



WLD - 112, Basic Welding Processes

DOL DISCLAIMER:

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Orientation and Introduction

Introduction

Concept Content:

In this section you will give an introduction of yourself to your class. This is an opportunity to state your relevant experiences and credentials to teach this subject along with your personal background. This can help connecting with students. You can make a video introduction and upload it to this page as well.

Also, this is where you will give a brief overview of the course and what it's contents will be. There is a section later on in this module where you will give more detail about the course.

Course Syllabus

Concept Goals:

Insert the student learning outcomes for the course here.

Concept Content:

This is where you will upload the syllabus. You can do this either by uploading the syllabus text here or you can upload a copy of the syllabus under the resources tab for this section. If you do upload it to the resources, please be sure to give instructions to your students to look for the syllabus there.

Course Resources

Concept Goals:

You can leave this section blank provided you uploaded the student learning outcomes to the

previous section.

Concept Content:

This is where you would outline student support resources such as tutoring services, listing your office ours, contact info for support for your college's learning management system, etc. If there are documents you wish to upload, be sure to upload them to the resources tab and give instructions for the students to find the documents there.



Course Overview

Concept Goals:

Student Learning Outcomes:

1. Demonstrate proper safety practices and procedures for welding, including personal protective equipment, fire prevention, and hazard identification and mitigation according to industry standards (OSHA).
2. Set up and operate SMAW, GMAW, FCAW, and GTAW welding equipment according to manufacturer guidelines and AWS standards.
3. Demonstrate an understanding of the basic principles of metallurgy and how different metals react to different welding techniques, including weld puddle dynamics.
4. Identify weld discontinuities and defects, including lack of penetration, lack of fusion, porosity, and cracking, and ways to prevent and repair.
5. Perform metal fabrication techniques, including cutting, shaping, bending, and joining metal.

Concept Content:

This course introduces basic welding and cutting. Emphasis is placed on beads applied with gases, mild steel fillers, and electrodes and the capillary action of solder. Upon completion, students should be able to set up welding and oxy-fuel equipment and perform welding, brazing, and soldering processes.

Module	Module Learning Objectives
Module 1: Safety	<ul style="list-style-type: none">• Learn the typical functions and usage of personal protective equipment in the welding shop (SLO 1)• Understand the dangers of metal fume fever (SLO 1)• Identify shop safety violations (SLO 1)• Understand basic safety practices such as fire prevention (SLO 1)

Module 2: Measuring Tools	<ul style="list-style-type: none"> • Understand the differences between plumb bobs, levels, and squares. (SLO 5) • Understand how to use precision measuring tools such as calipers. (SLO 5)
Module 3: Intro to Metallurgy	<ul style="list-style-type: none"> • Understand the ferrous metals are (SLO 3) • Know the basic structure of metals (SLO 3) • Understand the negative effects exposure to air can have on weld metal (SLO 3) • Understand the basics of heat treatment (SLO 3)
Module 4: Soldering and Brazing	<ul style="list-style-type: none"> • Know the differences between brazing, soldering, and welding (SLO 5) • Understand what situations to use brazing, soldering, and welding (SLO 5) • Be able to perform basic soldering and brazing (SLO 5)
Module 5: Oxy-Fuel Equipment Set Up	<ul style="list-style-type: none"> • Understand safety practices concerning welding gas cylinders (SLO 2) • Be able to set up and shut down oxyfuel cutting equipment (SLO 2)
Module 6: Identifying Weld Discontinuities	<ul style="list-style-type: none"> • Be able to identify a good weld bead (SLO 4) • Understand some of the basic welding flaws and discontinuities (SLO 4) • Understand what causes common welding defects (SLO 4) • Describe the four types of porosity in detail (SLO 4)
Module 7: Mid-Term Exam	<ul style="list-style-type: none"> • Demonstrate understanding of the first six week's material.
Module 8: Fixing Weld Discontinuities	<ul style="list-style-type: none"> • Understand how to fix common welding defects (SLO 4)
Module 9: Basics of Blueprint Reading & Welding Symbols	<ul style="list-style-type: none"> • Define arrow side and other side on a welding symbol (SLO 2) • Identify basic blueprint lines (SLO 2)
Module 10: Intro to GMAW Welding	<ul style="list-style-type: none"> • Properly set up GMAW Equipment (SLO 2) • Understand how to troubleshoot common GMAW issues (SLO 2) • Understand proper GMA welding technique (SLO 2)
Module 11: Intro to FCAW Welding	<ul style="list-style-type: none"> • Understand safety practices regarding FCA welding (SLO 1) • Know how to set up and operate FCAW equipment (SLO 2) • Describe the FCAW process (SLO 3)
Module 12: Intro to SMAW Welding	<ul style="list-style-type: none"> • Describe the SMAW process (SLO 3) • Understand and demonstrate how to set up SMAW equipment (SLO 2)
Module 13: Intro to GTAW Welding	<ul style="list-style-type: none"> • Properly set up GTAW Equipment (SLO 2) • Understand proper GTA welding technique (SLO 2)
Module 14: Cutting and Shaping Metal	<ul style="list-style-type: none"> • Describe the differences between Plasma Arc, Carbon Arc, and Oxyfuel Cutting (SLO 5) • Demonstrate knowledge of cutting and shaping techniques (SLO 5)

Module 15: Final Exam

- Demonstrate an understanding of the course material.

