

2012

## Auto 150

Instructor: Jose Lopez/

Office: 1102

Phone:

(760) 355-63-62

Class Begins: August 23, 2012

Ends: Dec 10, 2012

### **Textbook, Workbook and class materials**

Modern Automotive Technology by James E Duffy

Scientific Calculator

### **Course Description**

This course is designed for technicians or students, certified or not, who want to service the automotive electronic circuitry. The course provides a solid core of electronics based on microprocessor technology. Students will diagnose the various systems that include: engine computer control, transmission computer control, suspension antilock brake system, and automotive instrumentation. Upon completing this course, students will be prepared to take the Automotive Service Excellence ASE examinations.

### **Institutional Student Learning Outcomes (ISLO)**

Students Learning Outcomes are written statements that represent faculty and departmental learning goals for students. After successful completion of the program or degree at Imperial Valley College, students are expected to have measurable improvement in the following areas:

- ISLO 1: Communication Skills
- ISLO 2: Critical thinking Skills
- ISLO 3: Personal Responsibility
- ISLO 4: Information Literacy
- ISLO 5: Global Awareness

### **Responsibilities**

Each student is required to comply with the schedule established by Imperial Valley College 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.

## FALL SEMESTER 2012 IMPORTANT DATES AND DEADLINES

**NOTE:** The deadlines below are for full-term classes. Deadlines for short-term classes vary with the length of the class. Most deadlines are mandated in the CA Code of Regulations and are a percentage of the length of the class.

Beginning March 15	New and returning students may file admission application
July 16 – July 30	Priority registration for continuing and re-enrolling students. <b>NEW:</b> Students may register for a maximum of 16 units during the Priority Registration period.
July 30	Registration begins for students new to IVC and continues for current and former IVC students.
July 31	Students on Academic and/or Lack-of-progress Probation may enroll in up to 8 units.
August 6	<b>Unit cap is now increased to 19 units for all students.</b>
August 2	Registration begins for students concurrently enrolled in grades K-12
August 19	Residency determination date
August 20	<b>Classes begin.</b> Beginning on first day each class meets, add authorization code from instructor required to register for that class, filled or open

August 20 – September 1	<b>Late Registration. Beginning on first day each class meets, add authorization code from instructor required to register for that class, filled or open.</b>
***September 1***	<b>Deadline to register for full-term courses</b> <b>Deadline to drop full-term classes without owing fees and/or be eligible for refund.</b> <b>Deadline to select P/NP grading option for courses with that option</b> (see section on <i>Change Grading Options</i> ). Does not pertain to Non-credit Program courses.
September 3	<b>Deadline to drop without course appearing on transcript (without receiving W).</b> Note: fees will be charged and no refunds given for courses dropped on September 2 or 3. See Sept. 1.
September 3	Holiday – Labor Day; no classes

September 4	Census
September 4	Ticketing for parking violations in student spaces on main campus begins. <b>Note:</b> tickets are issued for reserved (faculty/staff), disabled, metered, 15-minute, and no-parking spaces year around.
September 28	<b>Deadline to make up incomplete grade (I) granted Spring or Summer 2012</b>
October 24	Financial Aid Return to Title IV drop deadline.
November 1	<b>Deadline to submit <i>Petition for Graduation</i> for degree to be awarded Fall 2012.</b> Completed petition must be received in Admissions & Records Office by this date. Students must meet with a Counselor and have an evaluation completed and petition signed before this date.
November 12	Holiday – In Honor of Veterans’ Day; no classes.

**\*\*\*November 10\*\*\***      **Deadline to drop full-term classes**

November 22 – 24	Holiday – Thanksgiving – No Classes Thursday, Friday, and Saturday.
December 3-7	Last week of classes including final examinations.
December 10 – January 11	No Classes (College closed December 17 through January 1).
January 14 – May 10, 2013	Spring Semester 2013.
May 11, 2013	Commencement

3 Tardies= 1 Absence

4 Absences= Dropped from course or given an "incomplete"

### Students with Disabilities

Students with a documented disability who may need additional accommodations should notify the instructor and or the Disabled Students Program and Services (DSP&S) office as soon as possible. The DSP&S office is located in room 2117 in the Health Science Building or you may contact them at (760) 355-6312.

### Basic Rules and Shop Safety

No music allowed in the auto shop
No parking in front of the gate
No work should be done without instructor's permission
No parking inside the shop during lecture time
No long breaks ( should be 10 minutes per hour class)
Each student should clean their work area
Students must not leave early without instructor's permission
No cell phones during class sessions
No helpers or visitors during lab activities
Safety glasses required

### 2012 Important Dates

Holidays:	SEPT 6,	NOV 11, 12,	NOV 24-26, 2012
Last week of class including final exam	DEC 6 - 11, 2012		

### Class Schedule

Weeks	Objectives	Lec/Lab	Homework/Exams
1	<b>Course orientation, Review</b> <b>Main points of course</b> ASE preparations ASE assimilation with components Providing with hands-on all electrical/electronic rules and laws	<b>Components:</b> ASE videos and preparations Types of testers Circuit bags Worksheets Use workbook to review chapter 2	Textbook: do ASE review Questions Chapter 2 page 32
2	Equipment, testers, meter and other sources Class bench circuits Vehicle activity Learning styles	Automotive Careers and ASE Certification pages 15-18	

