



## El Camino College Course Syllabus

### ATEC 33 Transmissions, Drive Train and Axles

Section # 7270

Instructor Name: *Mr. Anderson*Phone Number: *310-660-3600 ext. 3303*E-mail: *mianderson@elcamino.edu*Class Hours: *Mon.-Thurs. 2:00pm-5:50pm*

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#### Course Description:

This course covers the study of automatic transmissions, manual transmissions, clutch, drive line and drive axle construction and operation. Laboratory activities stress drive train diagnosis, repair, overhaul procedures and the proper use of tools utilized in the field.

Note: This course is the same as the two-course sequence Automotive Technology 34 and 35. Students who have completed Automotive Technology 34 and 35 will not receive credit for Automotive Technology 33.

Recommended Preparation: Automotive Technology 1 or equivalent.

#### Course Objectives:

Upon completion of this module, students will be able to:

- Score 100% accuracy on the safety test.
- Select and use the proper tools and equipment safely and efficiently.
- Explain the difference between transmissions and transaxles.
- Understand basic gear theory and design.
- Evaluate, inspect and test automatic transmission operation.
- Evaluate, service and adjust automatic transmissions.
- Diagnose and repair automatic transmission malfunctions.
- Describe the power flow of the typical 5-speed manual transmission
- Identify possible causes and remedies for manual transmission/transaxle problems
- List the precautions taken when troubleshooting, cleaning, inspecting, and serving these systems
- Explain the functions of U-joints, differential, and axle shafts
- Discuss the procedures involved in servicing the final drive train
- Diagnose and repair drive and/or axle shafts.

**Required Textbooks:**

*Manual Transmissions & Transaxles, 5<sup>th</sup> Edition, Classroom Manual*, Jack Erjavec, Delmar Cengage Learning, ISBN-10: 1-4354-2685-1, ISBN-13: 978-1-4354-2685-6

*Manual Transmissions & Transaxles, 5<sup>th</sup> Edition, Shop Manual*, Jack Erjavec, Delmar Cengage Learning, ISBN-10: 1-4354-2835-8, ISBN-13: 978-1-4354-2835-5

*Automatic Transmissions & Transaxles, 5<sup>th</sup> Edition, Classroom Manual*, Jack Erjavec, Delmar Cengage Learning, ISBN-10: 1-4354-8103-8, ISBN-13: 978-1-4354-8103-9

*Automatic Transmissions & Transaxles, 5<sup>th</sup> Edition, Shop Manual*, Jack Erjavec, Delmar Cengage Learning, ISBN-10: 1-4354-8104-6, ISBN-13: 978-1-4354-8104-6

**Course Content:** Weekly Course Topics*Manual Transmissions and Transaxles*

Week 1: Course Introduction, Safety

- *Safety Test*

Week 2: Manual Drive Train and Axles

- *Chapter 1*

Week 3: Drivetrain Theory

- *Chapter 2*

Week 4: Clutches, Manual Transmissions/Transaxles

- *Chapter 3 & 4*

Exam Ch. 1 & 2 Sept. 16, 2014

Week 5: Front Drive Axles, Drive Shafts and Universal Joints

- *Chapter 5 & 6*

Week 6: Differentials and Drive Axles

- *Chapter 7*

Exam Ch. 3-6 Sept. 30, 2014

Week 7: Four-Wheel-Drive Systems

- *Chapter 8 & 9*

Week 8: Electric and Electronic Drivetrain Systems and Transmissions

- *Chapter 10 & 11*

Exam Ch. 7-9 Oct. 14, 2014

**MIDTERM Manual Transmissions Chapters 1-11 Oct. 21, 2014**

*Automatic Transmissions and Transaxles*

## Week 9: Drivetrain Basics, Transmission Designs

- *Chapter 1 & 5*

## Week 10: Torque Converters and Pumps

- *Chapter 6*

## Week 11: General Theories of Operation

- *Chapter 3* Exam Ch. 1, 5, 6 Nov. 4, 2014

## Week 12: Electronic Controls, Hydraulic Circuits and Controls

- *Chapter 4 & 7*

## Week 13: Gears and Shafts

- *Chapter 8* Exam Ch. 3, 4, 7 Nov. 18, 2014

## Week 14: Reaction and Friction Units

- *Chapter 9*

## Week 15: Common Automatic Transmissions

- *Chapter 10* Exam Ch. 8 & 9 Dec. 2, 2014

## Week 16: Course Review

- *Manual Transmission Ch. 1-11, Automatic Transmission Ch. 1-9*  
Exam Ch. 7-9 Oct. 14, 2014

**Final Exam** *Manual Transmissions Chapters 1-11, Automatic Transmission Ch. 1-9*  
**Thurs. Dec. 11, 2014**

**Instructional Methods:**

The course will be delivered through a variety of methodologies, including the following:

- ♦ Lectures combined with presentations using computer software (PowerPoint), the Internet, and videos/DVDs
- ♦ Interactive discussions in which students will be expected to actively participate
- ♦ Written assignments-Homework
- ♦ Lab/shop assignments
- ♦ Group work/shop activities
- ♦ Bi-weekly Exams, a Midterm and a Final Exam

**Grading Criteria:**

The following grading scale will be used in calculating the final grade:

Homework, Lab Assignments	25%
Exams	25%
Attendance	25%
Final Exam	25%
	100%

**Grading Scale:**

90 – 100%	A
80 – 89%	B
70 – 79%	C
65 – 69%	D
Below 65%	F

**Policies/Procedures:**

- Students must attend class. Cell phone use in class is prohibited. No food in classroom.
- Students are expected to dress and act professionally on a daily basis. Students are also required to follow all safety precautions and requirements while in shop and laboratories.
- NO PARKING IN THE SHOP UNLESS APPROVED BY YOUR INSTRUCTOR.  
TURN OFF ALL Cellular phones, I-pods, MP3, Radios, etc. during class time.
- No smoking inside of the building.
- IT IS THE STUDENTS RESPONSIBILITY TO KEEP THE SHOP AREA CLEAN.

Disability: El Camino College adheres to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations for students with temporary and permanent disabilities. If you have a disability that may adversely affect your work in this class, I encourage you to register with the Special Resource Center (SRC).