Instructor Note: This is a 15 week course. If you need a 16th week due to your semesters being 16 weeks, you may have to create a 16th week.

Notes/Helpful Tips

Next Steps...

Your Census assignments are REQUIRED in order to remain in the class and they MUST be completed prior to the Census Date [insert census date here]. **If you do not have a census date requirement, you can delete this section.**

Effective note taking is also important for not only this course, but for your career as well. Note taking is a great way to retain information. The process of taking notes can keep you alert and focused on the information being presented. It also keeps your mind engaged with what you are hearing, increasing the likelihood you will retain that information. Note taking can also allow you to better organize your thoughts on the information being discussed.

Here is a [video](#) that provides some tips for effective note taking.

Module 1 - Safety

1.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Learn the typical functions and usage of personal protective equipment in the welding shop (SLO 1)
- Understand the dangers of metal fume fever (SLO 1)
- Identify shop safety violations (SLO 1)
- Understand basic safety practices such as fire prevention (SLO 1)

Concept Content:

This week, we will cover safety practices in welding. Our material this week will go over personal

protective equipment (ppe) regarding what pieces you will need in the welding shop, and how to use it properly. We will also discuss the hazards of fumes and gasses. We will also cover fire and electrical safety. Due to the potential hazards of the welding shop, it is important for us to make sure you are aware of those dangers before going forward. This knowledge will help prepare you to handle them successfully and keep yourself and others safe.

This week at a glance:

Lecture:

[Welding Safety Lecture](#) - 90 Slides

Reading:

[Safety Practices in Welding](#) - 14 Pages (Instructor Note: This material can only be used if your school uses Lincoln Electric equipment).

[Fumes and Gasses Fact Sheet](#) - 3 Pages

[Metal Fume Fever Fact Sheet](#) - 3 Pages

Videos:

[What you need to know about welding safety and PPE](#) - 15 Minutes

Assignment:

Welding Violations Example Assignment



1.2 Module Content Resources

Concept Content:

This week's material.

Lecture:

[Welding Safety Lecture](#) - 90 Slides

Reading:

[Safety Practices in Welding](#) - 14 Pages (Instructor Note: This material can only be used if your school uses Lincoln Electric equipment).

[Fumes and Gasses Fact Sheet](#) - 3 Pages

[Metal Fume Fever Fact Sheet](#) - 3 Pages

Videos:

[What you need to know about welding safety and PPE](#) - 15 Minutes

1.3 Module Assessment/Assignment

Concept Content:

This week's assignment:

[Welding Violations Example](#): Download the violations poster and try to identify violations 1-10 and 40-50. Upload your answer sheet to the assignments tab under quiz.

Instructor Note: The answer key for this assignment is located in the faculty resources module.

1.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

1.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



1.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- **Learn the typical functions and usage of personal protective equipment in the welding shop (SLO 1)**
- **Understand the dangers of metal fume fever (SLO 1)**
- **Identify shop safety violations (SLO 1)**
- **Understand basic safety practices such as fire prevention (SLO 1)**

Concept Content:

This week, we covered welding safety practices. You should now have more understanding of potential hazards as well as how to mitigate them. Next week we will start our module on measuring tools.

This week in review:

Lecture:

[Welding Safety Lecture](#) - 90 Slides

Reading:

[Safety Practices in Welding](#) - 14 Pages (Instructor Note: This material can only be used if your school uses Lincoln Electric equipment).

[Fumes and Gasses Fact Sheet](#) - 3 Pages

[Metal Fume Fever Fact Sheet](#) - 3 Pages

Videos:

[What you need to know about welding safety and PPE](#) - 15 Minutes

Assignment:

Welding Violations Example Assignment - **Due by [insert due date here]**



Module 2 - Measuring Tools



2.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Understand the differences between plumb bobs, levels, and squares. (SLO 5)
- Understand how to use precision measuring tools such as calipers. (SLO 5)

Concept Content:

This week we will go over semi-precision and precision measurement. We will cover tools such as calipers, plumb bobs, squares, etc. To successfully carry out welding tasks, you need to know how to properly take measurements. This includes knowing how to use measuring tools. These are foundational skills you will need to be successful in welding.

This week at a glance:

Lectures:

[Basics of Semi Precision Measurement](#) - 16 Slides

[Semi Precision and Precision Presentation](#) - 24 Slides

[Calipers](#) - 41 Slides

Videos:

[How to Use a Plumb Bob](#) - 4 Minutes

[Plumb vs Level vs Square...What's the Difference](#) - 6 Minutes

Assignment:

Caliper Lab - To be completed in class

Module 2 Quiz - 5 Questions



2.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Content:

Lectures:

[Basics of Semi Precision Measurement](#) - 16 Slides

[Semi Precision and Precision Presentation](#) - 24 Slides

[Calipers](#) - 41 Slides

Videos:

[How to Use a Plumb Bob](#) - 4 Minutes

[Plumb vs Level vs Square...What's the Difference](#) - 6 Minutes



2.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignments

[Caliper Lab](#) - To be completed in class. Download and print out the worksheet and measure the image as directed.

Module 2 Quiz - 5 Questions - Located under the assignments tab.



2.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on

the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

2.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.

