



## Basic Course Information

Semester:	<b>Fall 2024</b>	Instructor Name:	<b>Andres Estrada</b>
Course Title & #:	<b>Engine Performance Tune-Up AUT 160</b>	Email:	<b>andres.estrada@imperial.edu</b>
CRN #:	<b>10393</b>	Webpage (optional):	
Classroom:	<b>CUHS Auto Shop</b>	Office #:	<b>CUHS Auto Shop</b>
Class Dates:	<b>Aug 12th – Dec 7th</b>	Office Hours:	<b>Mon-Thu 11:30am-12pm 3:00pm-3:30pm</b>
Class Days:	<b>Monday / Wednesday</b>	Office Phone #:	
Class Times:	<b>3:45pm – 6:15pm</b>	Emergency Contact:	<b>Tisha Nelson: 760-355-6361</b>
Units:	<b>3.0</b>	Class Format/Modality:	<b>Face to Face</b>

## Course Description

This course provides Operating Theory and hands-on experience in the Operation, Diagnosis and Repair of Automotive Fuel Systems with Carburetors, basic Throttle Body and Port Fuel Injection systems. Students will learn to use the Four-gas Analyzer, Engine Performance tests and Introduction to Computer Theory.

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

None.

## Student Learning Outcomes

1. Identify and interpret engine performance concern; determine necessary action.
2. Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze and frame data; clear codes when applicable.
3. Diagnose emissions or drivability concerns without stored diagnostic trouble codes; determined necessary action.

## Course Objectives

1. Study and perform proper shop safety practices and learn proper handling of hazardous waste.
2. Study and learn which emissions are produced by the automobile. Learn which gases are harmful to the atmosphere and themselves. Learn how studying emissions is useful for diagnosing vehicles in proper operating conditions.
3. Study engine strokes to better understand which strokes create compression and which create vacuum. Perform vacuum and compression tests and learn how to analyze the readings obtained. Learn how to calculate compression ratios based off different engine designs and component variations.
4. Study and learn the necessity for automobiles to have the correct air-fuel ratio. Study what may happen if the ratio is incorrect.
5. Study how fuel is stored and how it is moved from the fuel tank through the fuel system. Learn about evaporative emission systems and how to test this system. Learn what can happen when the evaporative emissions system does not work correctly.



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6. Study different types of fuel pumps and filtering systems. Learn how to diagnose pumps and filters to determine the necessary actions to correct any fuel system concern.
7. Study the theory and operation of the intake and exhaust systems. Learn proper diagnostic procedures for both systems and how to interpret the data to correct any concerns from either system.
8. Learn theory and operation differences between port injection and direct fuel injection systems. Study how each system operates and be able to understand the data retrieved from the vehicles computer.

### Textbooks & Other Resources or Links

Textbook: G-W Modern Automotive Technology 10th Edition ISBN: 978-1-64564-688-4

Access to a computer and internet.

Pens, pencils, and paper.

### Course Requirements and Instructional Methods

This course will consist of a variety of instructional methods and assignments including, but not limited to, lectures, class discussions, group activities, a research paper, interviews, and hands-on shop activities.

### Course Grading Based on Course Objectives

Grading System:

A - 360-400 of points = Excellent

B - 320-359 of points = Good

C - 280-319 of points = Acceptable

D - 240-279 of points = Below Average

F – Below 240 = Failing

Activities	Points
Homework, Classwork Activities, Lab	280
Mid-Term Exam	Written 40; Hands on 20
Final Exam	Written 40; Hands on 20
Total Points	400

\*\*\*There are no make-up exams unless arrangements with the instructor are made prior to exam.

\*\*\*Points total may differ from what is outlined above.

### Academic Honesty (Artificial Intelligence -AI)

IVC values critical thinking and communication skills and considers academic integrity essential to learning. Using AI tools as a replacement for your own thinking, writing, or quantitative reasoning goes against both our mission and academic honesty policy and will be considered academic dishonesty, or plagiarism unless you have been instructed to do so by your instructor. In case of any uncertainty regarding the ethical use of AI tools, students are encouraged to reach out to their instructors for clarification.



