IMPERIAL VALLEY COLLEGE

Basic Course Information

Semester:	**Spring 2023**	Instructor Name:	**Ricardo Pradis**
Course Title & #:	**Automotive Electronics II**	Email:	**ricardo.pradis@imperial.edu**
CRN #:	**20916**	Webpage (optional):	
Classroom:	**1100 Bldg.**	Office #:	**1100 Bldg.**
Class Dates:	**Feb. 13 – June 9**	Office Hours:	**M- W 5:30- 6:00pm**
Class Days:	**Monday & Wednesday**	Office Phone #:	**760-353-6403**
Class Times:	**6:00 – 7:25 Lec.** **7:25 – 8:50 Lab.**	Emergency Contact:	**760-353-6403**
Units:	**4.00**	Class Format:	**Face to Face**

Course Description

Advanced troubleshooting course for Automotive Service technicians. 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 diagnosis the various systems that include engine computer control, transmission computer control, suspension, anti-lock brake systems, and various automotive instrumentations. Upon completing this course the students will be prepared to take Automotive Service Excellence (ASE) examination in Electronics.

Course Prerequisite(s) and/or Corequisite(s)

None

Student Learning Outcomes

1. Describe the action of basic electric circuits.
2. Compare voltage, current, and resistance.
3. Explain different kinds of automotive wiring.
4. Perform fundamental electrical tests.

Course Objectives

1. Identify the basic of electric current; voltage, current, resistance, conductors, insulators, and Ohm's Law.
2. Identify the use of the semiconductor devices (rectifiers, transistors, amplifiers) and the testing of digital circuits.
3. Identify analog and digital engine control systems; such as, scope patterns, pulse width, duty cycle and frequencies of various electronic components.
4. Identify instrumentation circuits; such as warning devices; accessory displays, automatic switches, and microcomputer circuits.
5. Identify the type of computers and the components that cover computer operations. (Sensor, central processing, input-output signals, and types of computer memories and actuators.)

6. Perform general diagnostic procedures to verify electronic problems; such as, open circuit, short circuit, and continuity. The student will perform many inspections, and testing the following circuits; engine computer, sensors, actuators, electronic transmission, anti-lock brakes, and instrumentation systems.
7. Be familiar with ASE examination requirements, and prepare to successfully pass exam.

Textbooks & Other Resources or Links

Equipment and Supplies:
1. Textbook: Modern Automotive Technology ISBN: 978-1-64564-688-4
2. Personal Protective Equipment:
• Safety glasses, facemask.
• Work footwear.
• Proper shirt and pants.

Course Requirements and Instructional Methods

Methods of instructions may include, but are not limited to, the following: lectures, textbook worksheets, hands-on worksheets, internet readings, large and small group discussions, audiovisual aids, and demonstrations.

Out-of-class**:** Convert your Zip code or your telephone number into binary number form. Make a chart that shows how the decimal numbers were converted to binary.

Reading and Writing: Describe and sketch the procedures you would use to test a temperature sensor, throttle positioner sensor, and speed sensor for proper operation.

Course Grading Based on Course Objectives

Grading Criteria:

1. Grading system:
•A=90%-100% of points= Excellent
•B=80%-89% of points= Good
•C*=70%-79% of points= Satisfactory
•D= 60%-69% of points= Pass, less than satisfactory
•F= Less than 60% of points= Failing
2. Very important:
•Mid-Term (60 points) will be given on April 5. It will be a multiple-choice test Bring your Scantron, and pencil.
•Final-Exam (60 points) will be given on June 5. It will be a multiple-choice test Bring your Scantron and pencil.
•There are no make-up exams unless you have a very good reason and make arrangements with the instructor before the exam.
•Final grades can be raised or lowered based on your preparation and participation in class. It benefits you to be engage and participative.

Grades:

	Points
Book worksheets, quizzes.	140
Lab activity, hands-on worksheets.	240
Mid-term	60
Final-exam	60
Total points	500

Course Grade:
The course grade is based on total points accumulated during the semester. There is a total of 500 points available. Grades are determined by dividing the total points you earn by the total points available to get your percentage. (Total points may vary if I change the assignments in a particular week). **Grading of Hands-on Assignments:**
The most common problem students experience is not being detailed enough in their answers and not spending the right amount of time in the repair procedures. Always be as specific as you can and use examples from your readings. Make sure to answer all parts of the questions. Points will be deducted for inadequate responses. Feedback will be given after each assignment and, hopefully, you will improve as you proceed with the course. The following grading rubric is used when grading assignments.