2.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should:

- **Understand the differences between plumb bobs, levels, and squares. (SLO 5)**
- **Understand how to use precision measuring tools such as calipers. (SLO 5)**

Concept Content:

This week we discussed semi-precision and precision measurement and the tools welders use to do those measurements. Next week, we will have an introduction to metallurgy.

This week in review:

Lectures:

[Basics of Semi Precision Measurement](#) - 16 Slides

[Semi Precision and Precision Presentation](#) - 24 Slides

[Calipers](#) - 41 Slides

Videos:

[How to Use a Plumb Bob](#) - 4 Minutes

[Plumb vs Level vs Square...What's the Difference](#) - 6 Minutes

Assignment:

Caliper Lab - To be completed in class

Module 2 Quiz - 5 Questions - Due by **[insert due date here]**

Module 3 - Intro to Metallurgy

3.1 Module Overview

Concept Goals:

By the end of this module, you should:

- **Understand the ferrous metals are (SLO 3)**
- **Know the basic structure of metals (SLO 3)**
- **Understand the negative effects exposure to air can have on weld metal (SLO 3)**
- **Understand the basics of heat treatment (SLO 3)**

Concept Content:

This week we will begin our instruction on metallurgy. This module is an introduction to the topic. We will cover some of the fundamentals and basics of metallurgy and how it relates to welding. Per the Oxford dictionary metallurgy is "the branch of science and technology concerned with the properties of metals and their production and purification." Basic knowledge of metallurgy can help make welding easier to do and easier to understand.

Readings:

[Fundamentals of Metallurgy](#) - 10 Pages

[Metallurgy and Welding](#) - 6 Pages

[Metallurgy and Heat Treating](#) - 11 Pages

Videos:

[Basics of Metallurgy](#) - 19 Minutes

Assignments:

Module 3 Quiz - 8 Questions



3.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Content:

Readings:

[Fundamentals of Metallurgy](#) - 10 Pages

[Metallurgy and Welding](#) - 6 Pages

[Metallurgy and Heat Treating](#) - 11 Pages



Videos:

[Basics of Metallurgy](#) - 19 Minutes

Optional: [Metallurgy Video](#) - How It Works - 58 Minutes. (Instructor note: given the length of the video, it might be best to leave this as optional. Or, view the video and direct students to watch parts that complement the content discussed in the previous video. This video is very comprehensive and might be good to utilize during classroom hours.)



3.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 3 Quiz - 8 Questions



3.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



3.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



3.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- **Understand the ferrous metals are (SLO 3)**
- **Know the basic structure of metals (SLO 3)**
- **Understand the negative effects exposure to air can have on weld metal (SLO 3)**
- **Understand the basics of heat treatment (SLO 3)**

Concept Content:

This week we went over some of the basics of metallurgy. As you can see, it is important to understand how metals will react in order to properly weld them. Next week we will cover soldering and brazing.

Readings:

[Fundamentals of Metallurgy](#) - 10 Pages

[Metalurgy and Welding](#) - 6 Pages

[Metalurgy and Heat Treating](#) - 11 Pages

Videos:

[Basics of Metallurgy](#) - 19 Minutes

Assignment:

Module 3 Quiz - 8 Questions

Module 4 - Soldering and Brazing

4.1 Moudle Overview

Concept Goals:

By the end of this module, you should:

- **Know the differences between brazing, soldering, and welding (SLO 5)**
- **Understand what situations to use brazing, soldering, and welding (SLO 5)**
- **Be able to perform basic soldering and brazing (SLO 5)**

Concept Content:

This week we will cover soldering and brazing. Welding is not the only way to fuse metals together. Soldering and brazing are also methods used to join metals together. These two methods work differently for welding and can be handier than welding depending on the situation. This week, we will cover how they are different from welding, what situations you would want to use them in as opposed to welding, and the basics of how to do soldering and brazing.

This week at a glance:

Reading:

[Soldering vs Welding: What Are the Differences?](#)

[Brazing Explained - Definition, Process, Types](#)

Videos:

[Soldering Safety](#) - 3 Minutes

[Soldering Animation](#) - 1.5 Minutes

[Welding vs Soldering vs Brazing](#) - 9 Minutes

[What is Brazing](#) - 4 Minutes

Assignments:

Module 4 Quiz - 8

4.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's content:

Reading:

[Soldering vs Welding: What Are the Differences?](#)

(2022, April 26). *Soldering vs. welding: What are the differences?*. All Metals Fabricating.

<https://www.ametals.com/post/soldering-vs-welding-what-are-the-differences>

(note to students: there is a sentence in there that states "The temperature required to melt metal is around 6,500 °F." This is just a general statement as all metals have different melting temperatures. If you need to know what temperature a certain metal melts, be sure to research that).

[Brazing Explained - Definition, Process, Types](#)

Sild, S. (2022, September 13). *Brazing explained - definition, process, types*. Fractory.

<https://fractory.com/brazing-explained/>

Videos:

[Soldering Safety](#) - 3 Minutes

[Soldering Animation](#) - 1.5 Minutes

[Welding vs Soldering vs Brazing](#) - 9 Minutes

[What is Brazing](#) - 4 Minutes



4.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 4 Quiz - 8 Questions



4.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



4.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



4.6 Module Wrap-Up

Concept Goals:

Module Learning Outcomes

- **Know the differences between brazing, soldering, and welding (SLO 5)**
- **Understand what situations to use brazing, soldering, and welding (SLO 5)**
- **Be able to perform basic soldering and brazing (SLO 5)**

Concept Content:

This week we covered soldering and brazing. Throughout this module, we covered the basics of both processes and how they are different from welding. Next week, we will cover how to properly set up oxy-fuel equipment along with other pieces of welding equipment.