## Course Policies

- **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:** 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, only students enrolled in the class may attend; children are not allowed.

**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.

## Other Course Information

### Shop/Lab Area Safety

- Safety test must be passed to work in the shop and complete required lab exercise.
- Safety glasses are to be worn at all times while in the shop area, safety glasses are the student's responsibility (students not wearing safety glasses will be asked to leave lab for that day, no exceptions).
- Clean up your area and any other loose debris, trash, or spills.
- Wear all required safety protection and comply with posted signs.
- No shorts or open toe footwear, always be prepared for lab exercises.
- Comply with tool check out policy and clean tools before returning.
- Damaged or missing tools must be reported immediately. Tools are the students' responsibility.
- 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.
- Jewelry such as rings and necklaces must be put away or tucked in for safety.
- Lab work will cease 20 minutes prior to the end of class to allow time for cleaning areas and returning tools.



## Projects

- All projects must be approved by the instructor and require a written work order.
- All projects must be removed from campus prior to finals.
- Projects are taken with students at the end of class unless approved by the instructor.
- All work will cease 20 minutes prior to the 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 the student's responsibility.

In addition to the standard course curriculum, portions of this course will prepare you for ASE certifications.

## 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	Syllabus & Introduction Chapter 5 Auto Shop Safety	Pages 55-65 Safety Test
Week 2	Chapter 11 Engine Fundamentals  Lab: Locate & interpret engine and major components and identification numbers (VIN, vehicle identification levels, and calibration decals), engine components.	Pages 129-143
Week 3	Chapter 55 Engine Mechanical Problems  Lab: Perform engine absolute manifold pressure test (vacuum), perform power balance test. Perform cylinder compression test.	Pages 775-798 Chapter 11 Homework due
Week 4	Chapter 47 Cooling System Technology. Lab: Identify cooling systems components	Pages 639-655 Chapter 55 Homework due
Week 5	Chapter 48 Cooling System Testing, Maintenance and Repair. Lab: Cooling system service.	Pages 656-677 Chapter 47 Homework due
Week 6	Chapter 49 Lubrication System Fundamentals. Lab: Identify lubrication systems components.	Pages 678-692 Chapter 48 Homework due
Week 7	Chapter 50 Lubrication System Diagnosis, Testing, and Repair. Lab: perform lube, oil, and filter change, point's inspections.	Chapter 49 Homework due
Week 8	<b>Mid-Term Exams</b>	Chapter 50 Homework due
Week 9	Chapter 19 Electric and Electronic Components.	Pages 211-227



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<b>Date or Week</b>	<b>Activity, Assignment, and/or Topic</b>	<b>Pages/ Due Dates/Tests</b>
	Lab: Identify and test electrical components.	
Week 10	Chapter 24 On-board Diagnostics and Scan-Tools. Lab: Use scan-tool to diagnose computer systems	Pages 295-307 Chapter 19 Homework due
Week 11	Chapter 31 Starting System Diagnosis, Testing, & Repair. Lab: Diagnose and repair a starting system.	Pages 400-411 Chapter 24 Homework due
Week 12	Chapter 33 Charging system diagnosis and repair Lab: Test 12 Volt Charging System with a Voltmeter, Load Tester, and Scan Tool	Pages 422-432 Chapter 31 Homework due
Week 13	Chapter 39 Automotive Fuels and Combustion Efficiency	Pages 517-528 Chapter 33 Homework due
Week 14	Chapter 40 Fuel Tanks, Pumps	Pages 529-548 Chapter 39 Homework due
Week 15	Chapter 41 Gasoline Injection Fundamentals. Lab: Fuel system service and component identification.	Pages 549-566 Chapter 40 Homework due
Week 16	<b>FINAL EXAMS</b>	Chapter 41 Homework due

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