-way switches • OHM's meter reading • Electrical motor parts
Week 13-15	Surveying, drill bit sharpening and tractor/implement ID <ul style="list-style-type: none"> • How to read and calculate survey problems • Steps used for sharpening drill bits

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|--|---|
| | <ul style="list-style-type: none">• Tractor parts ID• Implement ID plow, baler, planter etc. |
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<p>Students will be tested over a chapter or state contest covering the following skills: Welding SMAW process, electrical switches, small electrical motors, surveying, tool sharpening tractor and implement ID.</p>	
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<i>Week 16-18</i>	Learning Activity Projects (LAP) students working on fabrication of projects during and outside of class time.
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