This week in review:

Reading:

[Soldering vs Welding: What Are the Differences?](#)

[Brazing Explained - Definition, Process, Types](#)

Videos:

[Soldering Safety](#) - 3 Minutes

[Soldering Animation](#) - 1.5 Minutes

[Welding vs Soldering vs Brazing](#) - 9 Minutes

[What is Brazing](#) - 4 Minutes

Assignments:

Module 4 Quiz - 8



Module 5 - Oxy-Fuel Equipment Set Up



5.1 Module Overview

Concept Goals:

By the end of the module, you should:

- **Understand safety practices concerning welding gas cylinders (SLO 2)**
- **Be able to set up and shut down oxyfuel cutting equipment (SLO 2)**

Concept Content:

This week we will go over oxyfuel equipment set up as well as go into a overview of handling gas cylinders. Due to the explosive nature of the gasses inside the cylinders and oxyfuel equipment, it is important to know how to safely set up and shut down oxyfuel equipment.

This week at a glance:

Lectures:

[Oxyfuel Presentation](#) - 23 Slides

Videos:

[Safe Oxyfuel Setup and Operation](#) - 20 Minutes

[Setting up an Oxyfuel Cutting Torch System](#) - 7.5 Minutes

[Basics of Cylinder handling](#) - 5 Minutes

Handouts:

[Oxyfuel Cutting Setup and Shutdown Procedure](#) - 7 Pages

Assignment:

Walkthrough the setup and shutdown procedures in class



5.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Content:

Lectures:

[Oxyfuel Presentation](#) - 23 Slides

Videos:

[Safe Oxyfuel Setup and Operation](#) - 20 Minutes

[Setting up an Oxyfuel Cutting Torch System](#) - 7.5 Minutes

[Basics of Cylinder handling](#) - 5 Minutes

Handouts:

[Oxyfuel Cutting Setup and Shutdown Procedure](#) - 7 Pages



5.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Go over the set up and shutdown procedures for oxyfuel equipment in class. Module 5.2 has the handout to serve as a guide.



5.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



5.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



5.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- **Understand safety practices concerning welding gas cylinders (SLO 2)**
- **Be able to set up and shut down oxyfuel cutting equipment (SLO 2)**

Concept Content:

This week we went over oxyfuel equipment set up and handling gas cylinders. Next week we will have an introduction to GMAW welding.

This week at a glance:

Lectures:

[Oxyfuel Presentation](#) - 23 Slides

Videos:

[Safe Oxyfuel Setup and Operation](#) - 20 Minutes

[Setting up an Oxyfuel Cutting Torch System](#) - 7.5 Minutes

[Basics of Cylinder handling](#) - 5 Minutes

Handouts:

[Oxyfuel Cutting Setup and Shutdown Proceture](#) - 7 Pages

Assignment:

Walkthrough the setup and shutdown procedures in class

Module 6 - Identifying Weld Discontinuities

6.1 Module Overview

Concept Goals:

By the end of this week you should:

- Be able to identify a good weld bead (SLO 4)
- Understand some of the basic welding flaws and discontinuities (SLO 4)
- Understand what causes common welding defects (SLO 4)
- Describe the four types of porosity in detail (SLO 4)

Concept Content:

This week we will begin our three week section regarding welding discontinuities. This week we will mainly focus on identifying that is a good weld. In order to identify welding flaws, you have to know what is considered good welding first. We will look into various examples of good welding beads and discuss how to make them. We will have one lecture regarding welding defects but we will go into more detail regarding them next week.

This week at a glance:

Reading:

[Good Welds and How to Make Them](#) - 8 Pages

[Welding Issues](#) - 12 Pages

[Weldment Distortion](#) - 19 Pages

[Weld Quality](#) - 8 Pages

Porosity - embedded in module 6.2

Lectures:

[Welding Defects](#) - 14 Slides

Handouts:

[Fillet weld profiles](#) - 2 pages

Videos:

[Is My Weld Good? \(5 Ways to Check Your Weld\)](#) - 4 Minutes

[WELDING DEFECTS- Porosity, cracks, undercut, lack of fusion, arc strike, underfill, LOF](#) - 8 Minutes

Assignment:

Module 6 Quiz - 13 Questions

✓ **6.2 Module Content Resources**

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's content:

Textbook:

[Good Welds and How to Make Them](#) - 8 Pages **(Instructor Note: Your school can use this textbook provided you also use Lincoln Electric equipment)**

Lincoln Electric (1990) *New Lessons in ARC Welding* 4th Edition 16th Printing.



