Prepared: Dave Holley Approved: Corey Meunier

Course Code: Title	WLD121: WELDING
Program Number: Name	5082: MECH.TECH.IND.MAINT.
Department:	IRONWKR APPR./WELDING RELATED
Semester/Term:	17F
Course Description:	A trades curriculum that has been designed to provide students with a combination of theoretical knowledge and hands-on skill in relation to the safe use and operation of both OFG/SMA welding, cutting and heating equipment.
Total Credits:	2
Hours/Week:	2
Total Hours:	30
Substitutes:	CCT121, MET100
This course is a pre-requisite for:	WLD200
Vocational Learning Outcomes (VLO's): **Please refer to program web page for a complete listing of program outcomes where applicable.**	#1. Complete all work in compliance with current legislation, standards, regulations and guidelines. #10. Select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.
Essential Employability Skills (EES):	#4. Apply a systematic approach to solve problems. #5. Use a variety of thinking skills to anticipate and solve problems. #10. Manage the use of time and other resources to complete projects. #11. Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 50%, D
Other Course Evaluation & Assessment Requirements:	1. 1 Late hand-in penalties will be -10% per day. Assignments will not be accepted past one week late unless there are extenuating and legitimate circumstances (as determined by instructor). 2. If a student misses a test/lab he/she must have a valid reason (i.e. medical or family emergency documentation shall be required). In addition, the instructor MUST be notified

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PRIOR to the test or lab sitting. If this procedure is not followed the student will receive a mark of zero on the test/lab with no make-up option.
3. Re-writes are NOT allowed for any written assignment, quiz or test.
4. Repeats are NOT allowed for any shop test.
5. Course attendance is mandatory. One percent (1 %) per hour will be deducted from the final course grade for unexcused* absence.

Any absence without a written, valid reason will be deemed unexcused.

Valid reasons would include:
Doctors note
Family Death or Serious Illness supported by a written note.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Shop Assignments	65%
Theory Test	35%

Books and Required Resources:

ILM Welding Bundle *A* (OXY/OXY/SMA/MILD/WEL) by Alberta ILM
Publisher: AK Graphics

Course Outcomes and Learning Objectives:

Course Outcome 1.

A trades curriculum that has been designed to provide students with a combination of theoretical knowledge and hands on skill in relation to the safe use and operation of both OFG / SMA welding, cutting and heating equipment

Learning Objectives 1.

Upon successful completion of this course, the student will demonstrate the ability to:

1. Personal Protective Equipment for Oxy-Fuel Gas Welding Cutting and Heating Operations.
Potential Elements of the Performance:

- identify proper eye, hand and face protection
- identify proper footwear and clothing
- identify and select filter lenses
- describe the effects of exposure to infra red radiation
- locate and identify shop ventilation controls

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- locate and identify emergency exits
- locate and identify manifold shut-off valves for the shop gas system
- understand emergency shop evacuation procedures

2. Construction of Oxygen Acetylene and other Fuel Gas Cylinders.
Potential Elements of the Performance:

- describe the physical construction of both acetylene and oxygen cylinders
- locate and identify the built-in safety devices for both acetylene and oxygen cylinders
- identify both acetylene and oxygen cylinders, hoses, regulators and fittings
- identify basic physical properties and dangers associated with the use of acetylene gas
- identify basic physical properties and dangers associated with the use of oxygen gas
- describe proper procedures for cylinder handling
- pressurize and purge regulators, hoses, torch body and tips
- explain the dangers associated to the hazards of backfire and flashback
- explain the correct safe response to backfire and flashback
- perform specified procedures for flame ignition and adjustment

3. Observe Demonstrations of the Braze Welding and Fusion Welding Processes c/w their Required Equipment.
Potential Elements of the Performance:

- observe and identify fusion welding and braze welding equipment to include:

o gas supply (cylinders vs manifold lines)
o regulators
o hoses
o torch handles
o welding tips
o filler metals
o face and eye protection

- observe procedures for setting up, pressurizing, purging and shutting down oxyacetylene welding equipment
- describe potential fire, fume and explosion hazards associated with the welding, flame cutting and heating of metals
- observe and identify common welding techniques to include:

o base metal cleaning and preheating
o fusion welding of a mild steel bead and joint
o destructive testing of same
o braze welding of a mild steel bead and joint
o destructive testing of same

- complete a ‘Demonstration Report Form’ on the above course material

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4. Perform Flame Cutting Operations on Mild Steel.
- observe and identify flame cutting equipment to include:

o gas supply (cylinders vs manifold lines)
o regulators
o hoses
o torch handles
o cutting tips
o face and eye protection

- observe procedures for setting up, pressurizing, purging and shutting down oxyacetylene flame cutting equipment
- perform a routine inspection of individual workstation to determine the condition of the torch body, hoses, regulators and tips
- correct / report workstation deficiencies prior to the commencement of shop assignments
- perform flame cutting exercises on mild steel to include

o square cut a straight line
o square cut an ‘S’ shaped line
o bevel cut a straight line
o pierce mild steel and cut holes

5. Arc Welding Terms and Equipment.
Potential Elements of the Performance:
- Define or describe the following terms

o Fusion
o Penetration
o Leg Size
o Profile
o Defect / Discontinuity

- Describe the Basic Principles behind each of the following:

o SMAW Process
o Welding Current and Polarity
o AC and DC Welding Machines
o Arc Blow

6. CAS and AWS Classification of SMAW Electrodes.
Potential Elements of the Performance:
- identify, select electrodes by

o Classification
o Diameter
o Desired Weld Appearance

- Identify and select the correct operating current for electrodes based upon

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	o Diameter o Joint Design o Required Strength • Identify the correct storage and handling procedures for each of the following electrode types o Low Hydrogen o Non-Low Hydrogen 7. Arc Welding Operations. Potential Elements of the Performance • adjust SMAW equipment and settings according to the demands of single and multi-pass fillet and groove welds • deposit single and multi-pass fillet welds on mild steel, in the flat position • identify and troubleshoot the cause(s) of weld defects • identify and explain limited repair and service activities related to electrode cables, holders, welding machines and protective equipment
Date:	Friday, September 1, 2017
	Please refer to the course outline addendum on the Learning Management System for further information.