

### Basic Course Information

|                   |                                  |                     |                                    |
|-------------------|----------------------------------|---------------------|------------------------------------|
| Semester:         | <b>Spring 2015</b>               | Instructor Name:    | <b>David R. Martinez</b>           |
| Course Title & #: | <b>AUT 235</b>                   | Email:              | <b>david.martinez@imperial.edu</b> |
| CRN #:            | <b>20017</b>                     | Webpage (optional): |                                    |
| Classroom:        | <b>1102-3110</b>                 | Office #:           | <b>809</b>                         |
| Class Dates:      | <b>Feb. 17,2015-June12,2015</b>  | Office Hours:       | <b>None</b>                        |
| Class Days:       | <b>Tuesday 1:00-4:10 pm Lab</b>  | Office Phone #:     | <b>760 355-6361</b>                |
| Class Times:      | Thursday 1:00-3:05 pm<br>Lecture | Emergency Contact:  | <b>760 404-9533</b>                |
| Units:            | 3 Units                          |                     |                                    |

### Course Description

*The automotive professional uses different types of electrical/electronic instruments and equipment on a daily basis to troubleshoot and maintain various electronic circuits. This course is designed for technicians or students with little previous automotive electronic training. The testers or instruments can range from a logical test light all the way to a lab scope and anything in between. The student will learn how to use and interpret the most popular electronic equipment to diagnose and repair today's vehicle circuitry. In addition, this course covers the proper procedures for using the correct accessories to repair automotive computer system. Upon completion of this course, the student will have the capability to interpret all electronic signals and be prepared for the use of any electrical/electronic equipment available in the automotive field. (Nontransferable, AA/AS degree only)*

### Student Learning Outcomes

*Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:*

- 1. Identify and interpret Electrical/Electronic systems concern; determine necessary action. (ILO1, ILO2, ILO3)**
- 2. Diagnose electrical/electronic integrity of series, parallel and series-parallel circuits using principles of electricity (OHM's law) (ILO1, ILO2, ILO3)**
- 3. Demonstrate the proper use of a digital multimeter during diagnosis of electrical circuit problems, including: source voltage, voltage drop, current flow, and resistance. (ILO1, ILO2, ILO3)**

## Course Objectives

*Upon satisfactory completion of the course, students will be able to:*

- 1. Comply with all safety lab procedures associated with electrical testers, electrical equipment, and all hazardous materials.*
- 2. Identify the digital/analog multimeter features.*
- 3. Recall and recognize the digital/analog multimeter's interpretation and measurements.*
- 4. Recognize the digital/analog ohmmeter interpretation and measurements.*
- 5. Recognize and interpret semiconductors measurements.*
- 6. Recognize and use electronic meters to measure computer inputs, and sensor output measurements.*
- 7. Recognize and use different testers or equipment to test batteries, stokers and changing system.*
- 8. Examine and interpret electrical/electronic hands-on activities.*
- 9. Examine and interpret automotive hands-on with all available electrical/electronic tester and equipment.*

## Textbooks & Other Resources or Links

*Modern Automotive Technology Book and Workbook*

*Author: James E. Duffy*

*Scientific Calculator*

## Course Requirements and Instructional Methods

*Lectures, Textbook/workbook, assignments, worksheets, video guide, internet information, live demonstrations, quizzes, mid-term, and final test.*

Out of Class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

## Course Grading Based on Course Objectives

*There will be a Mid-term test and a Final Examination. Each will be worth 25% of your grade. Quizzes will make up 25% of your grade. The last 25% of your grade will be based on completion of projects assigned as part of the lab section of the class.*

| <i>Percentage</i>                | <i>Scores</i>        | <i>Letter Grade</i> |
|----------------------------------|----------------------|---------------------|
| <i>25% Completed Assignments</i> | <i>90-100%</i>       | <i>A</i>            |
| <i>25% Quizzes</i>               | <i>80-89%</i>        | <i>B</i>            |
| <i>25% Mid-term exam</i>         | <i>70-79%</i>        | <i>C</i>            |
| <i>25% Final Exam</i>            | <i>60-69%</i>        | <i>D</i>            |
|                                  | <i>Less than 60%</i> | <i>F</i>            |

## Attendance

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See [General Catalog](#) for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

## Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed by the instructor.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the [General Catalog](#).
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.
- No music allowed in the auto shop
- No parking in front of gate
- No work should be done without the instructor permission
- No parking inside the shop during lecture time
- Each student must clean the work area
- Break is only 10 min. per class hour
- Students may not leave early without the instructor's permission
- No helpers or visitor during lab activities
- Safety glasses are required

## Online Netiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and

(11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!)].

## Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- **Plagiarism** is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to "cite a source" correctly, you must ask for help.
- **Cheating** is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the [General Catalog](#) for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

## Additional Student Services

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

- **Blackboard Support Site.** The Blackboard Support Site provides a variety of support channels available to students 24 hours per day.
- **Learning Services.** There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your [Campus Map](#) for the [Math Lab](#); [Reading, Writing & Language Labs](#); and the [Study Skills Center](#).
- **Library Services.** There is more to our library than just books. You have access to tutors in the [Study Skills Center](#), study rooms for small groups, and online access to a wealth of resources.