Lectures:

[Welding Defects](#) - 14 Slides

Handouts:

[Fillet weld profiles](#) - 2 pages

Reading:

[Welding Issues](#) - 12 Pages

[Weldment Distortion](#) - 19 Pages

[Weld Quality](#) - 8 Pages

Chapters from:

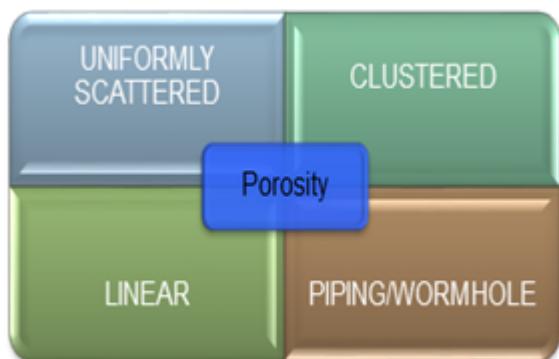
James F. Lincoln Arc Welding Foundation (2000) *The Procedure Handbook of Arc Welding*. 14th Edition



(Instructor Note: You can use the textbook provided your school uses Lincoln Electric products to teach)

Types of Porosity:

There are **four types** of porosity (see Figure 2) that need to be discussed.



Uniformly Scattered Porosity is most commonly a system failure and it will occur for the duration of the weld. Most times, this is not a technique issue but failure of some part of the system such as a lack of shielding at the weld. To correct this, we must track down the reason for that lack of

shielding, whether it is replacing the gas or replacing the electrode with one in better condition. We must ensure shielding is provided at the molten weld puddle to protect it from the atmospheric gases.

Clustered Porosity is normally a matter of bad technique at the beginning of a weld. It is caused by long arcing as the arc is initiated. Continuous practice and mastering techniques in welding will correct clustered porosity.

Linear Porosity will be found in line with the joint that is being welded and is normally just bad work practices and not properly cleaning the base metal where the weld will take place. It can also be a matter of bad fit-up allowing atmosphere to reach the weld from the opposite side of the weld joint. Corrective action is to properly clean and fit-up all parts using proper work practices in preparation for the actual weld.

Piping or Wormhole Porosity is caused by gas that is trying to escape through the weld. This will create a hole within the weld. Piping/Wormhole porosity error looks like a hole made by a worm eating its way through an apple. The corrective action for this is to keep the molten puddle in the liquid state for a longer period of time. This allows for all gas, created from the welding process, to fully escape out of the weld into the slag. We can keep the molten weld puddle in the liquid state longer by increasing the heat input through turning up the voltage or amperage depending on the process, slowing our travel speed, decreasing wire speed so less energy is consumed in melting of the core wire, or shortening of the arc length thus generating more heat at the weld puddle allowing the gases to escape. See Figure 3 for actual examples.

Videos:

[Is My Weld Good? \(5 Ways to Check Your Weld\)](#) - 4 Minutes

[WELDING DEFECTS- Porosity, cracks, undercut, lack of fusion, arc strike, underfill, LOF](#) - 8 Minutes



6.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 6 Quiz - 13 Questions



6.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted

to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class. This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

6.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.

6.6 Module Wrap-Up

Concept Goals:

Module Learning Outcomes:

- **Be able to identify a good weld bead (SLO 4)**
- **Understand some of the basic welding flaws and discontinuities (SLO 4)**
- **Understand what causes common welding defects (SLO 4)**
- **Describe the four types of porosity in detail (SLO 4)**

Concept Content:

This week we began our three-week section regarding welding discontinuities. This week's main focus was on identifying a good weld. Next week, we will elaborate more on welding discontinuities and flaws.

This week in review:

Reading:

[Good Welds and How to Make Them](#) - 8 Pages

[Welding Issues](#) - 12 Pages

[Weldment Distortion](#) - 19 Pages

[Weld Quality](#) - 8 Pages

Porosity - embedded in module 6.2

Lectures:

[Welding Defects](#) - 14 Slides

Handouts:

[Fillet weld profiles](#) - 2 pages

Videos:

[Is My Weld Good? \(5 Ways to Check Your Weld\)](#) - 4 Minutes

[WELDING DEFECTS- Porosity, cracks, undercut, lack of fusion, arc strike, underfill, LOF](#) - 8 Minutes

Assignment:

Module 6 Quiz - 13 Questions - due by **(insert due date here)**

Module 7 - Mid-Term Exam

7.1 Module Overview

Concept Goals:

Demonstrate understanding of the first six week's material.

Concept Content:

This week will be our mid-term exam. It will encompass the first six modules, safety through GTAW welding. The exam is located under the assignments tab. Click on test to open the exam.

Mid-Term Exam: 36 Questions **(instructor note: you can adjust this by picking and choosing which questions to use or you can add your own)**



7.2 Module Wrap-Up

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we had our mid-term exam. The course is halfway through! Next week, we will start the back half of the semester.



Module 8 - Fixing Weld Discontinuities



8.1 Module Overview

Concept Goals:

By the end of this module, you should:

- **Understand how to fix common welding defects (SLO 4)**

Concept Content:

This week we will finish our section on weld discontinuities. This week we will focus on fixing weld defects and discontinuities.

This week at a glance:

Reading:

[Troubleshooting 12 Common Welding Issues](#)

Videos:

[Fixing Bad Welds](#) - 14.5 Minutes

[How to Repair Common Defects with the Proper Tool](#) - 15 Minutes

Assignment:

8.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's content:

Reading:

[Troubleshooting 12 Common Welding Issues](#)

N/A, U. (2021, May 6). *Troubleshooting your weld - the 12 most common problems & how to fix them: Unimig welding guides & tutorials*. UNIMIG.

