DEPARTMENT OF HEAVY EQUIPMENT

THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – FALL 2014

SEPTEMBER 2 – OCTOBER 24, 2014

HES321 ENGINE FUEL SYSTEMS – 3.0 (88 HOURS)

INSTRUCTOR:	Harry Frykas	**PHONE:**	780.835.6795
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OFFICE HOURS: 8.00am to 4.30pm

PREREQUISITE(S)/COREQUISITE: Successful completion of Semesters 1 and 2.

REQUIRED TEXT/RESOURCE MATERIALS:

Caterpillar Material

Fuel Systems

Unit 1: Caterpillar Fuel Selection, Contamination Control and Conservation

- Lesson 1: Fuel Selection and Maintenance
- Lesson 2: The Basics of Fuels

Unit 2: Fuel Calibration and Nozzle Testing

- Lesson 1: Gauge Testing Demonstration
- Lesson 2: Fuel and Gauge Testing Lab
- Lesson 3: Introduction to Nozzles and Fuel Lines
- Lesson 4: Fuel Nozzle Testing

Unit 3: Governors and Fuel Systems

- Lesson 1: Governors and Early Scroll Fuel Systems
- Lesson 2: New Scroll Fuel System
- Lesson 3: Hydraulic Fuel Ration Control
- Lesson 4: 3406B/C Timing Advance Unit
- Lesson 5: Sleeve Metering Fuel System

Unit 4: 1.1 and 1.2 Mechanical Unit Injection Systems

Lesson 1: Introduction to 1.1 and 1.2 MUI Systems

Lesson 2: MUI Governors

Lesson 3: Injector Synchronization

Lesson 4: Fuel Settings

Lesson 5: Fuel Injector Timing

Unit 5: Introduction to 1.1 and 1.2 HEUI Fuel Systems

Lesson 1: Introduction to 1.1 and 1.2 HEUI Fuel Systems

Unit 6: EUI Fuel System

Lesson 1: EUI Fuel System

Unit 7: 3054/3056, Nippondenso and Zexel Fuel Systems

Lesson 1: 3054 and 3056 Fuel Systems

Lesson 2: Nippondenso and Zexel Fuel Systems

Alberta Apprenticeship and Industry Training Individual Learning Modules Heavy Equipment Technician (HET)

190203a – Diesel Fuel and Storage Tanks (Machine & Bulk Storage)

190203b – Combustion Process and Starting Aids

190203c – Fuel System Service

190203d – Basic Mechanical Fuel Injection System

190203e – Advanced Mechanical Fuel Injection Systems

190203f – Basic Diesel Engine & Fuel System Testing & Adjusting

190203g – Emergency Shutdown Systems

190204a – Electronic Fuel System Fundamentals

190204b – Electronically Controlled Fuel Injection Systems

190204c – Electronic Fuel System Diagnosis

190204d – Emission Control/After Treatment Systems

CALENDAR DESCRIPTION: With a focus on Caterpillar fuels systems, this course will examine: diesel fuel and storage, combination processes, starting aids, the fuel injection system, system service, fuel nozzles and injectors, tune-up and engine performance analysis, and emergency shutdown systems. Electronic fuel and engine management systems will be emphasized.

Delivery Option: Fairview Campus Only

CREDIT/CONTACT HOURS: Credits: 3.0 / Contact Hours: 88.

DELIVERY MODE(S): Lecture and lab**.**

TRANSFERABILITY: None.

GRADING CRITERIA: Students must complete all required courses with a grade point average of no less than 2.7 and no failing (F) grades. A passing grade in this course is a **minimum of 70%.**

Engine Fuel Systems ..... 88 / 240 hours = 37 % of Semester 3 mark

Exams Average = _____ **x 45%**

Class Assignments/Quizzes = _____ **x 30%**

Shop Total _____ **x 25%**

HES321 FINAL MARK = _____ %

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**	
F	**0.0**	**67 – 69**	**FAIL**
F	**0.0**	**63 – 66**	
F	**0.0**	**60 – 62**	
F	**0.0**	**55 – 59**	
F	**0.0**	**50 – 54**	
F	**0.0**	**0 – 49**	
WF	**0.0**	**0**	**FAIL, withdrawal after the deadline**

STUDENT RESPONSIBILITIES:

This is an adult education environment. Enrolment at Grande Prairie Regional College assumes that the student will become a responsible citizen of the College. As such, each student will display a positive work ethic, take pride in and assist in the maintenance and preservation of Institute property, and assume responsibility for his/her education by researching academic requirements and policies, demonstrating courtesy and respect toward others; and respecting instructor expectations concerning attendance, classroom and shop rules, safety, assignments, deadlines and appointments. Students are learning skills to prepare them for the work environment.

Following the guidelines in "Student Rights and Responsibilities" in the GPRC College calendar assist us all in maintaining an adult learning environment. Please refer to the Student Rights and Responsibilities policy in the Grande Prairie Regional College Calendar or at www.gprc.ab.ca/downloads/documents/StudentRightsandResponsibilities.pdf.

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the Student Conduct section of the GPRC Calendar at http://www.gprc.ab.ca/programs/calendar/ Pages 44 to 46 or the College Policy on Student Misconduct: Plagiarism and Cheating at http://www.gprc.ab.ca/about/administration/policies/. **

**Note: all Academic and Administrative policies are available on the same page.

COURSE SCHEDULE/TENTATIVE TIMELINE:

- Construct Functioning Circuits with Consideration to Function and Capacity
- HID Lighting
- HVAC Controls
- Entertainment Systems
- On Board Communication Circuits
- Monitoring Circuits and Systems