



El Camino College Course Syllabus

ATEC 22A Tune-Up/Electrical/Fuel Systems

Section #7264

Instructor Name: *Mr. Anderson*Phone Number: *310-660-3600 ext. 3303*E-mail: *mianderson@elcamino.edu*Class Hours: *Mon., Tues., Wed., Thurs. 7:30am-11:30am*

Course Description:

This is an introductory engine performance course which covers construction and operation of the following systems: electrical charging, cooling, emission controls, fuel and ignition. Laboratory activities stress the proper use of test equipment and repair procedures used in the industry. *Note:* This course is the same as the two-course sequence Automotive Technology 23 and 24. Students who have completed Automotive Technology 23 and 24 will not receive credit for Automotive Technology 22A. Recommended Preparation: Automotive Technology 1 or equivalent.

Student Learning Outcomes:

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

- Given an in class exam, based on readings, classroom discussions and demonstrations, the student will be able to work in the Automotive Shop safely and pass the Automotive Safety Exam with 100% accuracy.
- The student will perform an analysis of an engine using the Automotive Compression/ Cylinder Leakage Test / Vacuum Testing lab worksheet to manufacturer specifications.
- The student will be able to test the performance of an automotive fuel system using the Fuel System Performance Testing Lab Worksheet and manufacturer's specifications. The student will then analyze worksheet data and determine any recommended repairs and/or service required to maintain the engine's fuel system performance to manufacturer specifications.

Required Textbooks:

Automotive Electrical and Engine Performance, 7th Edition, James D. Halderman, Pearson Education Inc., ISBN-10: 0-13-386627-0, ISBN-13: 978-0-13-386627-8

Course Content: Weekly Course Topics

Week 1: Course Introduction, Safety, Electrical Fundamentals

- *Safety Test, Chapters 1, 2 & 3*

Week 2: Electrical Fundamentals (cont.), Automotive Engine Construction and Operation
Review, Automotive Wiring & Wire Repair, Wiring Schematics & Circuit Testing

- *Chapters 3 (cont.), 8 & 9*

Week 3: Circuit Testers & Digital Meters, Magnetism & Electromagnetism

- *Chapters 6 & 11* Exam Ch. 3, 8 & 9 Sept. 10, 2015

Week 4: Batteries, Battery Testing & Service

- *Chapters 15 & 16*

Week 5: Cranking System, Cranking System Diagnosis & Service

- *Chapters 17 & 18*

Week 6: Charging System, Charging System Diagnosis & Service

- *Chapters 19 & 20* Exam Ch. 6, 11, 15-18 Oct. 1, 2015

Week 7: Ignition System Operation & Diagnosis, Oscilloscopes & Graphing Multi-meters

- *Chapters 33 & 7*

Week 8: Temperature Sensors, Throttle Position Sensors

- *Chapters 28 & 29*

Week 9: MAP/BARO Sensors, Mass Air Flow Sensors

- *Chapters 30 & 31* **Midterm Exam** Ch. 3, 6 – 9, 11, 15-20, 28, 29 & 33 Oct. 19, 2015

Week 10: Oxygen Sensors

- *Chapter 32*

Week 11: Fuel Pumps, Lines & Filters, Fuel-Injection Components & Operation

- *Chapters 34 & 35* Exam Ch. 30, 31 & 32 Nov. 5, 2015

Week 12: Fuel-Injection Components & Operation (cont.), Gasoline Direct-Injection Systems

- *Chapters 35 (cont.) & 36*

Week 13: Fuel-Injection System Diagnosis & Service, Electronic Throttle Control System

- *Chapters 38 & 37*

Week 14: Vehicle Emission Standards & Testing

- *Chapter 39*

Exam Ch. 34 - 38 Nov. 25, 2015

Week 15: Emission Control Devices Operation

- *Chapter 40*

Week 16: Final Exam/Course Review

- *Chapters 3, 6 - 9, 11, 15 - 20, 28 - 40*

Final Exam Ch. 3, 6 - 9, 11, 15 - 20, 28 - 40 Dec. 10, 2015

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 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%
<u>Final Exam</u>	<u>25%</u>
	100%

Grading Scale:

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

Holidays (no class): Monday Sept. 7, 2015 Labor Day
Wednesday Nov. 11, 2015 Veterans Day
Thursday Nov. 26, 2015 Thanksgiving

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 anywhere on campus. Period.
- 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).