# COURSE OUTLINE: TCT811 - TRADE PRAC AUX SYS

Prepared: Sylvain Belanger
Approved: Corey Meunier, Chair, Technology and Skilled Trades

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| **Course Code: Title** | TCT811: TRADE PRACTICES AND AUXILIARY SYSTEMS |
| **Program Number: Name** | 6082: T/C TECHN-LEVEL III |
| **Department:** | MOTIVE POWER APPRENTICESHIP |
| **Semesters/Terms:** | 20F |
| **Course Description:** | Trade practices is designed to provide the theory and practical training to enable the student to describe the Regulatory Requirements of the Highway Traffic Act and how it applies to employers and employees involved in Repair Service and operation of On Highway Commercial Vehicles. The course content deals with the safe operating conditions that apply to the mechanical components on commercial vehicles and equipment falling under both the Federal and Canadian Motor Vehicle Standards Acts. Students will learn the provisions and the meaning of FMVSS and the CMVSA limits and Standards for Out Of Service Criteria inspections for On Highway Commercial Vehicles and Towing Equipment. Course content will also cover newer electronic systems involving Collision Warning Equipment and Lane Guidance Systems. Students will be taught about the Heating Ventilation and Air Conditioning Systems used in On Highway Truck and Coach Vehicles. |
| **Total Credits:** | 3 |
| **Hours/Week:** | 3 |
| **Total Hours:** | 24 |
| **Prerequisites:** | There are no pre-requisites for this course. |
| **Corequisites:** | There are no co-requisites for this course. |
| **Essential Employability Skills (EES) addressed in this course:** | EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.<br>EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.<br>EES 3 Execute mathematical operations accurately.<br>EES 4 Apply a systematic approach to solve problems.<br>EES 5 Use a variety of thinking skills to anticipate and solve problems.<br>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.<br>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.<br>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.<br>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.<br>EES 10 Manage the use of time and other resources to complete projects.<br>EES 11 Take responsibility for ones own actions, decisions, and consequences. |

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.

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| **Course Evaluation:** | Passing Grade: 50%, D<br><br>A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation. |
| **Other Course Evaluation & Assessment Requirements:** | Grade<br>Definition Grade Point Equivalent<br>A+ 90 - 100% 4.00<br>A 80 - 89%<br>B 70 - 79% 3.00<br>C 60 - 69% 2.00<br>D 50 - 59% 1.00<br>F (Fail)49% and below 0.00<br><br>CR (Credit) Credit for diploma requirements has been awarded.<br>S Satisfactory achievement in field /clinical placement or non-graded subject area.<br>U Unsatisfactory achievement in field/clinical placement or non-graded subject area.<br>X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.<br>NR Grade not reported to Registrar`s office.<br>W Student has withdrawn from the course without academic penalty. |
| **Books and Required Resources:** | Heavy Duty Truck Systems by Bennett<br>Publisher: Cengage Learning Edition: 6th |

**Course Outcomes and Learning Objectives:**

| Course Outcome 1 | Learning Objectives for Course Outcome 1 |
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| Explain the purpose and fundamentals of truck and coach HVAC theory. | - thermodynamics<br>- heat transfer<br>- climate control systems<br>- temperature and relative humidity relationship<br>- change of state, latent and sensible heat<br>- properties of refrigerants<br>- gas laws, temperature, pressure and volume<br>- storage<br>- purchasing<br>- recovery<br>- disposal<br>- legal Issues<br>- environmental effects of refrigerant |
| **Course Outcome 2** | **Learning Objectives for Course Outcome 2** |
| Identify the functions, construction, composition, types, styles and application of truck and coach HVAC theory and reefer systems. | - climate control systems<br>- reefer circuit components<br>- heating and ventilation<br>- electronic<br>- mechanical<br>- cycling clutch systems<br>- orifice tube<br>- expansion valve<br>- identify types of refrigerants<br>- OEM Recommended |

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| | - alternate<br>- lubricants<br>- system control devices<br>- zone control<br>- data bus communication<br>- flow control valves<br>- system protection devices<br>- APADS<br>- low temperature / pressure<br>- high temperature / pressure<br>- expansion valves and orifice tubes<br>- clutch controls<br>- condensers<br>- receiver dryer<br>- accumulator-dryer<br>- evaporator<br>- heater cores compressors<br>- axial recirculating<br>- radial<br>- variable displacement<br>- hoses, lines and fittings<br>- van insulation requirements |
| **Course Outcome 3** | **Learning Objectives for Course Outcome 3** |
| Describe the principle(s) of operation of truck and coach HVAC systems. | - AC system operation<br>- climate control<br>- temperature controls<br>- airflow management<br>- characteristics of refrigerants<br>- characteristics of lubricants<br>- system protection devices<br>- low and high-pressure cutout<br>- low charge protection<br>- low pressure cycling control<br>- compressor cycle<br>- cycling clutch<br>- variable displacement<br>- reefer system operation<br>- cryogenic systems |
| **Course Outcome 4** | **Learning Objectives for Course Outcome 4** |
| Perform inspection, testing and diagnostic procedures on truck and coach HVAC systems. | - identify the location of system components and controls<br>- performance test<br>- heating system<br>- AC system<br>- climate control<br>- test for refrigerant and coolant leaks<br>- test system for operating pressure and control functions<br>- outline service requirements of various refrigerants |
| **Course Outcome 5** | **Learning Objectives for Course Outcome 5** |
| Recommend reconditioning | - outline procedures required removing and replacing HVAC |

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| | or repairs following manufacturers` procedures on truck and coach HVAC systems. | system components<br>- perform drive belt adjustments<br>- demonstrate recovery, recycling, evacuation<br>- recharging procedures |
| | **Course Outcome 6** | **Learning Objectives for Course Outcome 6** |
| | Explain the legal responsibilities as applied to Government Legislation for relevant workplace activities. | - Highway Traffic Act<br>- CVOR (Commercial Vehicle Operator` s Registration)<br>- vehicle safety inspection<br>- legal liability<br>- Out of Service Criteria (OOS)<br>- Commercial Vehicle Safety Alliance (CVSA)<br>- Federal Motor Vehicle Safety Standards (FMVSS)<br>- Canadian Motor Vehicle Safety Act (MVSA)<br>- technical standard documents<br>- American Trucking Association<br>- recommended practices (R.P)<br>- Technical and Maintenance Council (TMC)<br>- Society of Automotive Engineers (SAE)<br>- J-standards<br>- consumer protection legislation |

**Evaluation Process and Grading System:**

| Evaluation Type | Evaluation Weight |
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| Assignments/Theory | 10% |
| Shop Assigned Tasks | 20% |
| Tests/Theory | 70% |

**Date:** September 2, 2020

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