



CROCUS PLAINS REGIONAL SECONDARY SCHOOL

Course Outline

Course Title: AUB40S - Vehicle Systems Part 1

Teacher: Mr. J. Kasprick

Course Description: A student wanting to develop skills in the automotive industry must have knowledge of the operation of the automotive electronic and control systems. Students' knowledge in electrical systems will be further enhanced by learning about the principles of ignition, control and communications systems. The student will be able to diagnose, service and repair ignition, control, and communications systems.

General Learning Outcomes:

Students who successfully complete this course will be able to:

- Describe the purpose of ignition systems.
- Describe diagnose and repair the components of a variety of ignition systems.
- Describe the operation of a variety of ignition systems.
- Describe the purpose of a variety of vehicle control systems (e.g. Supplemental Restraint Systems, ABS, traction control,
- Describe the components of a variety of vehicle control systems.
- Describe the operation of a variety of vehicle control systems.
- Describe the purpose of a variety of vehicle data communication systems (e.g. CANBUS, multiplexing)
- Describe the components of a variety of vehicle data communication systems (e.g. CANBUS, multiplexing)
- Describe the operation of a variety of vehicle data communication systems (e.g. CANBUS, multiplexing)

Course Evaluation Structure:

- Theory-30%
- Practical Assignment/Projects-30%
- Final Evaluation-30%
- Employability Skills-10%

Academic Achievement:

The final mark for term work, within the respective categories, (tests, assignments, labs, and projects) will be cumulative. Grades will be calculated on summative assessment information only. The final calculation will be a fair reflection of a student's achievement of the learning outcomes.

Assessment Guidelines:

There are various purposes for assessment:

- Assessment *for* learning (**formative assessment**): where assessment helps teachers gain insight into what students understand in order to plan and guide instruction, and provide helpful feedback to students.
- Assessment *as* learning (**formative assessment**): is characterized by students reflecting on their own learning and making adjustments so that they achieve deeper understanding.
- Assessment *of* learning (**summative assessment**): where assessment informs students, teachers and parents, as well as the broader educational community, of achievement at a certain point in time in order to celebrate success, plan interventions and support continued progress.

Unit Descriptions

Unit Title	1. Computer System Fundamentals		Time: hours
Specific Learning Outcomes	• Compare computer systems to the human body's nervous system. • Describe the input, processing, and output sections of a basic computer system. • Summarize computer system signal classifications. • Sketch a block diagram for a computer system. • Explain input sensor and output device classifications and operation. • Summarize where computers, sensors, and actuators are typically located. • Explain how a computer uses sensor inputs to determine correct outputs.		
Assessment Plan	Formative Assessment <u>Assessment may include:</u> • Discussion • Practical project	Summative Assessment • Unit assignment • Unit test • Practical Test	

Unit Title	2. Control Systems		Time: hours
Specific Learning Outcomes	• Identify the major parts of a typical anti-lock brake system. • Describe the operation of anti-lock brake systems. • Compare anti-lock brake design variations. • Describe the purpose and operation of traction control and stability control systems. • Define the fundamental terms relating to automotive emission control systems. • Explain the sources of air pollution. • Describe the operating principles of emission control systems. • Compare design differences in emission control systems. • Explain how a computer or engine control module can be used to operate emission control systems. • Explain the operation of exhaust gas sensors as a primary control of exhaust emissions and engine air-fuel ratio control. • Summarize how OBD II systems use multiple oxygen sensors to check air-fuel mixture and catalytic converter efficiency. • Explain how vehicle body and frame construction works with restraint systems to protect a vehicle's occupants. • Describe the purpose of restraint systems. • Identify and locate the most important parts of vehicle restraint systems. • Describe restraint system design variations.		
Assessment Plan	Formative Assessment <u>Assessment may include:</u> • Discussion • Practical project	Summative Assessment • Unit assignment • Unit test • Practical Test	

Unit Title	3. Ignition Systems Time: hours	
Specific Learning Outcomes	• Explain the operating principles of any type of automotive ignition system. • Sketch the primary and secondary circuits of an ignition system. • Identify and describe the function of major ignition system components. • Describe the purpose of secondary wires in an ignition system. • Compare ignition coil, spark plug, and ignition circuit variations. • Compare simple contact point systems with electronic ECM-controlled ignition systems. • Distinguish between distributorless and direct ignition systems. • Explain the need for accurate ignition timing control. • Describe the three basic methods used to control ignition system spark timing.	
Assessment Plan	<u>Formative Assessment</u> <u>Assessment may include:</u> • Discussion • Practical project	<u>Summative Assessment</u> • Unit assignment • Unit test • Practical Test