



## Basic Course Information

Semester:	<b>Winter 2025</b>	Instructor Name:	<b>Ricardo Pradis</b>
Course Title & #:	<b>Engine Performance Tune-up AUT-160</b>	Email:	<b>ricardo.pradis@imperial.edu</b>
CRN #:	<b>15274</b>	Webpage (optional):	
Classroom:	<b>BLDG 1100</b>	Office #:	<b>1100 bldg.</b>
Class Dates:	<b>Jan 2-Feb 3</b>	Office Hours:	<b>2:30-3:00 am – M - F</b>
Class Days:	<b>Monday - Friday</b>	Office Phone #:	<b>760-355-6403</b>
Class Times:	<b>3:00 – 4:20 pm 4:30 – 6:40 pm</b>	Emergency Contact:	<b>760-355-6361 (Secretary)</b>
Units:	<b>3.0</b>	Class Format:	<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; determined 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 driveability concerns without store diagnostic trouble codes; determined necessary action.

## Course Objectives

1. Study and perform proper shop safety practice and learn proper handling of hazardous waste.
2. Study and learn all of the emissions that are produced by the automobile, they will learn which are harmful to the atmosphere. The student will learn which emission are useful in diagnosing the vehicles for proper operation. The student will study 4 and 5 gas analyzers.
3. Learn the different strokes of the engine and compression and vacuum theory. The student will perform vacuum and compressions test and learn how too much proper diagnosis from the readings they obtain. The student will learn how to figure engine size, compression ratio, and different engine designs.
4. Study and learn why automobile need a proper amount of air and fuel. They will also learn what happens if this ratio is not correct.
5. Study how fuel is stored and how it is moved from fuel tank to carburetion or injection system. Student will learn about Evaporative controls systems and how to test these

systems and what happens if this ratio is not correct.

6. Study different types of fuel pumps and filtering systems. They will also study how to diagnose these pumps and filters and learn the necessary action to correct any problems found.

7. Learn how air filter systems work and how thermostatically controlled air systems work. The student will learn how to diagnose the systems and proper procedure for repairing each system.

8. Study the theory and operation of intake and exhaust systems including catalytic converters. The student will learn proper diagnostic procedure for both systems and how to interpret the result from the diagnostic equipment.

9. Learn theory and operation of Mechanical and Electronic carburetor. They will learn to overhaul procedures & troubleshooting procedure with 4 and 5 analyzers.

10. Study theory of fuel injection. The student will study sensors and actuators and how to be diagnosing of each. The student will study both mechanical and electronic fuel

### Textbooks & Other Resources or Links

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

### 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:

Using an automotive tool catalog, develop a list of power tools needed to equip an automotive repair shop. Find prices and add up the cost.

#### Reading and Writing:

Research safety literature on power equipment used in an automotive repair facility.

- a) Develop a bibliography of resources for safe use of power equipment.
- b) Develop a list of safety rules for their use.

### 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 Jan 17.
- **Final-Exam** will be given on Feb 3.
- There are no make-up exams unless you have a very good reason and plan 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 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 rambling. 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.

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.

- 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.

## Other Course Information

### Automotive Technology Classroom & Shop Policy

#### 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 loose 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, no loud music.

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**

<b>Date or Week</b>	<b>Activity, Assignment, and/or Topic</b>	<b>Pages/ Due Dates/Tests</b>
Week 1	Syllabus & Introduction, Ford Service Training Chapter 5 Auto Shop Safety	Pages 55-66
Week 1	Chapter 1 The Automobile Lab: Identify assemblies and major automotive systems.	Pages 3-19
Week 2	Chapter 11 Engine Fundamentals (engine operation) Lab: Locate & interpret engine and vehicle major components and identification numbers (VIN, vehicle identification levels, and calibration decals), engine components.	Pages 129-143
Week 2	Chapter 55 Engine Mechanical Problems.	Pages 775-798

<b>Date or Week</b>	<b>Activity, Assignment, and/or Topic</b>	<b>Pages/ Due Dates/Tests</b>
	Lab: Perform engine absolute manifold pressure test (vacuum), perform power balance test. Perform cylinder compression test.	
Week 2	Chapter 47 Cooling System Technology. Lab: Identify cooling systems components	Pages 639-655
Week 2	Chapter 48 Cooling System Testing, Maintenance and Repair. Lab: Cooling system service.	Pages 656-677
Week 3	Chapter 49 Lubrication System Fundamentals. Lab: Identify lubrication systems components.	Pages 678-692
Week 3	Chapter 50 Lubrication System Diagnosis, Testing, and Repair. Lab: perform lube, oil, and filter change, point's inspections.	Pages 693-706
Week 3	Mid-Term	Exam
Week 4	Chapter 19 Electric and Electronic Components. Lab: Identify and test electrical components.	Pages 211-227
Week 4	Chapter 31 Starting System Diagnosis, Testing, & Repair. Lab: Diagnose and repair a starting system.	Pages 400-411
Week 4	Chapter 33 Charging system diagnosis and repair Lab: Test 12 Volt Charging System with a Voltmeter, Load Tester, and Scan Tool.	Pages 422-432
Week 4	Chapter 24 On-board Diagnostics and Scan-Tools. Lab: Use scan-tool to diagnose computer systems	Pages 295-307
Week 5	Chapter 41 Gasoline Injection Fundamentals. Lab: Fuel system service and component identification.	Pages 549-566
Week 5	Chapter 34 Ignition System Technology. Lab: Ignition system service.	Pages 433-445
Week 5	FINAL-EXAM	EXAM



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

## **Work-based Learning**

Career possibilities in the automotive industry:

Work-based learning (WBL) allows student to apply classroom content in professional settings while gaining real-work experiences. These opportunities will provide you with a deeper, more engaging and relevant learning environment. Some examples of WBL assignments are job shadowing, informational interviews, and guest speakers. In this course, you will be working on workplace simulations and will be using Ford Service Training online program. It is intended to provide students with simple knowledge (basic) to complex skills (advance) training.

### **Contact:**

Office Phone: (760) 355-5721

Email: [careerservicescenter@imperial.edu](mailto:careerservicescenter@imperial.edu)

### **Hours of Operation:**

Monday - Friday; 8:00 a.m. to 5:00 p.m.