

IMPERIAL VALLEY COLLEGE

Fall 2013

Manual Transmissions and Power Trains

AUTO 170

Instructor: Jose Luis Perez

Office: 1102

E-mail: joseperez@imperial.edu

Phone: 355-6361

Class begins: August 19, 2013

Ends: December 7, 2013

Times: 7:30-9:00 Mon.

6:30-7:20 Wed.

TEXTBOOK

Modern Automotive Technology by James E. Duffy

COURSE DESCRIPTION

This course provides advanced operation and hands-on experience of electronic injection systems and their sub-assemblies. Students will learn operation and repairs of sensors and actuators on injection systems. This class emphasizes diagnostic procedure and techniques using basic and sophisticated test equipment.

STUDENT LEARNING OUTCOMES

IVC as an institution has adopted five Student Learning Outcomes (SLO's). They are interconnected with each other. They will be inherent throughout this course:

1. Communication
2. Skills
3. Critical Thinking Skills
4. Information Literacy

5. Global Awareness

COURSE GOALS AND OBJECTIVES

Upon successful completion of this course, students will be able to.

- A. Apply safety procedures properly
- B. Understand basic engine construction and operation
- C. Employ Ohm's Law in troubleshooting electrical circuits
- D. List and explain the characteristics of various fuels
- E. Explain how mechanical and electrical fuel pumps operate
- F. Describe different intake manifold designs
- G. List the different instruments used for electrical system testing
- H. Explain how the fuel pressure regulator and fuel injector operate
- I. Explain the purpose of each component of the exhaust system
- J. Explain the function of the positive ventilation system
- K. Explain how the different types of ignition systems operate
- L. Explain the function and operation of various sensors and actuators
- M. Explain the process of engine troubleshooting

STUDENTS WITH DISABILITIES

Any student with a documented disability who may need educational accommodations should notify his/her instructor or the Disabled Student Program and Services (DSPS) office as soon as possible. The DSPS is located in building 2117, the health services building or you may contact at (760) 355-6312. For first aid call the nurse at (760) 337-0300.

STUDENT RESPONSIBILITIES

Each student is required to comply with the schedule established by IVC and the automotive program. Students should attend class each day class is in session. If for any reason a student is absent he/she is responsible for making up any missed work. It is recommended that students call the office to inform the instructor if he/she is ill or bring a doctor's release note. Four tardies= one absence, four absences and you will be dropped from the class or given an incomplete (IC) for the course. It is also recommended for each student to bring a classroom and shop manual along with pencil and paper.

ASSIGNMENTS AND ACTIVITIES

Reviews, videos, laboratory activities, service manual, and hands-on learning for each section the course

GRADING SYSTEM

There will be a mid-term and a final exam. Each will be worth 25% of your grade. Quizzes will also make up 25% of your grade. The last 25% of your grade will be on projects assigned as part of the lab section of the class.

Mid-term: October 7th

Final Exam: December 4th

<u>Percentage</u>	<u>Scores</u>	<u>Letter Grade</u>
25% completed assignments	90-100%	A
25% Quizzes	80-89%	B
25% Mid-term	70-79%	C
25% Final Exam	60-69%	D
	59% and below	F

NOTE: Lecture on chapters will be subject to change

BASIC RULES AND SHOP SAFETY

- No music allowed in the shop
- No parking in front of the gate
- No work should be done without permission from the instructor
- No parking inside the shop during lecture time
- No long breaks (should be 10 minutes per class hour)
- Each should clean his/her work area
- Students cannot leave early without the instructor's permission
- No cell phones during class section
- No helpers or visitors during lab activities
- Safety glasses required during lab hour
- No tolerance for sexual harassment

FALL 2013 IMPORTANT DATES

- Aug. 19 Fall 2013 classes begin
- Sep 2 Labor Day (campus closed)
- Nov.11 Veterans Day (campus closed)
- Nov. 28-30 Thanksgiving (campus closed)
- Dec. 7 Fall 2013 Term Ends

NON-DISCRIMINATION/SEXUAL HARASSMENT

All forms of harassment are contrary to basic standards of conduct between individuals are prohibited by state and federal law. As well as this policy and will not be tolerated. The district is committed to providing an academic and work environment that respects the dignity of individuals and groups. The district shall be free of sexual harassment and all forms of sexual intimidation and exploitation. Emergency number 911 for first aid, nurse (760) 337-0300.

