Department of Motorcycle & Recreational Powersports

PRE-EMPLOYMENT OUTDOOR POWER EQUIPMENT PROGRAM

COURSE OUTLINE – FALL, SEMESTER 1

SM 155 Snowmobile Shop

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: Same as SM 150 Texts.

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:

- clipboard (legal size preferred)
- safety glasses (mandatory)
- suitable shop footwear; not open-toed; (safety footwear recommended)
- pencils
- coveralls (cotton) or shop coat (cotton)
- wireless enabled laptop computer (optional)

CALENDAR DESCRIPTION: This is a hands-on course that supports the theory covered in SM 150. 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. Students will also have the opportunity to work with many specialized tools used in the snowmobile industry.

Delivery Option – Fairview Campus Only

CREDIT/CONTACT HOURS: 9.5 credits; 20 hours per week; 8 weeks; 160 hours.

DELIVERY MODE(S): Workshop projects; procedures; instructor led; hands on.

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: Shop Evaluation includes guidelines listed below.

1. Application of theory to shop practices. **2.** Safety: • organization and cleanliness. • eye protection. • proper procedures. • attitude and adherence. **3.** Use of Service Manuals: • recommended procedures. • special tool usage (as available). • specific information. **4.** Completion of Exercises: • worksheets filled in. • all procedures performed. • participation of all group members. **5.** Cooperation with fellow students, instructors and supervisors.	**6.** Use of Tools and Equipment: • safety and cleanliness. • reporting damage. • proper techniques. **7.** Application of Techniques: • ability to follow instructions. • Are repeat demonstrations required? **8.** Workmanship: • quality of work performed. • proper parts request information supplied. • correct procedure usage. • service procedures performed in a logical and orderly manner. • parts shortage. • time management. **9.** Request assistance when needed/ offer assistance as required.

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.

STUDENT RESPONSIBILITIES: (continued)

- 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	PDI, unit identification, detailing for resale, parts ordering, track clearance measuring. Transporting and lifting in the shop. AC lighting system testing. Reading schematic diagrams.
Week 2	Front and rear suspension disassemble and inspect, reassemble and adjust. HPG shock rebuild. Steering components inspect and adjust.
Week 3	2 – stroke engine disassembly, inspection, reassembly. Inspection of expansion chambers, port matching, and power valves. Measuring combustion chamber volume and calculating compression ratio.
Week 4	Carburetor remove and clean. Cable adjustment and carb synchronize. EFI component identification. EFI trouble shooting. A/F monitor and EGT installation and usage. Turbo charger install and adjust. Engine dynometer testing option.
Week 5	Electrical schematic reading. Capacitor discharge ignition systems testing. Transistorized ignition system familiarization. Ignition related safety interlock devise identification and trouble shooting. DC charging system identification. Belt driven alternator familiarization.
Week 6	Primary and secondary clutch removal, disassembly, inspection and repair. Clutch alignment and adjustment. Chain case, drive shaft, jack shaft and associated parts inspection.
Week 7	Tune up, ignition timing inspection and adjustment on magneto CDI (magneto points system optional), cooling systems inspection and testing, brakes maintenance (mechanical and hydraulic).
Week 8	Job completion, verify correct air/fuel mixture by using EGT and plug reading methods. Prepare for storage.