



# COURSE OUTLINE

## TCT711

Prepared: Sylvain Belanger Approved:

<b>Course Code: Title</b>	TCT711: TRADE PRACTICES AND AUXILIARY SYSTEMS
<b>Program Number: Name</b>	6081: T/C TECHN LEVEL II
<b>Department:</b>	IRONWKR APPR./WELDING RELATED
<b>Semester/Term:</b>	18S
<b>Course Description:</b>	Upon successful completion the apprentice is able to perform down-hand welding repairs and installations on vehicle chassis components, and identify the characteristics of sound welds using electric arc and on mig welding process, is able to use manufacturers service literature, personal computers and networks to locate service and parts information, and understand networking protocols of OEM Intranet data hubs, is able to repair vehicle cab components and fixtures to the manufacturers and statutory standards, and is able to describe the different types of truck and coach rig configuration used in highway applications, and access information to determine legal vehicles by weight, height and length.
<b>Total Credits:</b>	4
<b>Hours/Week:</b>	0
<b>Total Hours:</b>	32
<b>Essential Employability Skills (EES):</b>	<p>#2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>#3. Execute mathematical operations accurately.</p> <p>#4. Apply a systematic approach to solve problems.</p> <p>#5. Use a variety of thinking skills to anticipate and solve problems.</p> <p>#6. Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>#7. Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>#10. Manage the use of time and other resources to complete projects.</p>
<b>General Education Themes:</b>	Science and Technology
<b>Course Evaluation:</b>	Passing Grade: 50%, D
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p>Theory testing 60%</p> <p>Practical application testing 40%</p> <p>Grade</p>

Definition Grade Point Equivalent

A+ 90 - 100% 4.00

A 80 - 89%

B 70 - 79% 3.00

C 60 - 69% 2.00

D 50 - 59% 1.00

F (Fail) 49% and below 0.00

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.

**Evaluation Process and Grading System:**

<b>Evaluation Type</b>	<b>Evaluation Weight</b>
practical application testing	60%
theory testing	40%

**Books and Required Resources:**

Heavy Duty truck systems by Sean Bennett

Publisher: cengage Edition: 6

ILM Welding Bundle \*C\* (SM/MIL/WELD/GMA/GAS) by Alberta Government

Publisher: AK Graphics

**Course Outcomes and Learning Objectives:**

## **Course Outcome 1.**

Upon successful completion, the apprentice is able to perform downhand welding repairs and installations on vehicle chassis components and identify the characteristics of sound welds using electric arc and MIG welding process.

## **Learning Objectives 1.**

Upon successful completion, the apprentice is able to:

1.1.1 Explain the purpose and fundamental of shielded metal arc, MIG and TIG welding.

[1/0]

- electricity
- electrical circuit theory
- transformers
- rectifiers
- basic metallurgy

1.1.2 Identify the functions, construction, composition, types, styles and application of shielded metal arc, MIG and TIG welding.

[3/0]

- comparison Arc vs. MIG welding
- AC welding transformers
- DC rectifiers
- arc welding cables
- electrode holders
- AWS electrode and wire classifications
- transformers
- rectifiers

- MIG welding plant
- MIG shielding gases
- MIG gun cooling
- MIG welding cable and liner

1.1.3 Describe the principle(s) of operation shielded metal arc, MIG and TIG welding procedures.

[3/0]

- AC welding transformers
- DC rectifiers
- arc Welding Polarity
- open circuit voltage
- closed circuit voltage
- electrode and wire coding interpretation
- welding characteristics of electrode and wire types
- destructive and non-destructive weld testing
- analysis of welded coupons
- wire speed factors
- voltage control factors
- MIG transfer methods
- short circuit
- spray transfer
- Tungsten Inert Gas (TIG)

1.1.4 Perform basic welding using Electric Arc, MIG and TIG welding equipment.

[0/12]

- electric arc and MIG welding on mild steel
- electrode and wire selection
- lap welds
- fillet welds
- butt-welds
- flat (down hand) welding techniques

Demonstrate:

- vertical and horizontal welding techniques
- arc and MIG welding equipment cleaning and maintenance
- TIG application

1.1.5 Recommend reconditioning or repairs following manufacturers'™ procedures on shielded

metal arc, MIG and TIG welding.

