

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**COURSE OUTLINE**

**COURSE TITLE:** GEARTRAINS I

**CODE NO. :** ASM1150 **SEMESTER:** 2

**PROGRAMS:** MOTIVE POWER – PARTS/COUNTER  
AUTOMOTIVE TECHNICIAN – SERVICE & MANAGEMENT

**AUTHOR:** STEPHEN KENT

**DATE:** March 2003 **PREVIOUS OUTLINE DATED:** Nov. 2000

**APPROVED:**

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**DEAN**

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**DATE**

**TOTAL CREDITS:** 2

**PREREQUISITE(S):** ASM1010 – BASIC AUTOMOTIVE SKILLS

**HOURS/WEEK:** TAUGHT IN BLOCK FORMAT

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*For additional information, please contact Patricia Gibbons, Dean*  
*Apprenticeship & Trades*  
*(705) 759-2554, Ext. 656*

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COURSE NAME

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COURSE NUMBER**I. COURSE DESCRIPTION:**

In this course the student will be able to describe the construction, basic operating principles, servicing and testing techniques of the following gear train systems, clutch assemblies, manual transmission, differentials and drive shafts. The student will also demonstrate their ability to disassemble, test and inspect manual transmissions, differentials and drivelines including gear patterns, driveline angle measurement and phasing.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. Explain the construction, operating principles, testing and service techniques required to repair single and double disc clutch assemblies.

Potential Elements of the Performance:

- Compare & contrast static and sliding friction
- State the effects of centrifugal force
- Describe the construction of single and double disc clutch assemblies
- Test and inspect clutch assemblies with prescribed service tools and equipment
- Perform clutch adjustments following manufactures maintenance procedures

2. Demonstrate a thorough understanding of the construction, operation, testing and servicing of rear wheel drive manual transmissions.

Potential Elements of the Performance:

- Describe the basic operating principles of various manual shift gear boxes
- Discuss the common customer complaints related to various powertrain component failures
- Dismantle and trace powerflows in manual shift transmissions
- Inspect gears and synchronizers for wear and proper operation
- Describe manufacturers system maintenance procedures of manual transmission lubricating fluids

**LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE Continued.....**

3. Describe the function, composition and construction of differentials and drive shafts.

Potential Elements of the Performance:

- Identify the differential and drive axle assemblies employed within the motive power field
- Describe the function and interrelationship of the components of differentials and drive axle assemblies
- Measure driveline angle and phasing using prescribed tools and equipment
- Compare and contrast gears used in motive power drivelines (e.g.) bevel gear, spur gear, helical and hypoid

**III. TOPICS:**

1. Clutches
2. Manual Transmissions
3. Differentials & Driveshafts

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

- Modern Automotive Technology  
 Pen, pencils, calculator, 3-ring binder  
 \* shop coat or coveralls  
 \* CSA approved steel toe boots (high top)  
 \* CSA approved safety glasses  
 \* these items mandatory for shop

**V. EVALUATION PROCESS/GRADING SYSTEM:**

The final grade for this course will be based on the results of classroom, assignments and shop evaluations weighed as indicated:

Classroom – 60% of the final grade is comprised of term tests

Assignments – 10% of the final grade is comprised of a number of technical reports

Shop – 30% of the final grade is comprised of attendance, punctuality, preparedness, student ability, work organization and general attitude (Student will be given notice of test and assignment dates in advance)

COURSE NAMECOURSE NUMBER

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field placement or non-graded subject areas.	
U	Unsatisfactory achievement in field placement or non-graded subject areas.	
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see <i>Policies &amp; Procedures Manual – Deferred Grades and Make-up</i> ).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has not been possible for the faculty member to report grades.	

## VI. SPECIAL NOTES:

### Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

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COURSE NAME

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Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.