



**I. COURSE DESCRIPTION:**

Upon successful completion, the apprentice is able to understand the principles of operation, diagnose and repair pull type clutches and flywheel assemblies; understand the principles of operation, diagnose and repair Multiple Countershaft Manual Transmission and Auxiliary Sections; understand the principles of operation, diagnose and repair Multiple Speed and Double Reduction Drive Axle Assemblies; understand the principles of operation, diagnose and repair Power Divided Tandem Drive Assemblies; understand the principles of operation, diagnose and repair Electronically Automated Standard Transmissions; understand the principles of operation, diagnose and repair Transfer Case, Drop Box and Power Take-Off Assemblies.

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

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

**1. *Pull Type Clutches and Flywheel Assemblies*****Potential Elements of the Performance:**

- Define the purpose and fundamentals of pull type clutches and flywheel assemblies.
- Describe the functions, construction, composition, types, styles and application of pull type clutches and flywheel assemblies.
- Explain the principle(s) of operation of pull type clutches and flywheel assemblies.
- Perform inspection, testing and diagnostic procedures on pull type clutches and flywheel assemblies.
- Recommend reconditioning and repairs.

**2. *Multiple Countershaft Manual Transmissions & Auxiliary Section*****Potential Elements of the Performance:**

- Define the purpose and fundamentals of multiple countershaft manual transmission and auxiliary sections.
- Describe the functions, construction, composition, types, styles and application of multiple countershaft manual transmission and auxiliary sections.
- Explain the principle(s) of operation of multiple countershaft transmission and auxiliary sections.
- Recommend reconditioning or repairs.

**3. Multiple Speed & Reduction Drive Axle Assemblies**Potential Elements of the Performance:

- Define the purpose and fundamentals of multiple speed and double reduction drive axle assemblies.
- Describe the functions, construction, composition, types, styles and application of multiple speed and double reduction drive axle assemblies.
- Explain the principle(s) of operation of multiple speed and double reduction drive axle assemblies.
- Perform disassembly, inspection, testing, diagnostic and reassembly procedures on multiple speed and double reduction drive axle assemblies.
- Recommend reconditioning or repairs.

**4. Power Divided Tandem Drive Assemblies**Potential Elements of the Performance:

- Define the purpose and fundamentals of power divided tandem drive assemblies.
- Describe the functions, construction, composition, types, styles and application of power divided tandem drive assemblies.
- Explain the principle(s) of operation of power divided tandem drive assemblies.
- Perform inspection, testing and diagnostic procedures on power divided tandem drive assemblies.
- Recommend reconditioning or repairs.

**5. Electronically Automated Standard Transmissions**Potential Elements of the Performance:

- Define the purpose and fundamentals of electronically controlled standard transmissions.
- Describe the functions, construction, composition, types, styles and application of electronically controlled standard transmissions.
- Explain the principle(s) of operation of electronically controlled standard transmissions.
- Perform inspection, testing and diagnostic procedures on electronically controlled standard transmissions.
- Recommend reconditioning or repairs.

**6. Transfer Case, Drop Box and Power Take-Off Assemblies**Potential Elements of the Performance:

- Define the purpose and fundamentals of transfer case, drop box and power take-off assemblies.
- Describe the functions, construction, composition, types, styles

and application of transfer case, drop box and power take-off assemblies.

- Explain the principles of operation of transfer case, drop box and power take-off assemblies.
- Perform inspection, testing and diagnostic procedures on transfer case, drop box and power take-off assemblies.
- Recommend reconditioning or repairs.

### III. TOPICS:

1. Pull Type Clutches and Flywheel Assemblies.
2. Multiple Countershaft Transmissions & Auxiliary Sections.
3. Multiple Speed and Double Reduction Drive Axle Assemblies.
4. Power Divided Tandem Drive Assemblies.
5. Electronically Automated Standard Transmissions.
6. Transfer Case, Drop Box and Power Take-Off Assemblies.

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

Prescribed text books outlined at the beginning of the course.

Must have Sault College/CSA safety glasses and steel toe work boots for lab activities as well as coveralls or shop coat.

### V. EVALUATION PROCESS/GRADING SYSTEM:

- **70% of theory testing.**
- **10% shop assignments.**
- **20% Final Exam.**

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	

U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

## 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 professor and/or the Special Needs office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

### 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.

### Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

### Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. 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:**

Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. ADVANCE CREDIT TRANSFER:**

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question.