<p><b>3</b> Part I Activity I</p> <p><b>4</b></p>	<p><b>Review Basic Electrical/ Electronics</b> AC and DC current flow, voltage and resistance measurements Ohm's Law Calculations and formulas for serie, parallel and serie-parallel circuits Multimeter interpretations Types of resistors and valves Resistor circuits and measurements Circuit laws and measurements</p>	<p><b>Components:</b> Videos on electrical/ electronic measurements Use elect/elect blue boxes for hands on learning Use Ohm's Law worksheets for circuit activities Use your work book and review Chapter 8 pages 37-40</p>	<p>ASE Booklet Student/Instructor activity with live demonstration</p>
<p><b>5</b> Part II Activity II</p> <p><b>6</b></p>	<p><b>Vehicle Electrical/ Electronic Troubleshooting Short CUT</b> Voltage drop measurement techniques B+ applied B- Voltage drop of the voltage side Voltage drop of the load side Battery troubleshooting Battery drain parasitic draw Battery cranking voltage test Battery load test (battery temp) Battery cranking electronic current test Battery recharge Electron Current test (positive/ground side) Battery voltage bounce back test Test on section</p>	<p><b>Components:</b> Video of voltage drop Use a mock up (alt/starter battery) Explain in detail voltage drop, voltage load Show live components Battery load tester interpretations Battery cables Multimeter ranges Ground and regulators Workbook activity on Batteries: Chapter 29 pages 155-158</p>	<p>ASE preparation booklets</p>
<p><b>7</b> Part I Activity II</p> <p><b>8</b></p>	<p><b>Vehicle Electrical/ Electronic Starter and Alternator Troubleshooting Short Cut</b> Cranking current test Starter draw overview Cranking voltage test Voltage drop of the voltage side Voltage drop of the ground side Voltage drop across Solenoid and Relay circuit Charging Circuit Overview of the charging system Inside and outside of generator</p>	<p><b>Components:</b> Types of starters, solenoids, relays neutral switch Illustrations for voltage drop Multimeter applications Types of alternators Alternator components Alternator circuits Ammeters and connectors</p>	<p>Workbook Activity: Chapter 31 starting system testing and Repair pages 163-170  Chapter 33 Alternators pages 177-182</p>

<p>9</p> <p>10 Part II Activity III</p> <p>11</p> <p>12</p>	<p>circuit (Review) Charging voltage and current flow Types of charging systems Voltage drop on B+ and B- Measuring battery recharge electron current and voltage Alternator ripple voltage test (AC) Alternator scope patterns</p> <p><b>Circuit fault overview</b> Open high or low resistance circuit Short to ground short voltage Closed circuit faults Short to power short component Testing conductors, connections, and contacts Voltage drop and excessive resistance How circuit connections affect voltage drop Relay number or letters identification Relay problems and solenoids Electronic components and semiconductors</p>	<p>Lab scope Videos related</p> <p><b>Components:</b> Video or power point Use blue box to simulate circuit faults Relay and solenoids To identify components Electrical motors</p>	<p>ASE preparation use computer software</p>
<p>Part II</p> <p>13</p> <p>14</p>	<p><b>Computer, Sensors and Actuators</b> Complete reviews Inputs processing and outputs Sensors: coolant, sensor, t.p.s sensor, MAP sensor, O sensor, air temperature sensor, and computer switches Actuators: relays, solenoids, coil switches and motors</p>	<p><b>Components:</b> Videos and worksheets Live sensors Switches, relays and solenoids</p> <p>Workbook Activity: Computer system Chapters 18 &amp; 19 pages 83-88 &amp; 89-94</p>	<p>Textbook homework: Chapters 18 &amp; 19 ASE questions pages 380-381 and 296-297</p>

<p>15</p>	<p><b>Circuit Diagrams</b>          Computer and sensors          Relay solenoids          Charging circuits          Starter circuit          Light circuit          Ignition circuit</p>		
<p>16</p>	<p>Accessories circuit          Door, seat, window circuit          Preparations for ASE &amp; Final exams</p>		

## Automotive Electronics 150

### Bench worksheets and vehicle worksheets

Bench Worksheets	Material Needed	Vehicle Worksheets
Activity I	Activity I	Activity I
AC and Dc voltage current flow measurements	Blue elect Box	AC and DC voltage measurements
Resistor color code box	Multimeter testers	Divide Tests
Types of resistors measurements	Different types of resistors	DC current flow
Resistor circuits for: series parallel, and series parallel	On/Off switch	Ignition system test
Using Ohm's law to calculate and prove valves of series, parallel	Circuit boards	Lamp circuit measurement
Multimeter interpretation	Jumper wires	Alternator and starter flow
Continuity and conductivity	Meter clamp 60 A	Voltage source
Lamp Circuit and Activity measurements	Battery load tester	Alternator voltage drop across the B+ side
voltage drop across + and negative side	Battery temp gauge	Alternator across B- side
Voltage drop of load side	Test light	Voltage drop across the Alternator (load)
		Battery voltage level
		Cranking voltage test
		Battery cranking current flow
		Battery bounce-back test