Department of Motorcycle & Recreational Powersports
PRE-EMPLOYMENT OUTDOOR POWER EQUIPMENT PROGRAM

COURSE OUTLINE – FALL, SEMESTER 1

SM 150 Snowmobile Theory

INSTRUCTOR:	Les Ashton	**PHONE:**	780.835.6687
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OFFICE:	FM6 111	**E-MAIL:**	LAshton@GPRC.ab.ca
	FM6 111		GMoffatt@GPRC.ab.ca
	FM6 111		MGamble@GPRC.ab.ca
OFFICE HOURS:	Monday through Friday. 9:00 a.m. – 5:00 p.m.		

PREREQUISITE(S)/COREQUISITE: None.

REQUIRED TEXT/RESOURCE MATERIALS:

Textbooks:

Bombardier Recreational Product's Guide to Service Fundamentals and Principles *Note: Used in SM 150, 200, 250*	Bombardier
AAEN Clutch Tuning Handbook	Olav Aaen
AAEN Carb Tuning Handbook	Olav Aaen

Optional Textbooks:

Snowmobile Service	Intertec
Snowmobile Manual 11th Edition	Intertec

Other Required Supplies:

- 3-ring binder
- loose leaf paper
- pencils
- calculator (basic)

CALENDAR DESCRIPTION: This course covers the snowmobile from front to back. Topics include: PDI, front and rear suspension, HPG shock rebuild, engine overhaul and failure analysis, carburetion, HAC, DPM, altitude compensators, EFI, snowmobile electrical circuits and components, clutches, tracks, and chain cases. Another snowmobile specific topic covered is: "performance modification" which includes expansion chambers, porting, power valves, compression ratios and turbo chargers.

Delivery Option – Fairview Campus Only

CREDIT/CONTACT HOURS: 4.5 credits; 10 hours per week; 8 weeks; 80 hours.

DELIVERY MODE(S): Instructor led classroom theory.

OBJECTIVES: The Outdoor Power Equipment Technician program has been developed to provide students with entry level skills in the snowmobile equipment technologies.

TRANSFERABILITY: None.

GRADING CRITERIA: Students must complete all required courses with a grade point of 2.0 or higher; a percentage of 63% or higher; a "C" letter grade or higher, and no failing grades. A student must pass each course individually in order to receive a Certificate of Achievement in Pre-Employment Outdoor Power Equipment Technician. Absence for tests will result in a score of zero.

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	63 – 66	
F	0.0	60 – 62	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:

Areas of Evaluation	Percentage of Total Course Mark
Final Exam	40%
Unit Tests	60%

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/StudentRightsandResponsibilities.pdf.

ATTENDANCE REQUIREMENTS:

In addition, attendance will be graded as follows:

- Unavoidable absences should be relayed to the instructor prior to or immediately after the day in concern. If the instructors know the situation, it is easier to be compassionate to individual needs. If you are unable to contact the instructor, a message left at the Mech. 6 Tool Room will alert us to unexpected absences (780.835.6772).
- Note: Attendance is monitored for both shop and theory.
- Student attendance is recorded by the hour.
- If a student is late by 15 minutes = one hour missed.
- Students who are chronically late must meet with the Instructor or the Chair of the program.
- Chronic lateness will not be permitted.
- If six hours are missed the student must meet with the Instructor. A written and signed record of the meeting will be completed. A copy will be given to the student and the instructor will place a copy on the student's file.
- If 12 hours are missed the student must meet with the Chair of the program. A written and signed record of the meeting will be completed. A copy will be given to the student, the instructor and the Chair.
- If 18 hours are missed the student must meet with the Chair of the program again. Disciplinary action will be taken. Such disciplinary action may include, but is not limited to, a penalty assessed to the student's marks, placed on probation, or termination from the program.
- Absence for tests will result in a score of zero.

STATEMENT ON PLAGIARISM AND CHEATING:

Please refer to www.gprc.ab.ca/downloads/documents/Student%20Misconduct%20Plagiarism%20and%20Cheating.pdf regarding plagiarism, cheating and the resultant penalties. These are serious issues and will be dealt with severely.

COURSE SCHEDULE/TENTATIVE TIMELINE:

Week 1 Assembly, PDI, unit identification, parts lookup including aftermarket, track construction and design, traction aids. AC lighting, accessories installation, reading schematics. Operator safety.

Week 2 Front and rear suspension theory of operation. Adjustment, inspection, parts replacement. HPG theory and rebuilding. Steering geometry theory and terms. Steering adjustment and aftermarket accessories.

Week 3 Engine disassembly, inspection, rebuilding, reassembly. Failure analysis. Theory on expansion chambers, porting, power valves, compression ratios, volumetric efficiency. Performance modification products and procedures.

Week 4 Flat and round slide carburetor construction and theory of operation. EFI components and theory of operation and diagnostics. HAC, DPM, turbo charger installation and adjustment, EGT and Air/Fuel monitor installation and usage.

Week 5 Capacitor Discharge ignition systems components and theory of operation. (magneto points ignition is also introduced here to comply with AIT requirements) Ignition related safety interlock systems theory. Introduction to DC charging systems including belt driven type. Electronic reverse.

Week 6 Clutching theory of operation. Primary and secondary clutch inspection, repair, adjustment. Chain case and associated drive parts. Sprocket ratio calculation. Discussion of aftermarket products such as gear drive and belt secondary drive.

Week 7 Tune up, ignition timing theory of operation, high altitude adjustment summary, summer storage, air and liquid cooling systems components and theory of operation, brakes systems mantainance – mechanical and hydraulic.

Week 8 Verify mixture strength by reading spark plug and by using EGT.

Course review.