SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	Motive Power Mobile Air Conditioning and Refrigeration Theory/Lab/Shop		
CODE NO. :	MPT204	**SEMESTER:**	THREE
PROGRAM:	Motive Power Technician – Advanced Repair		
AUTHOR:	Stephen Kent		
DATE:	August 2012	**PREVIOUS OUTLINE DATED:**	September 2011
APPROVED:	*"Corey Meunier"*		_____
	CHAIR		**DATE**
TOTAL CREDITS:	FOUR		
PREREQUISITE(S):	MPF 103		
HOURS/WEEK:	5 hours per week theory 2 hours per week lab/shop		

For additional information, please contact Corey Meunier, Chair
School of Technology & Skilled Trades
(705) 759-2554, Ext. 2610

I. COURSE DESCRIPTION:

Upon successful completion, the student will be able to understand the principles of operation, diagnose and repair Truck and Coach, Automotive, and Heavy Duty Equipment, heating, ventilation and air conditioning systems (HVAC) to manufacturer and environmental safety standards.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Explain the purpose and fundamentals of HVAC theory.

Potential Elements of the Performance:

- thermodynamics
- heat transfer
- climate control systems
- temperature and relative humidity relationship
- change of state, latent and sensible heat
- properties of refrigerants
- gas laws, temperature, pressure and volume
- storage
- purchasing
- recovery
- disposal
- legal Issues
- environmental effects of refrigerant

2. Identify the functions, construction, composition, types, styles and application of Truck and Coach, Automotive and Heavy Equipment HVAC theory and reefer systems.

Potential Elements of the Performance:

- climate control systems
- reefer circuit components
- heating and ventilation
- electronic
- mechanical
- cycling clutch systems
- orifice tube
- expansion valve
- identify types of refrigerants
- OEM Recommended
- alternate
- lubricants
- system control devices

- zone control
- flow control valves
- system protection devices
- low temperature / pressure
- high temperature / pressure
- expansion valves and orifice tubes
- clutch controls
- condensers
- receiver dryer
- accumulator-dryer
- evaporator
- heater cores compressors
- axial recirculating
- radial
- variable displacement
- hoses, lines and fittings
- van insulation requirements

3. Describe the principle(s) of operation of Truck and Coach, Automotive and Heavy Equipment HVAC systems.

Potential Elements of the Performance:

- heating system operation
- AC system operation
- climate control
- temperature controls
- airflow management
- characteristics of refrigerants
- characteristics of lubricants
- system protection devices
- low and high-pressure cutout
- low charge protection
- low pressure cycling control
- compressor cycle
- cycling clutch
- variable displacement
- reefer system operation
- cryogenic systems

4. Perform inspection, testing and diagnostic procedures on Truck and Coach, Automotive and Heavy Equipment HVAC systems.

Potential Elements of the Performance:

- identify the location of system components and controls
- performance test
- heating system

- AC system
- climate control
- test for refrigerant and coolant leaks
- test system for operating pressure and control functions
- outline service requirements of various refrigerants

5. Recommend reconditioning or repairs following manufacturers' procedures on Truck and Coach, Automotive and Heavy Equipment HVAC systems.

Potential Elements of the Performance:

- outline procedures required removing and replacing HVAC
- system components
- perform drive belt adjustments
- demonstrate recovery, recycling, evacuation
- recharging procedures

III. TOPICS:

1. Fundamentals of the refrigeration cycle.
2. Identify the functions, construction, composition, types, styles and application of Truck and Coach, Automotive and Heavy Equipment HVAC theory and reefer systems.
3. Describe the principle(s) of operation of Truck and Coach, Automotive and Heavy Equipment HVAC systems.
4. Perform inspection, testing and diagnostic procedures on Truck and Coach, Automotive and Heavy Equipment HVAC systems.
5. Recommend reconditioning or repairs following manufacturers' procedures

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Automotive Technology-A Systems Approach – 2nd Canadian Edition
Erjavec-Restoule-Playter

Heavy Duty Truck Systems 5th Edition
Bennett-Norman

V. EVALUATION PROCESS/GRADING SYSTEM:

The final grade for this course will be based on the results of classroom, assignments and shop evaluations weighed as indicated:

- Classroom – 40% of the final grade is comprised of term tests.
- Assignments – 10% of the final grade is comprised of a number of technical reports or assignments.
- Shop – 50% of the final grade is comprised of attendance, punctuality, preparedness, student ability, work organization and general attitude.

(Student will be given notice of test and assignment dates in advance)

The following semester grades will be assigned to students:

Grade	**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.

VI. SPECIAL NOTES:

Attendance:
Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.

Cell phones are not allowed in the classrooms or shop areas during class time.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.