



Basic Course Information

Semester:	SPRING 2021	Instructor Name:	Ricardo Pradis
Course Title & #:	EMISSIONS CONTROL & COMPUTER SYSTEMS AUT-230	Email:	ricardo.pradis@imperial.edu
CRN #:	20849	Webpage (optional):	
Classroom:	BLDG 1100	Office #:	1100 bldg.
Class Dates:	FEB. 16 – JUN 11 2021	Office Hours:	
Class Days:	M 8:00-11:10 AM W 8:00-10:05 AM	Office Phone #:	760-355-6403
Class Times:	FEB. 16 TO APRIL 2 CANVAS APRIL 12 TO JUNE 11 LAB	Emergency Contact:	760-355-6403
Units:	3.0	Class Format:	Hybrid

Course Description

This is an advanced engine computer and drivability course. It emphasizes diagnostic procedure and techniques using all types of equipment and procedures. This class brings together all knowledge from AUT 160, and AUT170, and allows the students to diagnose all systems of the automobile. Upon successful completion of this course students are prepared to take the Automotive Service Excellence (ASE) certification examination in electronics, engine performance, and advance engine performance.

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

None

Student Learning Outcomes

1. Diagnose the causes of emissions or driveability concerns with store or active diagnostic trouble codes; obtain graph, and interpret scan tool data.
2. Access and use service information to perform step-by-step diagnosis.
3. Inspect and test ignition primary and secondary circuit wiring and solid state components; perform necessary action.

Course Objectives

1. Learn the proper safety practices of tools and equipment; learn hazardous waste policies and procedures, and learn about the air bag systems.
2. Learn about equipment used to obtain proper repair procedures using a service bulletins, computer system manuals, as well as the proper tools for each diagnosis.
3. Learn about the meters used for testing electrical circuits; learn the proper procedure for testing batteries, starters, alternators, voltage drops, and electrical drains.
4. Learn and diagnose problems with engines such as oil leaks, engine noises, overheating, compression, and vacuum problems; will also learn the proper diagnostic procedure along with the use of the proper equipment and tools.

5. Learn how to diagnose the ‘no-start condition’ caused by ignition systems; test and replace different components of an ignition system in the primary and secondary circuits with the aid of diagnostic equipment.
6. Learn to diagnose fuel problems that cause the ‘no start condition’ and drivability; will also learn the procedure for testing components for fuel systems.
7. Learn the proper methods of testing for problems in intake and exhaust systems; will learn to use a vacuum gauge, back pressure gauge, four gas analyzer, and be able to take temperature readings for the system.
8. Learn how to use four and five gas analyzers to perform emission control diagnosis; will learn how to diagnose different component in an emission system along with the use of different types of diagnostic equipment.
9. Learn how to pull up engine codes and perform scan tool operation using an engine computer, will also learn how to test engine control sensors.
10. Learn to perform a fuel pressure test, clean and replace injectors, diagnose idle problems, and learn how to perform a leakage test on a fuel injection system.
11. Learn to perform the necessary test to repair electronic carburetor controls.
12. Learn how to diagnose the ‘no-start condition’ on distributor type ignition systems; learn to replace a distributor, set and check timing, and describe how the timing affects the vehicle operation.
13. Learn how to diagnose the ‘no-start condition’ on electronic-equipped engines; learn how to replace and adjust cam and crank sensors.
14. Learn how an OBD II System works; learn how to diagnose the system using a scan tool, and learn the associated terminology of an OBD II System

Textbooks & Other Resources or Links

Textbook: Modern Automotive Technology 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.

Out of class:

Obtain information from a flat rate manual and a parts catalog and prepare a repair order for replacement and diagnosis of a fuel pump, starter, and a battery on a vehicle of your choice. Check the information for the amount of labor involved. Then, consult the parts catalog for the cost of the part. Add up the cost plus state tax (figure labor cost at \$58/hour)

Reading and Writing:

Using sketches and principles you have learned about basic electricity, prepare a presentation showing how electricity can be created through magnetism.

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.

Guidelines for using parking WIFI:

- Park in every other space (empty space BETWEEN vehicles)
- Must have facemask available
- For best reception park near buildings
- Only park at marked student spaces
- Only owners of a valid disabled placard may use disabled parking spaces
- Only members of the same household in each vehicle
- Occupants **MUST** remain in vehicles
- Restrooms and other on-campus services not available
- College campus safety will monitor the parking lot
- Student code of conduct and all other parking guidelines are in effect
- Please do not leave any trash behind
- No parking permit required** If you have any questions about using parking WIFI, please call Student Affairs at 760- 355-6455

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 the week of April 12.
- **Final-Exam** will be given on the week of June 7.
- 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

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

Date or Week	Activity, Assignment, and/or Topic	Pages/ Due Dates/Tests
Week 1 Feb. 61-19	Syllabus & Introduction Chapter 5 Auto Shop Safety	Pages 75-84
Week 2 Feb. 22-26	Chapter 10 Career Success	Pages 157-164
Week 3 March 1-5	Chapter 21 Wiring Diagrams and Wiring Repairs	Pages 311-337
Week 4 March 8-12	Chapter 23 Computer System Fundamentals	Pages 373-392
Week 5 March 15-19	Chapter 34 Ignition System Technology	Pages 565-575
Week 6 March 22-26	Chapter 41 Gasoline Injection Fundamentals	Pages 721-738
Week 7 March 29-April 2	Chapter 51 Emission Control System Technology	Pages 931-954
Week 8 April 12-16	Mid-Term & Chapter 9 Vehicle Maintenance, Fluid Service and Recycling. Lab: Vehicle Maintenance, Fluid Service, Service Intervals, General Inspection, Recycling and Disposal.	Pages 137-152 Lab. Exercise
Week 9 April 19-23	Chapter 24 On-Board Diagnostics Lab: Scanning Computer Problems, Data Stream Values, Erasing Trouble Codes.	Pages 399-410 Lab. Exercise
Week 10-11 April 26-30 May 3-7	Chapter 34 Ignition System Testing & Repair Lab: Scanning Ignition System Problems, Spark Plugs, Ignition Timing, Coil Pack, Ignition Switch, Control Module, and Ignition System Sensors Service.	Pages 581-596 Lab. Exercise
Week 12-13 May 10-14 May 17-21	Chapter 42 Gasoline Injection Diagnosis & Repair Lab: Fuel System Test, Fuel Injector Problems. Service and Replace Multiport, Direct, and Electronic Fuel Injectors. Fuel System Sensor service.	Pages 743-768 Lab. Exercise
Week 14-15 May 24-28 June 1-4	Chapter 52 Emission Control System Testing Service & Repair Lab: Computer Control Emission system Service, Reset Emission Maintenance Reminders, Use Exhaust Gas Analyzer, State Emissions Testing Programs, Emission Components Testing, Perform a OBD II Drive Cycle.	Pages 957-980 Lab. Exercise



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Date or Week	Activity, Assignment, and/or Topic	Pages/ Due Dates/Tests
Week 16 June 7-11	FINAL-EXAM	

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