<https://unimig.com.au/troubleshooting-your-weld-the-12-most-common-problems-how-to-fix-them/>

Videos:

[Fixing Bad Welds](#) - 14.5 Minutes

[How to Repair Common Defects with the Proper Tool](#) - 15 Minutes

8.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 9 Quiz - 10 Questions



8.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



8.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



8.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should:

- **Understand how to fix common welding defects (SLO 4)**

Concept Content:

This week we finished our section on weld discontinuities. Next week we will have an introduction to cutting and shaping metal.

This week in review:

Reading:

[Troubleshooting 12 Common Welding Issues](#)

Videos:

[Fixing Bad Welds](#) - 14.5 Minutes

[How to Repair Common Defects with the Proper Tool](#) - 15 Minutes

Assignment:

Module 9 Quiz - 10 Questions - due by **[insert due date here]**

Module 9 - Basics of Blueprint Reading and Welding Symbols

9.1 Module Overview

Concept Goals:

By the end of this module, you should be able to:

- Define arrow side and other side on a welding symbol (SLO 2)
- Identify basic blueprint lines (SLO 2)

Concept Content:

This week we continue our section on weld defects and discontinuities. We will look more in-depth about the different kinds of welding defects.

This week at a glance:

Reading:

[Basics of Blueprint Reading](#) - 12 Pages

[Basics of Welding Symbols](#) - 4 Pages

[Fillet Welds](#) - 12 Pages

[Groove Welds](#) -16 Pages

Video:

[How to Read Blueprints and Shop Drawings with Weld Symbols](#) - 26.5 Minutes

Assignment:

Module 9 Quiz - 10 Questions

9.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will have a brief overview of reading blueprints and shop drawings. Throughout your career, you will need to know how to read and interpret shop prints so that you carry out welding processes correctly. We will discuss basic blueprint lines and what they mean, the basics of a welding symbol, and will discuss two basic types of joints.

This Week's Content:

Reading:

[Basics of Blueprint Reading](#) - 12 Pages

[Basics of Welding Symbols](#) - 4 Pages

[Fillet Welds](#) - 12 Pages

[Groove Welds](#) -16 Pages

Chapters from

Prosser, Mark. (2019). *How to Read Shop Drawings: With Special Reference to Arc Welding*, The James F. Lincoln Arc Welding Foundation. - **Can use as long as your institution uses Lincoln Electric products in your welding labs.**



Video:

[How to Read Blueprints and Shop Drawings with Weld Symbols](#) - 26.5 Minutes



9.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 9 Quiz - 10 Questions



9.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



9.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



9.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- Define arrow side and other side on a welding symbol (SLO 2)
- Identify basic blueprint lines (SLO 2)

Concept Content:

This week we continued our section on weld defects and discontinuities. Next week we will wrap up our welding discontinuity and defect module by looking over how to fix common welding mistakes.

This week in review:

Reading:

[Basics of Blueprint Reading](#) - 12 Pages

[Basics of Welding Symbols](#) - 4 Pages

[Fillet Welds](#) - 12 Pages

[Groove Welds](#) -16 Pages

Video:

[How to Read Blueprints and Shop Drawings with Weld Symbols](#) - 26.5 Minutes

Assignment:

Module 9 Quiz - 10 Questions

Module 10 - Intro to GMAW Welding

10.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Properly set up GMAW Equipment (SLO 2)
- Understand how to troubleshoot common GMAW issues (SLO 2)
- Understand proper GMA welding technique (SLO 2)

Concept Content:

This week we will go over the basics of GMA welding. We will have an overview of GMA welding, discuss safety with GMA welding, and have a brief overview of GMA welding techniques and troubleshooting.

This week at a glance:

Textbook:

[GMAW Welding Overview](#) - 12 Pages

Reading:

[What is GMAW & How Does it Work](#)

Videos:

[Mig Welding Overview Video](#) - 2 Minutes

[Mig Welding Safety and Technique](#) - 4 Minutes

[Mig Welding Technique](#) - 2.5 Minutes

[GMAW \(MIG\) Troubleshooting](#) - 15 Minutes

Assignment:

Module 10 Quiz - 10 Questions



10.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's content:

Textbook:

[GMAW Welding Overview](#) - 12 Pages **(Instructor Note: Your school can use this textbook provided you also use Lincoln Electric equipment)**

Lincoln Electric (1990) *New Lessons in ARC Welding* 4th Edition 16th Printing.



Reading:

[What is GMAW & How Does it Work](#)

Grill, J. (2024, January 22). *What is GMAW (Mig Welding) & How Does It Work?*. Weld Guru. <https://weldguru.com/mig-welding/>

Videos:

[Mig Welding Overview Video](#) - 2 Minutes

[Mig Welding Safety and Technique](#) - 4 Minutes

[Mig Welding Technique](#) - 2.5 Minutes

[GMAW \(MIG\) Troubleshooting](#) - 15 Minutes

10.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 10 Quiz -10 Questions

10.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



10.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



10.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should:

- **Properly set up GMAW Equipment (SLO 2)**
- **Understand how to troubleshoot common GMAW issues (SLO 2)**
- **Understand proper GMA welding technique (SLO 2)**

Concept Content:

This week we went over the basics of GMA welding. We will have an overview of GMA welding, discuss safety with GMA welding, and have a brief overview of GMA welding techniques and troubleshooting.

