

I. COURSE DESCRIPTION:

Gear Train Systems is designed for the advanced level training in Heavy Duty Transmissions used in On Highway Commercial Vehicles commonly School & City Buses, Highway Coach, and specialized delivery vehicles for city refuse vehicles. Students will be taught the purpose, construction and operation of the Automatic Transmissions and transmission control devices used for these applications. Students will learn the theory of operation of torque converters both single and double stage and how they develop the power and torque to power the automatic transmissions. Students will also learn the construction, and operation of the internal components and controls of the manual automatic transmissions and the newer electronically controlled transmission. They will be taught how to diagnose and test the external manual and electronic controls as well as the internal manual hydraulic and electronic hydraulically controlled systems. A hands on disassemble and assemble component is also included in the course to give students experience in the intricate design of planetary gearing systems used to achieve multiple gear ratios, speeds and torque output for the appropriate vehicle task.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Define the fundamentals of safe practices and procedures when working with electrical-/hydraulic systems.
2. Define the purpose, construction and operation of the torque converter.
3. Define the construction, and operation of the four and five and six speed automatic transmissions used for medium & heavy duty commercial vehicles.
4. Define the proper type and suggested lubrication fluid for the automatic transmission according to application and MFG Model.
5. Describe the purpose, construction and operation of the electronic control systems of the automatic transmissions.
6. Perform hydraulic and electronic testing for automatic transmissions using Electronic Testing equipment according to Vehicle and Transmission Manufacturer Specifications.

7. Perform proper disassembly and internal component inspection of the components according to Manufacturer Service Manuals and Specifications
8. Perform proper reassembly and adjustment procedures to the automatic transmissions according to the Manufacturers Service Manual and Specifications.

III. TOPICS:

1. Electrical and Electronic fundamentals
2. Heavy Duty Torque Converters
3. Heavy Duty Transmission Power Flow Schematics
4. Planetary Gearing and Hydraulic Control Devices
5. Hydraulically and Electro-Hydraulically Controlled Valve body Assemblies
6. Manual testing and diagnosis, and electronic testing and diagnosis of automatic transmissions, and drive train assemblies and components

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Hand outs provided by instructor as well as text books requested by department as per booklist.

V. EVALUATION PROCESS/GRADING SYSTEM:

Students will be tested on the material covered per apprenticeship curriculum by multiple choice questions, assignments, and practical tests. The weigh factor for each area of testing will be as follows:

Theory Tests	50 %
Practical Tests	30 %
Assignments	20 %

This evaluation can change depending on the emphasis placed on each of the above testing procedures.

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<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:

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services 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:

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.

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