	Grading Rubric for Hands-on Assignment	Points
A	Focused and clearly organized. Contains critical thinking and content analysis. Convincing evidence is provided to support conclusions. Ideas are clearly communicated. Clearly meets or exceeds assignments requirements.	18-20
B	Generally focused and contain some development of ideas, may be simplistic or repetitive. Evidence is provided which supports conclusions. Meet assignments requirements.	16-17
C	May be somewhat unfocused, underdeveloped, or rumbling. But does have some coherence. Some evidence is provided which support conclusions. Meets minimum assignment requirements.	14-15
D	Unfocused, underdeveloped. Minimal evidence is used to support conclusion. Does not respond appropriately to the assignment.	12-13
F	Minimal effort by the student. Unfocused, underdeveloped. Evidence is not used to support conclusion. Block overall understanding. Does not meet assignment requirements.	0-11

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Course Policies

- 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.

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.

Automotive Technology Classroom & Shop Policy

- 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.

  Shop/ Lab Area

  - Safety test must be passed to work in the shop and complete required lab exercise.
  - Safety glasses are required to be worn at all times while in the shop area, safety glasses are the student responsibility (students not wearing safety glasses will be ask to leave the class for that day no exceptions).
  - Clean up your area and any other lose debris or trash.
  - Wear all required safety protection and comply with posted signs.
  - No shorts or open toe foot wear, always be prepared to go into the lab area.

- Comply with tool check out policy and return tools clean.
- Do not perform any work on any vehicle outside the assigned task without permission from your instructor.
- Long hair must be kept in a ponytail or tucked away for safety.

Faculty and Staff:

All students are required to take direction from any faculty, any issues with direction should be brought up to your instructor, however all staff has the right to direct any student at any time. Please respect the staff's decisions.

Safety Requirements:

For every task perform in this course the following safety requirements must be strictly enforced: Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

Parking:

No student parking by the building, the only exception is on lab time if your vehicle is a project (instructor approved). Speed limit must be kept at or under 5MPH.
Parking permit is required at all times.

Projects:

All projects are to be taken with the student's unless otherwise approve by the instructor.
All approve projects must be removed from campus prior to finals.
All projects must have a written work order (R/O).

Shop Maintenance:

All work will cease 20 minutes prior to end of class.
All work areas must be cleaned.
Tools must be cleaned and returned to the tool room.
Any broken or missing tools must be reported immediately. Tools are student's responsibility.

Other Course Information

Career possibilities in automotive industry;

Work-based learning (WBL) allows students to apply classroom content in professional settings while gaining real-world experiences. These opportunities will provide you with a deeper, more engaging and relevant learning environment. This semester, you will be working on workplace simulations through the entire course. Some examples of WBL assignments are job shadowing, informational interviews, and guest speakers.

Contact:
Office Phone: (760) 355-5721
Email: careerservicescenter@imperial.edu

Hours of Operation:
Monday - Friday; 8:00 a.m. to 5:00 pm

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IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit http://www.imperial.edu/studentresources or click the heart icon in Canvas.

Anticipated Class Schedule/Calendar

Date or Week	Activity, Assignment, and/or Topic	Pages/ Due Dates/Tests
Week 1 Feb 13-16	Syllabus & Introduction Ford Online Training Chapter 5 Shop Safety	 Pages 55-66
Week 2 Feb 21-24	Chapter 17 Electrical Principals Lab: Use of Multimeter	 Pages 193-202
Week 3 Feb 27-March 3	Chapter 18 Circuit Types and Ohms Law Lab: Use Multimeter to Calculate Ohms Law	 Pages 203-210
Week 4 March 6-10	Chapter 19 Electric & Electronic Components Lab: Inspect and Test Relays, Fuses and Components.	
Week 5 March 13-17	Chapter 21 Wiring Diagrams Lab: Use Wiring Diagrams, Wiring Repair.	Pages 237-261
Week 6-7 March 20-31	Sensor Operation Lab: Electronic Snap Circuits	Basic Electrical Auto Program
Week 8 April 3-7	Mid-Term	Test
April 10-14	Spring Recess	
Week 9 April 17-21 Week 10 April 24-28	Chapter 23 Computer System Fundamentals Lab: Input, Processing, and Outputs Chapter 24 OBD Diagnostics and Scan Tools Lab: Use Scan Tools	Pages 279-294 Pages 294-307
Week 11 May 1-5	Chapter 25 Computer System Service Lab: Inspect and Diagnose Sensors & Outputs	Pages 308-322
Week 12 May 8-12	Chapter 31 12V & HV Starting System Diagnosis and Repair Lab: Test, Inspect, and Diagnose Starting Systems	Pages 400-411
Week 13 May 15-19	Chapter 33 Charging Systems Diagnosis and Repair Lab. Test, Inspect and Diagnose Charging Systems	Pages 422-432
Week 14 May 22-26	Chapter 36: Lights, Instrumentation, Wipers and Horns Operation and Service. Lab: Test body computer control and instrumentation.	Pages 460-484
Week 15 May 30-June2	Chapter 37: Sound Systems and Power Accessories. Lab: Diagnose, Test, replace sound systems and accessories	Pages 485-503
Week 16 June 5-9	FINAL-EXAM	TEST

*****Subject to change without prior notice*****