WE117

Welding Technology

2 Credits

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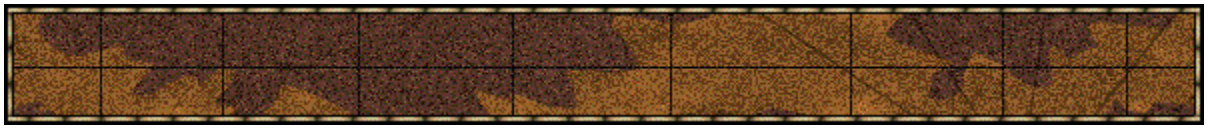

Welding Technology

Calendar Description

This course follows the Alberta Apprenticeship and Industry Training Welder Curriculum. Welding technology requires a broad skill set, and knowledge of techniques and procedures necessary to accomplish a successful weld. Students gain these skills through theory and lab practical procedures.

Rationale

This is a required course for Pre-employment Welding students. Pre-employment programs provide students with an opportunity to obtain both practical and theoretical experience in a trade and thus an avenue of entry into the workforce.

Prerequisites

None

Co-Requisites

MA116, SA120, WE115, WE118, WE119 and WE135

Course Learning Outcomes

Upon successful completion of this course, students will be able to

A. **read and interpret drawings.**
   1. identify the alphabet of lines.
   2. explain the purpose of drawings.
   3. identify elements and information found on drawings.
   4. interpret symbols, views and sections used on drawings.
   5. identify SI metric and imperial dimensioning.

B. **describe electrical concepts.**
   1. define electrical terms.
   2. describe electron flow.
   3. describe single-phase and three-phase power.
   4. describe AC and AC-DC rectified power sources.

5. describe AC and DC generator power sources.
6. describe multi-process inverter power sources.
7. describe welding power source installation and maintenance.

C. **identify types of metals and their characteristics.**
1. identify metals by visual appearance, colour, relative weight, typical shape and texture.
2. describe chip, spark, file hardness and flame tests.
3. interpret information supplied on mill test reports.
4. describe the mechanical properties of metals.
5. describe the physical properties of metals.

D. **identify the effects of heat treatment on carbon steels.**
1. define heat-affected zones in metals.
2. explain the difference between heat and temperature.
3. explain the three forms of heat transfer.
4. describe the effects of expansion and contraction.
5. describe the purpose and effects of preheat and postheat.
6. describe the practices of heat treatment.
7. explain the principle of temperature-indicating devices

E. **identify joints and weld types.**
1. identify the five basic joints.
2. describe the types of welds and their dimensions.
3. identify joint and weld type variations.
4. outline the considerations in the design of a joint for welding.

F. **interpret welding symbols.**
1. explain the purpose of welding symbols.
2. define weld symbol, welding symbol and supplementary symbols.
3. interpret weld symbols and welding symbols.
4. identify the dimensioning of welding symbols.
5. interpret non-destructive testing symbols.

G. **identify distortion and methods of control.**
1. identify how heat and temperature relate to distortion.
2. identify the three types of distortion, their causes and control of each type.
3. describe the mechanical, procedural and design methods of controlling distortion.

H. **identify weld faults.**
1. define the classifications of weld faults.
2. define the notching effect.
3. identify weld faults, their causes and methods of prevention.

I. **observe hardfacing of steel.**
1. describe the hardfacing process and applications.
2. identify the types of wear.
3. identify filler metals for hardfacing.
4. identify the problems associated with hardfacing and how to avoid them.
5. describe the procedures for applying hardfacing materials with filler wires.

Resource Materials

Modules for First Period Welder program from Alberta Learning, Apprenticeship and Industry Training Division.

120102A, 120102B, 120102C, 120102D, 120102E, 120102F, 120102G, 120102H and 120102I

Conduct of Course

Welding Technology consists of 50 hours of interactive learning within specific modules, utilizing power point presentations, smart board technology; as well as numerous props that are used to support the literature discussed. Specific objectives are stated in each class and information resulting from the lectures is introduced and further enhanced while performing practical shop assignments. Students are given the opportunity to complete a variety of exercises and evaluations to assist in learning. The instructor is available for individual and/or group help during class and scheduled office hours.

Lakeland College is committed to the highest academic standards. Students are expected to be familiar with Lakeland College lab polices and to maintain respect for shop equipment and environment and to abide by these policies. Violations of these policies are considered to be serious and may result in suspension or expulsion from the College.

Evaluation Procedures

Students are expected to complete multiple choice exams after the completion of each module lectured. At the conclusion of this section, a final evaluation will be issued and consist of 50% of the final mark for Welding Technology. Students are required to have a 65% passing grade at the end of the 4th week of attendance to continue on in the program. At the conclusion of the course, a minimum of 65% average is required to write the 1st period Apprenticeship & Industry Training exam.

Module Exams	50%
Final Exam	50%

Grade Equivalents and Course Pass Requirements

A minimum grade of C+ is required to pass this course.

Letter	F	C+	B-	B	B+	A-	A	A+
Percent Range	0-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	2.30	2.70	3.00	3.30	3.70	4.00	4.0

Attendance

Regular attendance is essential for success in any course. Absence for any reason does not relieve a student of the responsibility of completing course work and assignments to the satisfaction of the instructor. Poor attendance may result in the termination of a student from a course. The instructor will recommend that any student who does not meet the established attendance requirements to withdraw from the course. In cases of repeated absences due to illness, the student may be requested to submit a medical certificate. Students that miss a total of 27 hours within the duration of the pre-employment program, will be scheduled to appear before the college chair to review their status, at which time dismissal from the program may be an option. Instructors have the authority to require attendance at classes.

Course Units/Topics

Section II

Module – 120102a - Drawing Interpretation.

Module – 120102b – Electricity.

Module – 120102c – Metal Identification.

Module – 120102d – Heat Treatment.

Module – 120102e – Joints and Weld Types.

Module - 120102f – Welding Symbols.

Module – 120102g – Distortion.

Module – 120102h – Weld Faults.

Module – 120102i – Hardfacing

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