DEPARTMENT OF HEAVY EQUIPMENT PROGRAMS

COURSE OUTLINE – WINTER SEMESTER 2

HE 2400 ELECTRONICS FUEL MANAGEMENT – 6.5(100 HOURS/18 WEEKS) 30 LECTURE -70 LAB/SHOP

INSTRUCTOR:	Gavin Winter	**PHONE:**	780 835 6695
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OFFICE HOURS:	Monday to Friday		

PREREQUISITE(S)/COREQUISITE: English 20-1, English 20-2 or equivalent

Math 20-1, Math 20-2, Math 20-3 or equivalent

A 20-level Science or equivalent

Although a high school diploma is not required for entrance to this program, students should be aware that some employers may require a High School Diploma as a prerequisite to employment.

Applicants who do not meet these requirements may be admitted to the program but they will be required to pass the Apprenticeship & Industry Training (AIT) Trades Entrance Exam during the first semester, if choosing to pursue an apprenticeship.

REQUIRED TEXT/RESOURCE MATERIALS: 1st and 2nd Period Heavy Equipment Technician ILM Modules

CALENDAR DESCRIPTION:

Retrieve and interpret basic diagnostic information from a typical diesel engine

electronic control system. Identify and explain components of electronically controlled fuel injection systems. Diagnose and service electronic controlled diesel fuel injection systems.

CREDIT/CONTACT HOURS: 6.5 Credits – 100 Contact Hours – 5 hours per week

DELIVERY MODE(S): Instructor led classroom theory (30 hours), instructor led lab/shop (70 hours).

OBJECTIVES (OPTIONAL): The program has been developed to provide students with entry level skills as a Heavy Equipment Technician. After obtaining a requisite number of hours in the work force, the student would be eligible to continue with Alberta Apprenticeship and Industry training in the Heavy Equipment Technician trade towards journeyman certification.

TRANSFERABILITY: None

GRADING CRITERIA: A grade of 65% or higher is required to pass this course. Students must complete all required courses with a grade point average of no less than 2.0 and no failing (F) grades.

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	**4-point Equivalent**	**Percentage Guidelines**	**Designation**
A+	**4.0**	**90 – 100**	**EXCELLENT**
A	**4.0**	**85 – 89**	
A-	**3.7**	**80 – 84**	**FIRST CLASS STANDING**
B+	**3.3**	**77 – 79**	
B	**3.0**	**73 – 76**	**GOOD**
B-	**2.7**	**70 – 72**	
C+	**2.3**	**67 – 69**	**SATISFACTORY**
C	**2.0**	**65 – 66**	
F	**0.0**	**60 – 64**	**FAIL**
F	**0.0**	**55 – 59**	
F	**0.0**	**50 – 54**	
F	**0.0**	**0 – 49**	
WF	**0.0**	**0**	**FAIL, withdrawal after deadline**

EVALUATIONS:

Theory portion will be made up of quizzes and tests worth 35%.
Shop portion will be made up of shop projects worth 65%.

Students who have successfully completed the program and also completed an acceptable Alberta Apprenticeship Prior Learning Assessment Application (fee payable to Alberta Apprenticeship) may have the opportunity to challenge the Alberta

Apprenticeship and Industry Training (AIT) first and second year Heavy Equipment Technician apprentice exam.

STUDENT RESPONSIBILITIES:

Please refer to the Student Rights and Responsibilities policy in the Grande Prairie Regional College Calendar or at www.gprc.ab.ca/downloads/documents/StudentRightsandResponsbilities.pdf

STATEMENT ON PLAGIARISM AND CHEATING:

Please refer to pages 49-50 of the College calendar regarding plagiarism, cheating and the resultant penalties. These are serious issues and will be dealt with severely.

COURSE SCHEDULE/TENTATIVE TIMELINE:

A. Electronic Fuel System Fundamentals 24Hours
Outcome: Retrieve and interpret basic diagnostic information from a typical diesel engine electronic control system.
1. Explain the operation of a computer controlled fuel injection system.
2. Explain the operation of engine sensors that measure pressure, temperature, speed, fluid level, and throttle position.
3. Explain integral warning, shutdown and fault codes systems used with electronic controls.
4. Demonstrate the use of a Personal Computer (PC) and other appropriate tools for electronic system interface.
5. Demonstrate the adjustment of electronic fuel control system parameters.

B. Electronically Controlled Fuel Injection Systems ..... 40 Hours
Outcome: Identify and explain components of electronically controlled fuel injection systems.
1. Explain the operation of an electronic unit fuel injection system.
2. Explain the operation of a HEUI fuel injection system.
3. Explain the operation of a common rail fuel injection system.
4. Explain the operation of an electronic unit pump fuel injection system.

C. Performance Analysis and Tune-Up 36Hours
Outcome: Diagnose and service electronic controlled diesel fuel injection systems.
1. Explain the benefits of maintaining engine adjustments.
2. Explain engine performance testing and demonstrate diagnosis.
3. Diagnose and repair an electronic fuel control system malfunction.
4. Demonstrate removal and installation procedures of an electronic fuel pump or injector.