This week at a glance:

Textbook:

[GMAW Welding Overview](#) - 12 Pages

Reading:

[What is GMAW & How Does it Work](#)

Videos:

[Mig Welding Overview Video](#) - 2 Minutes

[Mig Welding Safety and Technique](#) - 4 Minutes

[Mig Welding Technique](#) - 2.5 Minutes

[GMAW \(MIG\) Troubleshooting](#) - 15 Minutes

Assignment:

Module 10 Quiz - 10 Questions

Module 11 - Intro to FCAW Welding

11.1 Module Overview

Concept Goals:

By the end of this module, you should:

- **Understand safety practices regarding FCA welding (SLO 1)**
- **Know how to set up and operate FCAW equipment (SLO 2)**
- **Describe the FCAW process (SLO 3)**

Concept Content:

This week we will have an overview of Flux Cord Arc Welding. This will include what Flux Cord Arc Welding is, the equipment that is used for it, basics on how to do FCA welding, and ways of troubleshooting common issues. This is just an introduction as other courses in the program will go more in depth about the process.

This week at a glance:

Lecture:

[FCAW Presentation - 17](#)

Reading:

[What is Flux Cord Arc Welding](#)

Stoltz, R. (2021, December 10). *A complete guide on Flux Cored Arc Welding (FCAW)*. NEIT. <https://www.neit.edu/blog/fcaw-welding>

Videos:

[What is a Flux Cord Arc Welding](#) - 5 Minutes
[Flux Core Welding: Basics You Need to Know](#) - 6.5 Minutes
[#1 Mistake Made When Flux Core Welding](#) - 12 Minutes
[FCAW-G vs FCAW-S Welding](#) - 7.5 Minutes

Assignment:

Module 11 Quiz - 8 Questions

11.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's content:

Lecture:

[FCAW Presentation - 17](#)

Reading:

[What is Flux Cored Arc Welding](#)

Stoltz, R. (2021, December 10). *A complete guide on Flux Cored Arc Welding (FCAW)*. NEIT. <https://www.neit.edu/blog/fcaw-welding>

Videos:

[What is a Flux Cored Arc Welding](#) - 5 Minutes
[Flux Core Welding: Basics You Need to Know](#) - 6.5 Minutes
[#1 Mistake Made When Flux Core Welding](#) - 12 Minutes
[FCAW-G vs FCAW-S Welding](#) - 7.5 Minutes

11.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 11 Quiz - 8 Questions - Located under the assignments tab.



11.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



11.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



11.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should:

- **Understand safety practices regarding FCA welding (SLO 1)**
- **Know how to set up and operate FCAW equipment (SLO 2)**
- **Describe the FCAW process (SLO 3)**

Concept Content:

This week we went into the basics of FCA welding. Next week, we will go into GTAW welding.

This week in review:

Lecture:

[FCAW Presentation - 17](#)

Reading:

[What is Flux Cord Arc Welding](#)

Stoltz, R. (2021, December 10). *A complete guide on Flux Cored Arc Welding (FCAW)*. NEIT. <https://www.neit.edu/blog/fcaw-welding>

Videos:

[What is a Flux Cord Arc Welding](#) - 5 Minutes

[Flux Core Welding: Basics You Need to Know](#) - 6.5 Minutes

[#1 Mistake Made When Flux Core Welding](#) - 12 Minutes

[FCAW-G vs FCAW-S Welding](#) - 7.5 Minutes

Assignment:

Module 11 Quiz - 8 Questions - This is due by **[insert due date here]**

Module 12 - Intro to SMAW Welding

12.1 Module Overview

Concept Goals:

By the end of this module, you should:

- **Describe the SMAW process (SLO 3)**
- **Understand and demonstrate how to set up SMAW equipment (SLO 2)**

Concept Content:

This week we will cover SMA welding. This process is commonly known as stick welding. It is another common welding method and one you will learn in more depth throughout the welding program. This module in the course is meant as an overview of stick welding.

Lecture:

[SMAW Lecture](#) - 34 Slides

Videos:

[SMAW Welding Basics](#) - 6 Minutes

[Stick Welding Part 2](#) - 4.5 Minutes

[Stick Welding Part 3](#) - 5.5 Minutes

[Stick Welding Part 4](#) - 3.5 Minutes

Assignments:

Module 12 Quiz - 5 Questions



12.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's content:

Lecture:

[SMAW Lecture](#) - 34 Slides

Videos:

[SMAW Welding Basics](#) - 6 Minutes

[Stick Welding Part 2](#) - 4.5 Minutes

[Stick Welding Part 3](#) - 5.5 Minutes

[Stick Welding Part 4](#) - 3.5 Minutes



12.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 12 Quiz - 5 Questions



12.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



12.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



12.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should:

- **Describe the SMAW process (SLO 3)**
- **Understand and demonstrate how to set up SMAW equipment (SLO 2)**

Concept Content:

This week we covered SMA welding. Next week we will look into FCAW welding.

Lecture:

[SMAW Lecture](#) - 34 Slides

Videos:

[SMAW Welding Basics](#) - 6 Minutes

[Stick Welding Part 2](#) - 4.5 Minutes

[Stick Welding Part 3](#) - 5.5 Minutes

[Stick Welding Part 4](#) - 3.5 Minutes

Assignments:

Module 12 Quiz - 5 Questions

Module 13 - Intro to GTAW Welding

13.1 Module Overview

Concept Goals:

By the end of this module, you should be able to:

- Properly set up GTAW Equipment (SLO 2)
- Understand proper GTA welding technique (SLO 2)

Concept Content:

This week we will cover Gas Tungsten Arc Welding (GTAW) also known as TIG welding. This is the last of the welding types we will cover in this class. We are just going to have an overview of GTAW. This will include what GTAW is, how it works, and how to set up the equipment for it.