## Disabled Student Programs and Services (DSPS)

Any student with a documented disability who may need educational accommodations should notify the instructor or the [Disabled Student Programs and Services](#) (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313. Please contact them if you feel you need to be evaluated for educational accommodations.

## Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee.

- [Student Health Center](#). A Student Health Nurse is available on campus. In addition, Pioneers Memorial Healthcare District and El Centro Regional Center provide basic health services for students, such as first aid and care for minor illnesses. Contact the IVC [Student Health Center](#) at 760-355-6310 in Room 2109 for more information.
- [Mental Health Counseling Services](#). Short-term individual, couples, family, and group therapy are provided to currently enrolled students. Contact the IVC [Mental Health Counseling Services](#) at 760-355-6196 in Room 2109 for more information.

## Student Rights and Responsibilities

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC [General Catalog](#).

## Information Literacy

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC [Library Department](#) provides numerous [Information Literacy Tutorials](#) to assist students in this endeavor.

## Anticipated Class Schedule/Calendar

| Week   | Topics  | Teaching Resources               |
|--------|---|----------------------------------|
| Week 1 | Safety Procedures <ol style="list-style-type: none"> <li>1. Personal Safety</li> <li>2. Electrical System Safety</li> <li>3. Electrical Equipment Safety</li> </ol>   | Videos, worksheets, and handouts |
| Week2  | Digital/analog millimeter features <ol style="list-style-type: none"> <li>1. Abbreviations and symbols</li> <li>2. Display and connections</li> <li>3. Range and scales</li> </ol>                            | Videos, worksheets, and handouts |
| Week 3 | Digital/analog voltmeter/ammeter interpretation and measurements <ol style="list-style-type: none"> <li>1. AC/DC voltages and amperage</li> <li>2. Milli volts and kilovolts</li> <li>3. Milliamps</li> </ol> | Videos, worksheets, and handouts |

|         |   |  |
|---------|---|--|
|         | 4. AC/DC current clamp (Low/high current)   |  |
| Week 4  | Digital/Analog ohmmeter Interpretation and measurements<br><ol style="list-style-type: none"> <li>1. Resistance scale and range</li> <li>2. Resistance values</li> <li>3. Resistors on a Circuit board</li> </ol>   | Videos, worksheets, and handouts                                     |
| Week 5  | <ol style="list-style-type: none"> <li>4. Wires, switches, and circuit continuity</li> <li>5. Resistor color and color code values</li> <li>6. Ohm's law and power formulas</li> </ol>  | Videos, worksheets, and handouts                                     |
| Week 6  | Semiconductors Measurements and Interpretation Values<br><ol style="list-style-type: none"> <li>1. Electronic diodes, LEDs and transistors</li> <li>2. Hertz, frequency and revolution/ per minutes</li> </ol>  | Videos, worksheets, and handouts                                     |
| Week 7  | <ol style="list-style-type: none"> <li>3. Pulse width, duty cycle, and dwell</li> <li>4. Kilohertz and capacitance</li> </ol>   | Videos, worksheets, and handouts                                     |
| Week 8  | Digital computer and electronic meters/equipment interpretation and measurements<br><ol style="list-style-type: none"> <li>1. Automotive-oscilloscope and lab scope</li> <li>2. Dual-digital tech advance timing light</li> </ol>   | Videos, worksheets, and handouts                                     |
| Week 9  | <ol style="list-style-type: none"> <li>3. Sensor-simulator and scan tool</li> <li>4. Injector pulse tester and ignition tester</li> <li>5. Chassis ear electronic tester</li> </ol>   | Videos, worksheets, and handouts                                     |
| Week 10 | Battery, starter, and charging system testers<br><ol style="list-style-type: none"> <li>1. Battery charger precaution and operation</li> <li>2. Battery load tester</li> <li>3. Starter/alternator, regular tester and equipment</li> <li>4. Test light, logic probe light and basic tools</li> </ol> | Videos, worksheets, and handouts                                     |
| Week 11 | Electrical/Electronics bench hands-on measurements and reading interpretation<br><ol style="list-style-type: none"> <li>1. Resistors, diodes, transistors</li> <li>2. Relays, coils, elect-motors</li> <li>3. Light circuits and switches</li> </ol>  | Videos, worksheets, and handouts<br>Videos, worksheets, and handouts |

|         |  |                                  |
|---------|--|----------------------------------|
| Week 12 | <ol style="list-style-type: none"> <li>4. Horn, modules and sensors</li> <li>5. Electronic board circuits</li> <li>6. Electronics worksheets using electronic mock-up simulators</li> </ol>                                | Videos, worksheets, and handouts |
| Week 13 | <p>Automotive hands-on measurements and interpretation with electrical/electronics instruments</p> <ol style="list-style-type: none"> <li>1. Charging system circuit</li> <li>2. Battery/starter system circuit</li> </ol> | Videos, worksheets, and handouts |
| Week 14 | <ol style="list-style-type: none"> <li>3. Ignition system circuit</li> <li>4. Computer/sensor system circuit</li> </ol>  | Videos, worksheets, and handouts |
| Week 15 | <b>Preparation for ASE Test</b>  | Videos, worksheets, and handouts |
| Week 16 | <b>Final Exam</b>  | Videos, worksheets, and handouts |

**\*\*\*Tentative, subject to change without prior notice\*\*\***