DEPARTMENT OF HEAVY EQUIPMENT PROGRAMS

COURSE OUTLINE – FALL SEMESTER 1

HE 1500 HYDRAULICS 1 – 3(42 HOURS/16 WEEKS) 12 LECTURE – 30 LAB/SHOP

INSTRUCTOR:	Garry Candy	**PHONE:**	780 835 6728
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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 Period Heavy Equipment Technician ILM Modules

CALENDAR DESCRIPTION:
Explain hydraulic principles. Explain the function of the following hydraulic system components. Explain the function of the following hydraulic components; hydraulic oils, reservoirs, filters, conductors, and heat exchangers. Explain the function and principles of operation of hydraulic system components.

CREDIT/CONTACT HOURS: 3 Credits – 42 Contact Hours – 3 Hours per week

DELIVERY MODE(S): Instructor led classroom theory (12 hours), instructor led lab/shop (30 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. Hydraulic Fundamentals ..... 18 Hours
Outcome: Explain hydraulic principles.
1. Define hydraulic terminology.
2. Using mathematical calculations, explain the hydraulic principles of pressure, force, area, volume, flow rate, cycle times and power.
3. Draw and interpret basic hydraulic schematics.
4. State the safety precautions that must be observed when working with hydraulic systems.

B. Hydraulic System Components: Reservoir, Filters, Hoses and Coolers ..... 8 Hours
Outcome: Explain the function of the following hydraulic system components; hydraulic oils, reservoirs, filters, conductors, and heat exchangers.
1. Explain the properties of hydraulic fluid and the criteria for its selection.
2. State the functions of the hydraulic reservoir and its related components.
3. State the functions and principles of operation of filtration devices.
4. Explain the construction and applications of common types of hydraulic conductors.
5. State the functions and applications of hydraulic heat exchangers.

C. Hydraulic System Components: Pumps, Valves, Cylinders and Accumulators .....16 Hours
Outcome: Explain the functions and principles of operation of hydraulic system components.
1. Explain gear pump operating principles.
2. State the function and principles of operation for a direct acting pressure relief valve.
3. Explain the principles of operation and applications of hydraulic control valves.
4. Explain the principles of operation and applications of basic hydraulic cylinders.
5. Explain the principles of operation and applications of basic hydraulic accumulators.