

Basic Course Information

Semester:	Spring 2021	Instructor Name:	Julio Hernandez
Course Title & #:	AUT 170 – Engine Diagnosis and Repair	Email:	julio.hernandez@imperial.edu
CRN #:	20856	Webpage (optional):	N/A
Classroom:	BLDG 1100	Office #:	1100 bldg.
Class Dates:	ONLINE: 2/16/21 – 4/1/21 IN PERSON: 4/13/21 – 6/10/21	Office Hours:	N/A
Class Days:	T & TR	Office Phone #:	(760) 355-6403
Class Times:	Lecture: 6:00-8:05 PM Lab: 6:00-9:10 PM	Emergency Contact:	(760) 355-6162
Units:	3.00	Class Format:	Hybrid

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 of injection systems. This class emphasizes diagnostic procedures and techniques using basic and sophisticated test equipment. (CSU) (CSU)

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

N/A

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. Research applicable vehicle and service information such as engine management system operation, vehicle service history, service precautions, and service technical bulletins. (ILO1, ILO2, ILO3)
2. Locate and interpret vehicle and major component identification numbers. (ILO1, ILO2, ILO3)
3. Check for module communication (including CAN/BUS systems) errors using a scan tool. (ILO1, ILO2, ILO3)

Course Objectives

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

1. Learn about the automotive computer and its functions in relationship t electronic fuel injection. The student will learn how the computer takes in information processes and reacts to inputs. The student will study open and close loop theory and how it controls the fuel system.
2. Learn about sensors and actuators that control the engine operation. The student will learn how sensors send information to the computer to control fuel systems and engine timing. They will also learn proper test procedures for each compound.

3. Learn throttle body, port fuel injection, mechanical and electronic fuel injection. The student will learn to recognize the difference between the systems; how they operated and how to diagnose each system.
4. Learn about turbo changer and supercharger systems and understand the components of each and how each system works. They will also learn how to make some basic diagnosis on these systems.
5. Student theory and operation of crankcase ventilation, air injection systems and catalytic converters and related components. They will learn how to properly diagnose and repair each system with use of four and five gas analyzer.
6. Learn theory and operation of electronic spark timing and why it is important to electronic fuel injection. The student will learn how to check timing and adjust or repair were it is applicable.
7. Learn what exhaust gas recirculation problems and the proper procedure for repair with the use of four and five analyzer.

Textbooks & Other Resources or Links

Modern Automotive Technology by James E. Duffy ISBN: 978-1-63563-424-2 or Canvas Common Cartridge Access Key Code

Course Requirements and Instructional Methods

Method of Instruction: 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.

Reading and Writing: Reading articles from magazines, book chapters, answering questions, and/or writing short essays when directed.

What if I need to borrow technology or access to WIFI?

1. To request a loaner laptop, MYFI device, or other electronic device, please submit your request here: <https://imperial.edu/students/student-equity-and-achievement/>
2. If you'd like access the WIFI at the IVC campus, you can park in parking lots "I & J". Students must log into the IVC student WIFI by using their IVC email and password. The parking lots will be open Monday through Friday from 8:00 a.m. to 7:00 p.m.

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 will be given on April 15.
 - Final-Exam will be given on June 10.
 - 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 engaged and participate.

Grades:

Quizzes + HW	25%
Shop/Lab Assignments	25%
Midterm Exam	25%
Final Exam	25%
Total	100%

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.
- 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 (!!!!)].

What does it mean to "attend" an online class?

Attendance is critical to student success and for IVC to use federal aid funds. Acceptable indications of attendance are:

- Student submission of an academic assignment
- Student submission of an exam
- Student participation in an instructor-led Zoom conference
- Documented student interaction with class postings, such as an interactive tutorial or computer-assisted instruction via modules
- A posting by the student showing the student's participation in an assignment created by the instructor
- A posting by the student in a discussion forum showing the student's participation in an online discussion about academic matters

- An email from the student or other documentation showing that the student has initiated contact with a faculty member to ask a question about an academic subject studied in the course. Logging onto Canvas alone is NOT adequate to demonstrate academic attendance by the student.

Other Course Information

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.

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.

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



IMPERIAL VALLEY COLLEGE

Date or Week	Activity, Assignment, and/or Topic	Chapters/Tests
Week 1 Feb. 16 & 18	Syllabus, Introduction, Shop Safety	Ch. 5
Week 2 Feb. 23 & 25	Engine Fundamentals + Engine Design Classifications	Ch. 11, Ch. 12
Week 3 March 2 & 4	Electrical Tools + Test Equipment + Wiring Diagrams	Ch. 20, Ch. 21
Week 4 March 9 & 11	Ignition System Technology + Ignition System Test & Repair	Ch. 34, Ch. 35
Week 5 March 16 & 18	Gas Fuel Injection Systems + Gas F.I. Systems Diagnosis & Repair	Ch. 41, Ch. 42
Week 6 March 23 & 25	Emissions Control Systems + Diagnosis/ Repair	Ch. 51, Ch. 52
Week 7 March 30 & April 1	Turbo Chargers + Super Chargers	Ch. 46
Week 8 April 5 & 10	Spring Break -NO CLASSES-	
Week 9 April 13 & 15	4/13: Midterm Exam 4/15: Labs start today. First Lab – Check Electronic Ignition System Performance + Diagnosis	Midterm Lab
Week 10 April 20 & 22	Check Performance of a Fuel Injection System (Pump Injectors...)	Lab
Week 11 April 27 & 29	Use Scan Tool to Diagnose Electric Fuel System Components	Lab
Week 12 May 4 & 6	Repair/Replace Fuel System Components	Lab
Week 13 May 11 & 13	Analyze Turbo and Super Charger Systems + Check Performance	Lab
Week 14 May 18 & 20	Test PCV System Operation / Repair as Needed	Lab
Week 15 May 25 & 27	Check and Repair Electronic Ignition System Components	Lab
Week 16 June 1 & 3	Test Operation of EGR Systems	Lab
Week 17 June 8 & 10	6/8: Final Exam Review 6/10: Final Exam	

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