OUTLINES AND ACTIVITIES

WEEK	INTRODUCTION MANUAL	ACTIVITIES/ QUIZ	HOMEWORK/ EXAMS
I	Orientation; Safety	show safety video 1,2,3	video safety test
Part II	Chapter 5 The Auto Shop And Safety	study guide pgs 27-30	review questions pgs. 68-69
2	Chapter 11 Engine Fundamentals	study guide pgs. 145-158 Video: Four stroke Engines	review questions pgs. 159-161
3	Chapter: 8 Fundamentals of Electricity	study guide pgs. 97-108	review questions pgs. 109-110
4	Chapter: 20 Automotive Fields Combustion of Gas Anti-knock qualities Fuel additives Lead Free gasoline Alcohol as a fuel	study guide pgs. 301-312	review questions pg. 312-314

<p>Diesel fuel</p> <p>Liquified Petroleum Gas (LPG)</p>		
<p>Chapter: 21</p> <p>Fuel tanks, pump</p> <p>Lines and filters</p> <p>Fuel supply systems</p> <p>Fuel supply system service</p> <p>Fuel delivery system diagnosis</p> <p>Fuel pumps</p>	<p>study guide</p> <p>pgs. 315-336</p>	<p>review questions</p> <p>pgs. 336-338</p>
<p>Chapter: 22</p> <p>Gasoline</p> <p>Injection fundamentals</p> <p>Throttle body and</p> <p>Multiple injection</p> <p>Hydraulic mechanical injection</p> <p>Fuel injection service</p>	<p>study guide</p> <p>pgs. 340-368</p>	<p>review questions</p> <p>pg. 368-378</p>
<p>Chapter: 27</p> <p>Exhaust systems</p> <p>Mufflers</p> <p>Catalytic converters</p>	<p>study guide</p> <p>pgs. 449-467</p>	<p>review questions</p> <p>ch. 27</p>
<p>Chapter : 43</p> <p>Emission controls</p> <p>Positive Crankcase Ventilation</p>	<p>study guide</p> <p>pgs. 803-828</p>	<p>review questions</p> <p>pg 828-830</p>

<p>Secondary Air Injection</p> <p>Catalytic Converter</p>		
<p>Chapter: 34</p> <p>Ignition System Fundamentals</p> <p>Ignition system operation</p> <p>Specific ignition systems</p>	<p>study guide</p> <p>pgs. 567-591</p>	<p>review questions</p> <p>pg. 591-594</p>
<p>Chapter: 35</p> <p>Ignition system problems</p> <p>Testing and repair</p> <p>Spark plug service</p> <p>Distributor service</p>	<p>study guide</p> <p>pgs. 595-623</p>	<p>review questions</p> <p>pg. 623-626</p>
<p>Chapter: 23</p> <p>Gasoline Injection</p> <p>Diagnosis and repair</p> <p>Fuel pressure regulator service</p> <p>Injector problems</p> <p>Servicing EFI multiport injectors</p> <p>Engine sensor service</p>	<p>study guide</p> <p>pgs. 371-391</p>	<p>review questions</p> <p>pg. 392-394</p>
<p>Chapter: 44</p> <p>Emission Control System</p> <p>Testing service and repair</p> <p>Computer controlled Emission System service</p>	<p>study guide</p> <p>pgs. 831-853</p>	<p>review questions</p> <p>pgs. 854-855</p>

Exhaust gas analyzer State emissions testing program PCV system service		
Chapter: 17,18,19 Computer System Fundamentals Computer control system Components of a computer control sys Electronic control module Operation of sensors and actuators	study guide pgs. 235-294	review questions pgs. 158-260 pgs. 278-281 pgs. 295-297
Chapter: 45 Engine Performance and Driveability Engine performance problems Typical performance problems Engine performance diagnosis	study guide pgs. 859-866	review questions pgs. 866-869
Review and Preparation For Final Exam		