

# Course Title: Metals 1

Department: Manufacturing and Engineering

Grades: 10-12 Credits: .5

## Course Overview/Description

Metals 1 will provide students experience in welding, cutting, and fabrication processes. Students will focus their time in this course on welding techniques and basic welding joints using both GMAW(Wire-feed) and SMAW(Stick) processes. Students will also learn to use PlasmaCAM to cut parts using the computer. Students will apply the skills they learn in their term projects.

## Scope and Sequence

Timeframe	Unit	Instructional Topics
1 Week	Safety	<ul style="list-style-type: none"><li>● PPE</li><li>● Fumes and Particulates</li><li>● Compressed Gas Cylinder</li><li>● Fire and Explosion</li><li>● Electrical Safety</li></ul>
4 Weeks	GMAW	<ul style="list-style-type: none"><li>● GMAW Welding Arc / Modes of Transfer</li><li>● GMAW Welding Consumables</li><li>● GMAW Welding Equipment</li><li>● GMAW Welding - Horizontal/Vertical - Lap/Tee/Butt</li></ul>
4 Weeks	SMAW	<ul style="list-style-type: none"><li>● SMAW Welding Arc</li><li>● SMAW Process Variables</li><li>● SMAW Consumables</li><li>● SMAW Welding - Horizontal/Vertical - Lap/Tee/</li></ul>
2 Weeks	Cutting	<ul style="list-style-type: none"><li>● Oxy - Fuel Cutting</li><li>● Safety / Set-Up</li><li>●</li><li>● Plasma Arc Cutting</li><li>● Plasma Machines</li></ul>
7 Weeks	Fabrication	<ul style="list-style-type: none"><li>● Tools<ul style="list-style-type: none"><li>○ Square</li><li>○ Jig Carts</li><li>○ Clamps</li><li>○ Tubing Notcher</li></ul></li><li>● Equipment<ul style="list-style-type: none"><li>○ Abrasive Chop Saw</li><li>○ Band Saw</li></ul></li></ul>

		<ul style="list-style-type: none"> <li>○ Cold Cut Saw</li> <li>○ Shears</li> <li>● Projects <ul style="list-style-type: none"> <li>○ Plans</li> <li>○ Costs</li> <li>○ Analysis</li> </ul> </li> </ul>
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**Essential Standards:**

I can identify, select and safely use tools, machines, products and systems for specific tasks	MNF1.a
I can demonstrate the ability to choose proper welding supplies given the process	MNF1.g.8.h
I can Identify different types of welding machines	MFN1.g.9.h
I can demonstrate safety and choose the proper safety equipment(ie, oxy-acetylene, GMAW, SMAW, GTAW, Ect)	MNF1.g.11.h
I can identify different types of welding joints and be able to perform the welds (ie, flat, horizontal)	MNF1.g.12.h
I can demonstrate the proper safety and use plasma cutting equipment	MNF1.h.7.h
I can demonstrate the use of Standard Measuring System to 1/16"	AC1.b.9.m