

**Imperial Valley College
Industrial Technology Division
Automotive Department**

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| Course Title: | AUT-160 Engine Performance Tune-Up |
| Semester: | Spring 2013 |
| Class Schedule: | Monday 6:30 – 8:30 pm Wednesday 6:30 – 9:50 pm |
| Location: | Room 1100 lecture Room 1102 laboratory |
| Instructor: | Ricardo Pradis |
| Phone: | (760) 355-6403 |
| Email: | <u>ricardo.pradis@imperial.edu</u> |
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| Coordinator: | Jose Lopez (760) 355-6261 |
| Secretary/Division | Frances Gomez (760) 355-6361 |

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.

Institutional Student Learning Outcomes (ISLO)

Student learning outcomes are written statements that represent faculty and departmental learning goals for students. After successful completion of the program or degree at Imperial Valley College, students are expected to have measurable improvement in the following areas:

- ISLO 1: Communication Skills
- ISLO 2: Critical Thinking Skills
- ISLO 3: Personal Responsibility
- ISLO 4: Information Literacy
- ISLO 5: Global Awareness

AUT-160 Engine Performance Tune-Up will provide students with learning opportunities to improve in five of the Institutional Learning Outcomes: Communication Skills (SLO1), Critical Thinking (SLO2), Personal Responsibility (SLO3), Information Literacy (SLO4), and Global Awareness (SLO5).

Course Objectives- Upon successful completion of this course, the student will:

- Describe the construction and operation of the four-cycle engine
- Explain how mechanical and electrical fuel pumps work
- Describe various intake manifolds designs
- Understand Fuel Composition
- Explain how a lubricating system works
- Describe how the components of the cooling system operate
- Explain the function and operation of various sensors and actuators
- Troubleshoot and service sensors, actuators, and electronic control module
- Explain strategy-based diagnosis
- List various engine Troubles and identify possible causes

Grading Criteria:

1. Attendance: First day of class, regular attendance, and withdrawal after exceeding the number of class hours per week.
2. Tardiness: Three times equals one absent.
3. Student Conduct: Upon entry into IVC constitutes the student's acceptance of the standards of student conduct and the regulations publish by the college.
4. Each student is responsible for making up schoolwork missed because of absences.
5. 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
6. Very important:
 - **Mid-Term** (60 points) will be given on March 4. It will be a multiple choice test **Bring your Scantron, and pencil.**
 - **Final-Exam** (60 points) will be given on May 6. 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 rumbly. 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 |
| C | Minimal effort by the student. Unfocused, underdeveloped. Evidence is not used to support conclusion. Block overall understanding. Does not meet assignment requirements. | 0-11 |

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.

Student Responsibility:

1. Participate in class turn in all your completed assignments to the instructor.
2. Scantron answer sheets and #2 pencils will be used on test days. You may get this from the bookstore.
3. If you are having trouble with the course and/or personal problems, communicate with the instructor as soon as possible so as to get the help needed.

4. If you have any form of disability, please inform the instructor so that you can get the assistance you may need. Please contact DSPS office as soon as possible: 355-6312, 2100 Bldg. I have made every effort to ensure that this course is accessible to all students, including students with disabilities. If you encounter any problem during this course, please contact me immediately.
5. Please, no food, smoking, or visitors during class.
6. Anyone using a cell phone/pager or other communication device, or carrying a device that makes noise, during class will be ask to leave and will receive only partial points.
7. Students have the right to experience a positive learning environment; students who disrupt that environment can be asked to leave the class. Please refer to catalog for more information. Swearing, negative remarks and discriminatory statements will not be tolerated. If someone says anything to you that makes you feel uncomfortable or that you feel is inappropriate contact your instructor immediately.
8. It is the responsibility of the student to officially withdraw from the course through the Office of Admission and Records, if you stop actively participating in the course, it does not mean I will drop you, but I can drop you at my own discretion. You must officially drop the course yourself before the deadline or you will receive a grade on your official transcript.

Course Instructional Schedule and Learning Activities:

WEEK 1:

Class orientation. Class introduction. Safety orientation, Class activities, using textbook, Homework, and safety test.

For every task in the Engine Performance Tune-up class the following safety requirements must be strictly enforce:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposals of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

WEEK 2 & 3:

- Chapter 11: Engine Fundamentals
- Lab. Activity:
Locate & interpret vehicle and major component identification numbers (VIN, vehicle identification levels, and calibration decals).
- Perform engine absolute manifold pressure test (vacuum).
- Perform power balance test.
- Perform cylinder compression test.

WEEK 4 & 5:

- Chapter 21: Fuel Tanks, Pumps, Lines, and Filters
- Lab. Activity:
 - Test Mechanical Fuel Pumps
 - Test Electrical Fuel pumps
 - Change Fuel Filters
 - Service Air Cleaners

WEEK 6:

- Chapter 20: Automotive Fuels
- Lab. Activity:
- Prepare 4 or 5 gas analyzer, inspect and prepared vehicle for test, and obtain exhaust readings; interpret readings and determined necessary action.

WEEK 7:

- Chapter 41-42: Engine Lubrication
- Lab. Activity:
- Perform oil, filter change and a 27 point inspection.

WEEK 8:

- **MID-TERM**

WEEK 9:

- Chapter 39-40: Cooling System
- Lab. Activity:
- Verify engine operating temperature.
- Perform cooling system test; check coolant condition; inspect and test radiator pressure cap, coolant recovery tank and hoses.

WEEK 10:

- Chapter 17-18: Computer System Fundamentals
- Lab. Activity:
- Retrieve and record stored OBD 1 diagnostic trouble codes, clear codes.
- Retrieve and record stored OBD 11 diagnostic trouble codes, clear codes.

WEEK 11:

- Chapter 47: Engine Tune-Up
- Lab Activity:
- Fill out a repair order
- Maintenance check

WEEK 12 & 13:

- Chapter 29-31-33: Electrical Systems
- Lab. Activity:
- Inspect and test battery
- Inspect and test charging system.
- Inspect and test starting system.

WEEK 14:

- Chapter 35: Ignition System Fundamentals
- Lab. Activity:
- Inspect and test ignition primary system wiring and components.
- Inspect and test ignition secondary system wiring and components.

WEEK 15:

- Preparation for Final Exam

WEEK 16:

- **FINAL-EXAM**

Equipment and Supplies:

1. Textbook & Workbook: Modern Automotive Technology 7th Edition James E. Duffy
2. Pen and pencils.
3. Standard writing paper.
4. Personal Protective Equipment:
 - Safety glasses,
 - Work footwear,
 - Proper shirt and pants.

Safety Requirements:

For every task performed in the Engine tune up course the following safety requirements must be strictly enforce:

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.

Instructor Office Hours:

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| Monday: | 10:30 – 11:30 am |
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| Wednesday: | 10:30 – 11:30 am 5:30 – 6:30 pm |
| Friday: | 10:30 – 11:30 am |
| | |
| By Appointment: | Contact me at 760-355-6403 or ricardo.pradis@imperial.edu |

In Case of Emergency:

If you have a life-threatening illness or injury that requires an ambulance, **call 911immediately** Emergency costs are not covered by Student Health Services. The Student Health Fee allows the students to receive health services on campus an at various health centers in the community. For more information refer to the catalog.