[1/1]

- identify personal care and MIG welding safety equipment requirements
- high voltage electrical safety hazards
- identify types of steel by testing and application
- analyze failed welds for cause
- identify personal are and MIG welding safety equipment requirements
- high voltage electrical safety hazards
- identify types of steel by testing and application
- analyze failed welds for cause
- review requirements for structural and repair welds on truck and coach chassis
- identify pressure vessels and non-repairable components
- review explosion hazards safety
- protecting electronic and mechanical components from arcing damage

## **Course Outcome 2.**

Upon successful completion, the apprentice is able to use manufacturer's service literature, personal computers and networks to locate service and parts information and understand networking protocols of OEM Intranet data hubs.

## Learning Objectives 2.

Upon successful completion, the apprentice is able to:

1.2.1 Explain the purpose, functions and application of Information Accessing and Communications Systems

[1/0]

- introduction to the personal computer (PC), device names and designations
- data retention
- software management formats
- directory
- file naming
- copy
- delete
- rename

1.2.2 Create letters and reports using a PC (personal computer) and universal software programs.

[0/1]

- introduction to word processing programs
- menu structure
- naming / saving conventions
- search / replace
- documentation
- page layout
- copy/move
- file/merge/browsed spreadsheets
- uses of Internet
- OEM intranet systems

1.2.3 Describe how spreadsheet and word processing software is used in service facilities and how to manage information.

[0/1]

- electronic spreadsheets
- menu structure
- naming / saving conventions
- documentation
- spreadsheet layout
- copy / move
- file / merge / browse
- search / replace

1.2.4 Demonstrate effective online networking skills and navigate the Internet to search service-related information.

[1/1]

- network etiquette
- web browsers
- search engines
- downloading
- e-mail
- attachment
- links
- hyperlinks

- data hub access
- file sharing software
- threaded discussions
- using Wikis

### **Course Outcome 3.**

Upon successful completion, the apprentice is able to repair vehicle cab components and fixtures to the manufacturer and statutory standards.

### **Learning Objectives 3.**

Upon successful completion, the apprentice is able to:

1.3.1 Explain the functions, construction and application for Cabs and Control Systems.

[2/0]

- weather stripping
- interior and exterior trim fasteners, adhesives, and retainers
- window and regulators
- glazing
- headlamps
- bumpers
- wipers and controls
- Seats
- Supplemental Restraint System (SRS)
- Rollover Restraint Systems (RollTek)
- mirror assemblies
- latches, handles and linkages
- hood assemblies
- door assemblies
- fire suppression
- interlock systems
- school bus safety
- transit bus safety
- trailer and tanker unload safety

1.3.2 Identify inspection and testing and adjustment procedures for cabs and control systems

[0/2]

- fit (water and dust tight)
- appearance
- noise location and repair (squeak and rattle)
- headlamp alignment
- interlock system (school bus safety)
- hood assemblies
- door assemblies
- wipers and controls
- supplemental restraint systems
- rollover restraint systems
- mirrors assemblies

### **Course Outcome 4.**

Upon successful completion, the apprentice is able to describe the different types of truck and coach rig configuration used in highway applications and access information to determine legal vehicles by weight, height and length.

## Learning Objectives 4.

Upon successful completion, the apprentice is able to:

1.4.1 Explain the purpose and fundamentals of truck rig configurations and articulating coaches.

[0.5/0]

- articulation
- bridge formula

1.4.2 Identify the functions, types, styles and application of tractor-trailer configurations and articulating coaches.

[0.5/0]

- A, B, C and D trains
- full- and semi-trailers
- articulation
- upper couplers
- coupling mechanisms
- steerable and self-steering / lift axles
- articulated transit buses
- class designations of buses

1.4.3 Describe the factors and principles of:

[1/0]

- bridge formula
- weight over axle calculations
- Gross Vehicle Weight Rating (GVWR)
- Gross Combined Weight Rating (GCWR)
- rig designation
- total vehicle length
- statutory lane sizing
- statutory length and height sizing

**Date:**

Tuesday, April 24, 2018

Please refer to the course outline addendum on the Learning Management System for further information.