

**IMPERIAL VALLEY
COLLEGE
LEARNING FOR SUCCESS**

**AUTOMOTIVE
TECHNOLOGY**

**AUT-210
AUTOMOTIVE AIR-CONDITIONING
COURSE SYLLABUS**

**INSTRUCTOR:
RICARDO PRADIS
FALL 2013**

IMPERIAL VALLEY COLLEGE
Industrial Technology Division
Automotive Department

AUTOMOTIVE AIR-CONDITIONING

AUT-210

Ricardo Pradis- Instructor

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Course Description:

This course is designed to impart knowledge and information needed by the student to enter and make progress in employment service industry. The use of charging station and systems will part of A/C course. Up on completion of this course the student will be prepared to take the Automotive Service Excellence (ASE) examination for air conditioning. On productive basis in the automotive air conditioning.

Class Schedule:

Monday 6:30 – 9:00 pm

Wednesday 6:30 – 8:20 pm

All students are to report to class on time defined as class schedule. Any students who arrive 15 minutes after class start time will be marked absent. You are required to report to the instructor if you will be late or must leave early or you will be mark absent for that day.

Course Objectives-Upon successful completion of this course the student will be able to:

- Describe the fundamentals of air conditioning
- List the major parts of air conditioning system and the purpose of each.
- Summarize the principles of air conditioning.
- Explain why R-134a is being used in the air conditioning systems of late-model vehicles.
- Explain how the heating system works.
- List the different types of air conditioning.
- State the basics of the electron theory of electricity.
- Describe the characteristics of series, parallel, and series-parallel circuits.
- Employ ohm's law in trouble shooting electrical circuits.
- Troubleshoot and air conditioning system.

Automotive Technology Classroom & Shop Policy

Classroom:

No Eating during lectures (coffee or drinks allowed). Respect your fellow student's space and property. Be on time so as to not disturb others during lectures. If you miss a class you are responsible to make up all work. Bring required material to every class session. Computers are to be used only for school related projects or assignments. No cell phones will be used during class, this include "**Texting**" all phones must be set to silent/vibrate and if you must take a call please leave the classroom quietly. No stereo's or music allowed in the classroom or lab area. 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. 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.

Special Needs

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.

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.
- 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.
- Long hair must be kept in a ponytail or tucked away for safety.

Faculty and Staff

All students are required to take direction from any faculty, any issues with direction should be brought up to your instructor, however all staff has the right to direct any student at any time. Please respect the staff's decisions.

Safety Requirements:

For every task perform in the Air Conditioning 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.

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

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.

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.

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 October 9. It will be a multiple choice test **Bring your Scantron, and pencil.**
 - **Final-Exam** (60 points) will be given on December 4. 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 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
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.

Course Instructional Schedule and Learning Activities

Week 1: Class Orientation, safety procedures, demonstrations, shop activities, and safety test.

Week 2: Automotive Air Conditioning History and Certifications
Lab. activity: HVAC system inspection

Week 3: Principles of Air Conditioning
Lab. activity: Install gauge set and check system pressures.

Week 4: Air Conditioning Tools, Equipment, and Measuring Systems
Lab. activity: Test condenser performance.

Week 5: Pressure and Temperature
Lab. activity: Check expansion device operation

Week 6: Refrigerants and Lubricants
Lab. activity: A/C system leak check

Week 7: Air Conditioning Components
Lab. activity: Evacuate and recharge an A/C system.

Week 8: Compressors and Clutches

Lab activity: Bench check an A/C compressor and clutch coil.

Week 9: Mid-Term

Week 10: Automobile Heating Systems.

Lab. activity: Check heater system and test heater core

Week 11: Basic Electricity

Lab. activity: Volt-ohmmeter usage and test A/C clutch circuit.

Week 12: Electrical Circuits

Lab. activity: Test HVAC blower circuit and cooling fan circuit.

Week 13: Meters and Testers

Lab. activity: Recharge an A/C system – manifold gauge set.

Week 14: Air Conditioner Controls

Lab. activity: Test vacuum mode door motor and system.

Week 15: Troubleshooting and Repair

Week 16: Final Exam

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-210 Automotive Air Conditioning 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).

Instructor Office Hours:

Monday:	10:00 am - 11:00 am
Tuesday:	10:25 am – 11:25 am
Wednesday:	10:35 am – 11:35 am
Friday:	10:00 am – 11:00 am
By Appointment:	Contact me at 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 911 immediately. Emergency costs are not covered by Student Health Services.

The Student Health Fee allows the students to receive health services on campus and at various health centers in the community. For more information refer to the IVC web page.

Important Dates:

August 19 classes begin.

August 19-31 late registration

August 31 deadline to register for full-term courses, deadline to drop full-term classes without owing fees and/or be eligible for refund

September 2 deadline to drop without course appearing on transcript (without receiving a W)

September 2 Holiday – Labor Day; no classes

September 3 Ticketing for parking violations begins

November 1 deadline to submit petition for graduation

November 9 deadline to drop full term classes

November 11 Holiday – in Honor of Veterans' Day; no classes

November 28-30 Holiday – Thanksgiving; no classes

December 2-7 last week of classes