



COURSE OUTLINE : WELD 118
D Credit – Degree Applicable
COURSE ID 001546
Cyclical Review: September 2020

COURSE DISCIPLINE : WELD
COURSE NUMBER : 118
COURSE TITLE (FULL) : General Welding
COURSE TITLE (SHORT) : General Welding
ACADEMIC SENATE DISCIPLINE: Welding

CATALOG DESCRIPTION

WELD 118 consists of theory and techniques in basic Shielded Metal Arc Welding (SMAW) and Flux Cored Arc Welding. The student is given experience in applying the principles by individual practice on a sequence of selected plates and manipulative exercises on mild steel.

Total Lecture Units: 1.00

Total Laboratory Units: 1.00

Total Course Units: 2.00

Total Lecture Hours: 18.00

Total Laboratory Hours: 54.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 72.00

Total Out-of-Class Hours: 36.00

Prerequisite: WELD 117 or equivalent.



ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1	WELD	117	Introduction To Welding	Perform oxy-fuel welding in all positions and oxy-fuel cutting and brazing, plasma arc cutting;	Yes
2	WELD	117	Introduction To Welding	demonstrate a knowledge of safety precautions involved in the proper use of oxy-fuel and related equipment;	Yes
3	WELD	117	Introduction To Welding	evaluate and critique the finished welding exercises;	Yes
4	WELD	117	Introduction To Welding	perform destructive and non-destructive testing on specific weld joints done in all positions;	Yes
5	WELD	117	Introduction To Welding	communicate a working knowledge of the use of general shop equipment such as: band saw, drill press, metal cutting shears, radiograph cutter, pedestal and portable grinders, electric wire brush, and various hand tools.	Yes

EXIT STANDARDS

- 1 Perform shielded metal arc welding and flux cored arc welding of heavy plate;
- 2 complete the proper testing sequence of electric grinding, coupon cutting, and destructive root bend testing of the weld samples;
- 3 critique and evaluate the finished exercises;
- 4 write a materials list and complete a sketch for an optional final project;
- 5 communicate a working knowledge of the use of general shop tools.

STUDENT LEARNING OUTCOMES

- 1 utilize welding safety and avoid practices that could pose a danger to others;
- 2 demonstrate set-up and adjust settings on welding machines;
- 3 perform flat welding position using ARC/MIG processes in completing class exercises.



COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	<p>Electric Welding</p> <ul style="list-style-type: none"> • Definition, classification of welding by arc • Polarity, arc blow, and problems in resistance welding • AC and DC arc welders • Color identification of rods • Stress relief, inspection • Types of welded joints • Maintenance of welders 	6	0	6
2	<p>Thermit Welding</p> <ul style="list-style-type: none"> • Definition – reaction of thermit • Procedures, outfit 	3	0	3
3	<p>Unionmelt Welding</p> <ul style="list-style-type: none"> • Developed and uses of unionmelt welding 	3	0	3
4	<p>Resistance Welding Application</p> <ul style="list-style-type: none"> • Air operated spot, mechanical techniques • Types and uses 	3	0	3
5	<p>Gas Welding of Pipe</p> <ul style="list-style-type: none"> • Joint preparation, cutting and beveling • Position welds, vertical, backing plates • Spacing tables 	3	0	3
6	<p>Welding Pressure Vessels</p> <ul style="list-style-type: none"> • Procedures, techniques of checking 	0	4	4



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7	<p>Welding Aluminum</p> <ul style="list-style-type: none"> • Commercial methods, arc, inert, metallic • Oxyacetylene and oxy-hydrogen • Resistance, spot, soldering (hard and soft) 	0	6	6
8	<p>Welding Copper</p> <ul style="list-style-type: none"> • Kind of copper to use • Methods, acetylene, arc, inert-arc 	0	6	6
9	<p>Welding Brass and Bronze</p> <ul style="list-style-type: none"> • Procedure, yellow brass, machine brass 	0	5	5
10	<p>Airplane Welding</p> <ul style="list-style-type: none"> • Welding processes • Oxyacetylene welding procedure 	0	5	5
11	<p>Ultrasonic Weld Inspection</p> <ul style="list-style-type: none"> • Explanation of the methods, sound cycles, reflections, testing • A.B. and C. scans, frequency modulated flaw detection systems 	0	6	6
12	<p>Surface Hardening</p> <ul style="list-style-type: none"> • Definition • Quenching, steels, hardening operation, various methods • Equipment 	0	5	5



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13	<p>Hard Facing</p> <ul style="list-style-type: none"> • Oxyacetylene procedure, electric arc procedures • Hardness of deposit 	0	4	4
14	<p>Study of High Frequency Induction Heating</p> <ul style="list-style-type: none"> • Resistance produces heat, heating units • Types of inductive heating, high frequency application 	0	4	4
15	<p>A.W.S. standard welding symbols</p> <ul style="list-style-type: none"> • Standard location of elements of a welding symbol • General provision, location of symbols dimensioning 	0	3	3
16	<p>Metals</p> <ul style="list-style-type: none"> • Study of 26 basic metals used in the metals industry • Physical properties • Testing and identification of the metals 	0	3	3
17	<p>Use of Testing Equipment</p> <ul style="list-style-type: none"> • Rockwell, its application to Brinnell • Hardness, tensile strengths, etc. 	0	3	3
				72

OUT OF CLASS ASSIGNMENTS

- 1 lab simulations;
- 2 written assignments;
- 3 homework assignments.

METHODS OF EVALUATION



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- 1 five regularly scheduled one-hour examinations;
- 2 one two-hour final examination (written and objective);
- 3 twenty-one regularly scheduled practical tests for each area covered in class-lab section.

METHODS OF INSTRUCTION

- Lecture
- Laboratory
- Studio
- Discussion
- Multimedia
- Tutorial
- Independent Study
- Collaboratory Learning
- Demonstration
- Field Activities (Trips)
- Guest Speakers
- Presentations

TEXTBOOKS

Title	Type	Publisher	Edition	Medium	Author	ISBN	Date
Welding Fundamentals	Required	Goodheart-Willcox	5	print	Bowditch, William A.	978-1-63126-328-6	2017