

- COURSE DESCRIPTION:** This curriculum is based upon the Welding Curriculum designed for Heavy Equipment and Truck Coach Apprentices and approved by the Ministry of Training, Colleges and Universities. No changes should be made to it without prior examination of the specific Learning Outcomes / Content of the Ministry document.
- I.**
- II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

1. ***Identify equipment and procedures required to assure personal safety while engaged in shop activities.***

Potential Elements of the Performance:

- identify proper eye protection as well as the need to wear it at all times while in the welding shop
- identify proper hand and face protection as well as the need to wear it during any and all cutting, heating or welding operations
- identify proper footwear and clothing
- identify the dangers associated with contact lenses, butane lighters, exposed metal jewelry, long hair and beards
- identify the location of commonly used welding tools, face shields and leather jackets
- identify personal safety equipment that must be supplied by the student
- locate and identify shop lighting and ventilation controls
- locate and identify emergency shop exits
- understand emergency shop evacuation procedures
- locate and identify manifold shut-off valves for the shop gas system

2. ***Describe the functions, construction features, types and application of oxyacetylene heating and cutting equipment.***

Potential Elements of the Performance:

- identification and general construction of cylinders
- pressure regulators
- manual valves
- manifold systems
- gages, hoses and torch body
- tip design based upon cutting, heating and welding operations
- cutting attachments
- flashback arrestors

3. ***Describe the principles of safe operation, care and maintenance of oxyacetylene heating and cutting equipment.***

Potential Elements of the Performance:

- cylinders
- pressure regulators
- manual valves
- manifold systems
- gages, hoses and torch body
- tips used for
 - cutting
 - heating
 - welding
- cutting attachments
- flashback arrestors
- manufacturer's instructions for proper equipment care and maintenance

4. ***Perform basic heating and cutting procedures following manufacturer's recommendations and perform assigned operations***

Potential Elements of the Performance:

- identify and select cutting, welding and heating tips based upon metal thickness and the manufacturer's recommendations
- select operating gas pressures based upon the torch manufacturer's recommendations
- perform a routine inspection of individual workstation to determine the condition of the torch body, hoses, regulators, threaded connections and tips
- ensure that all deficiencies are corrected prior to the commencement of shop activity
- 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
- identify and adjust gas flow in order to create
 - neutral flame
 - carburizing flame
 - oxidizing flame
- perform specified procedures for cleaning and shutting down their individual workstations
- remove damaged or broken fasteners
- perform heating and removal procedures of seized fasteners

5. ***Identify and Install Bolts and Bolts Assemblies to include...***

Potential Elements of the Performance:

- identify and select bolts, nuts and washers according to specified grade
- correctly install and tighten a specified bolt assembly
- explain the negative effect of dirt and foreign material on threads while torque is applied to the bolt assembly
- explain the need to replace bolts whenever called for by the manufacturer's maintenance procedures
- explain the potential for failure of a bolted connection due to ...
 - oversized thru holes
 - combining the elements various bolt grades
 - using under strength bolts
 - repeated exposure to excessive heat

III. TOPICS:

1. Personal and Shop Safety
2. Construction and Safe Handling of Acetylene and Oxygen Gas Cylinders.
3. Setup and Operation of a Typical Oxyacetylene Workstation.
4. Bolts and Bolted Assemblies.
4. Flame Cutting and Heating Operations.

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- CSA Approved (Impact Resistant) Safety Glasses
- CSA Approved (8 inch High Cut) Safety Work Boots
- CSA Approved (Gauntlet Type) Welding Gloves
- Appropriate Work Wear (see 'Welding Shop Guidelines)
- Pocket Note-pad (for shop demonstrations)
- Modules: Oxyfuel Equipment # 120101g
Oxyfuel Cutting # 120101i

V. EVALUATION PROCESS/GRADING SYSTEM:

The final course grade will be determined by means of the following list of weighted factors

| <i>Factor</i> | <i>Weight</i> |
|--------------------------|----------------------|
| Shop Assignments | 75 % |
| Theory Assignment / Test | 25 % |

The following grades will be assigned to students.

| Grade | <u>Definition</u> | <i>Grade Point Equivalent</i> |
|--------------|--|--------------------------------------|
| A+ | 90 – 100% | 4.00 |
| A | 80 – 89% | 3.00 |
| B | 70 - 79% | 2.00 |
| C | 60 - 69% | 1.00 |
| D | 50 – 59% | 0.00 |
| F (Fail) | 49% and below | |
| CR (Credit) | Credit for diploma requirements has been awarded. | |
| S | Satisfactory achievement in field /clinical placement or non-graded subject area. | |
| U | Unsatisfactory achievement in field/clinical placement or non-graded subject area. | |
| X | A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course. | |
| NR | Grade not reported to Registrar's office. | |
| W | Student has withdrawn from the course without academic penalty. | |

VI. SPECIAL NOTES:

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 493 so that support services can be arranged for you.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

<include any other special notes appropriate to your course>

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.