Textbook:

[TIG Welding](#) - 14 Pages

Lincoln Electric (1990) *New Lessons in ARC Welding* 4th Edition 16th Printing.



Lectures:

[GTAW Welding Overview](#) - 16 Slides

[GTAW Lesson 2](#) - 21 Slides

Videos:

[TIG Welding \(Animation\)](#) - 2 Minutes

[How to Set Up TIG Welder](#) - 7 Minutes

[How to Assemble a TIG Torch](#) - 8 Minutes

Assignment:

Module 13 Quiz



13.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's content:

Textbook:

[TIG Welding](#) - 14 Pages

Lectures:

[GTAW Welding Overview](#) - 16 Slides

[GTAW Lesson 2](#) - 21 Slides

Videos:

[TIG Welding \(Animation\)](#) - 2 Minutes

[How to Set Up TIG Welder](#) - 7 Minutes

[How to Assemble a TIG Torch](#) - 8 Minutes

13.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 13 Quiz - 8 Questions

13.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

13.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.

13.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should be able to:

- **Properly set up GTAW Equipment (SLO 2)**
- **Understand proper GTA welding technique (SLO 2)**

Concept Content:

This week we covered Gas Tungsten Arc Welding (GTAW) also known as TIG welding. This was the last of the welding types this course would be touching on. Next week, we will begin our section on weld discontinuities.

Textbook:

[TIG Welding](#) - 14 Pages

Lectures:

[GTAW Welding Overview](#) - 16 Slides

[GTAW Lesson 2](#) - 21 Slides

Videos:

[TIG Welding \(Animation\)](#) - 2 Minutes

[How to Set Up TIG Welder](#) - 7 Minutes

[How to Assemble a TIG Torch](#) - 8 Minutes

Assignment:

Module 13 Quiz - 8 Questions - **Due by [insert due date here]**

Module 14 - Cutting and Shaping Metal

14.1 Module Overview

Concept Goals:

By the end of this week, you should be able to:

- **Describe the differences between Plasma Arc, Carbon Arc, and Oxyfuel Cutting (SLO 5)**
- **Demonstrate knowledge of cutting and shaping techniques (SLO 5)**

Concept Content:

This week we will have a brief overview of cutting and shaping. We will discuss three types of

cutting, Carbon Arc, Plasma Arc, and Oxyfuel. This will be an overview of the three cutting types. Another course in this program will cover cutting processes in much more detail. There will also be a discussion over basic metal shaping during the MIG and TIG welding processes.

This week at a glance:

Lectures:

[Carbon Arc Cutting Set Up and Inspection](#) - 18 Slides

[Plasma Arc Cutting Set Up](#) - 19 Slides

[Oxyfuel Cutting Set Up](#) - 19 Slides

Videos:

[Metal Shaping for Beginners: MIG, TIG Welding](#) - 35 Minutes

Assignment:

Module 14 Quiz - 6 Questions



14.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Content:

Lectures:

[Carbon Arc Cutting Set Up and Inspection](#) - 18 Slides

[Plasma Arc Cutting Set Up](#) - 19 Slides

[Oxyfuel Cutting Set Up](#) - 19 Slides

Videos:

[Metal Shaping for Beginners: MIG, TIG Welding](#) - 35 Minutes



14.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week's assignment:

Module 14 Quiz - 6 Questions



14.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.



14.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the question and respond to at least one other student's answer to foster discussion.



14.6 Module Wrap-Up

Concept Goals:

By the end of this week, you should be able to:

- **Describe the differences between Plasma Arc, Carbon Arc, and Oxyfuel Cutting (SLO 5)**
- **Demonstrate knowledge of cutting and shaping techniques (SLO 5)**

Concept Content:

This week we went over the cutting and shaping processes. Next week, will be our final exam.

This week at a glance:

Lectures:

[Carbon Arc Cutting Set Up and Inspection](#) - 18 Slides

[Plasma Arc Cutting Set Up](#) - 19 Slides

[Oxyfuel Cutting Set Up](#) - 19 Slides

Videos:

[Metal Shaping for Beginners: MIG, TIG Welding](#) - 35 Minutes

Assignment:

Module 14 Quiz - 6 Questions - Due by **(insert due date there)**.

Module 15 - Final Exam

15.1 Final Exam

Concept Goals:

Demonstrate an understanding of the course material.

Concept Content:

The final exam is located in the assignments tab under quiz.

There are 48 Questions **(instructor note: this can be adjusted as you can pick and choose which questions to use)**.

15.2 Course Wrap-Up

Concept Content:

Thank you for your participation in this course. It has been wonderful getting to work with you all.

Faculty Resources (For Instructor Only, Do Not Publish Live)

 **Odigia Guide**

Concept Content:

Click on the resources tab to find the guide sheet for instructors.

 **Welding Safety Violation Poster Answer Key**

Concept Content:

Here is the answer key to the module 1 assignment: Welding Violations Example Poster

[Welding Safety Poster Answer Key](#)