

Basic Course Information

Semester:	Winter 2016	Instructor Name:	Ricardo Pradis
Course Title & #:	Automotive Maintenance & Repair AUT-085	Email:	Ricardo.pradis@imperial.edu
Classroom:	1100	Office #:	1100
Class Days:	MTWRF	Office Phone #:	760-355-6403
Class Times:	8:00-9:20 am 9:30-11:45am	Emergency Contact:	760-355-6462
Units:	3		

Course Description

This course is designed for students with little or no previous automotive maintenance training. This course consists of automotive safety, demonstrations of emergency situations, such as, changing a flat tire, replacing burned out lamps, and performing general vehicle maintenance and repairs. In addition, the student will learn the correct and safe way to use basic hand tools. (Nontransferable, nondegree applicable)

Student Learning Outcomes

1. Explain the interaction of automotive systems.
2. Describe the purpose of the fundamental automotive system.
3. Describe the type of skills needed to be an auto technician.

Course Objectives

1. Demonstrate safe job practices.
2. Demonstrate emergency situations and repairs.
3. Demonstrate how to inspect and replace all types of lamps.
4. Demonstrate how to inspect, replace and repair windshield accessories.
5. Demonstrate how to use jumper cables with precaution.
6. Demonstrate how to perform vehicle maintenance and repairs.
7. Demonstrate how to use basic hand tools.

Textbooks & Other Resources or Links

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

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 assignment:

Collect automotive catalogs and create a list of hand tools needed to equip an automotive shop. Provide an estimate of what it will cost to purchase the tools.

Reading and Writing:

Research an automotive career of your choice and prepare a written report covering such topics as duties, working conditions, pay range, and opportunities for advancement.

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 19. It will be a multiple choice test **Bring your Scantron, and pencil.**
 - **Final-Exam** will be given on Feb 5. 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.

Lab activity, hands-on worksheets.	380
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).

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.
- 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 Automotive Electronics 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.

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

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.

Classroom Etiquette

[Required Information: Describe your policies regarding classroom conduct. The below is suggested language and may be modified for your course.]

- 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 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, no one who is not enrolled in the class may attend, including children.

Online Netiquette

- 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 (!!!!)].

Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property. 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.

- **Plagiarism** is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to "cite a source" correctly, you must ask for help.
- **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.

Additional Student Services

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

- **Blackboard Support Site.** The Blackboard Support Site provides a variety of support channels available to students 24 hours per day.
- **Learning Services.** There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your [Campus Map](#) for the [Math Lab](#); [Reading, Writing & Language Labs](#); and the [Study Skills Center](#).
- **Library Services.** There is more to our library than just books. You have access to tutors in the [Study Skills Center](#), study rooms for small groups, and online access to a wealth of resources.

Disabled Student Programs and Services (DSPS)

Any student with a documented disability who may need educational accommodations should notify the instructor or the [Disabled Student Programs and Services](#) (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313. Please contact them if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee.

- [Student Health Center](#). A Student Health Nurse is available on campus. In addition, Pioneers Memorial Healthcare District and El Centro Regional Center provide basic health services for students, such as first aid and care for minor illnesses. Contact the IVC [Student Health Center](#) at 760-355-6310 in Room 2109 for more information.
- [Mental Health Counseling Services](#). Short-term individual, couples, family, and group therapy are provided to currently enrolled students. Contact the IVC [Mental Health Counseling Services](#) at 760-355-6196 in Room 2109 for more information.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC [General Catalog](#).

Information Literacy

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC [Library Department](#) provides numerous [Information Literacy Tutorials](#) to assist students in this endeavor.

Anticipated Class Schedule/Calendar

[Required Information – Discretionary Language and Formatting: The instructor will provide a tentative, provisional overview of the readings, assignments, tests, and/or other activities for the duration of the course. A table format may be useful for this purpose.]

Date or Week	Activity, Assignment, and/or Topic	Pages/ Due Dates/Tests
	Automotive Background and Overview	
	Vehicle Chassis Identification	
	Careers in the Automotive Service Industry	
	Vehicle Service Facility Visit	
	Starting a Career in the Automotive Industry	
	Sample Resume, Sample Cover Letter, Job Shadowing	
	Working as a Professional Service Technician	
	Work Order	
	Technician Certification	
	ASE Technician Certification	
	Shop Safety	
	Shop Safety Checklist, Fire Extinguisher	
	Environmental and Hazardous Materials	
	Material Safety Data Sheet (MSDS)	
	Fasteners and Thread Repair	
	Thread Repair	
	Hand Tools	
	Hand Tool Identification	
	Power Tools and Shop Equipment	
	Power and Shop Equipment Safety Survey	

Vehicle Lifting and Hoisting

Vehicle Hoisting

Measuring Systems and Tools

Micrometer, Vernier Dial Caliper, Feeler Gauge, Straight Edge, Dial Indicator, Telescopic Gauge

Service Information

Vehicle Service History, Technical Service Bulletin, Service Manual Usage

Vehicle Identification and Emission Ratings

VIN Code, Vehicle Emission Control Information, Vehicle Safety Certification Label

Gasoline Engine Operation

Gasoline Engine Identification, General Engine Specifications

Diesel Engine Operation

Diesel Exhaust Fluid

Under Hood Inspection

Air Filter/Housing Inspection, Accessory Drive Belt Inspection, High-Voltage Circuits Identification

Lube, Oil, and Filter Service

Engine Oil Change, Exhaust System Inspection

Engine Cooling System

Cooling System Pressure Test, Test and Replace Coolant, Remove and Replace Thermostat

Engine Condition Diagnosis

Fluids Check, Fluid Leak Diagnosis, Oil Leak Diagnosis, Oil Pressure Measurement, Paper Test, Vacuum Testing, Power Balance – Manual Method, Power Balance – Scan Tool Method, Compression Testing Running Compression Test, Relative Compression, Cylinder Leakage Test, Verify Engine Operating Temperature

In-Vehicle Engine Service

Remove and Replace Timing Belt, Valve Adjustment, Hybrid Engine Service Precautions

Gaskets and Sealants

Cover Gasket Replacement

Electrical Fundamentals

Electrical Fundamentals

Electrical Circuits

Electrical Circuit Problems, Identify/Interpret Electrical Systems Concerns

Series, Parallel, and Series-Parallel Circuits

Series Circuit Worksheet #1, Series Circuit Worksheet #2, Series Circuit Worksheet #3, Parallel Circuit Worksheet #1, Parallel Circuit Worksheet #2, Parallel Circuit Worksheet #3, Series-Parallel Circuit Worksheet #1, Series-Parallel Circuit Worksheet #2, Series-Parallel Circuit Worksheet #3

Circuit Testers and Digital Meters

Digital Multimeter Use for Electrical Problems, Test Light Usage, Circuit Testing Using a Fused Jumper Wire

Automotive Wiring and Wire Repair

Fusible Links, Circuit Breakers, and Fuses, Wire Repair

Wiring Schematics and Circuit Testing

Trace Electrical Circuits

Batteries

Key Off Battery Drain Test, Battery Tests, Electronic Memory Saver Usage, Inspect and Clean the Battery Battery Charging, Jump Starting, Reinitialization, Hybrid Auxiliary Battery

Cranking System

Inspect and Test Starter Switches and Connectors, Starter Relays and Solenoids, Starter Current Draw Test Starter Circuit Voltage Drop, Remove and Install the Starter

Charging System

Alternator Drive Belt Inspection, Charging System Output Test, Charging Circuit Voltage Drop, Remove and Install Generator (Alternator)

Lighting and Signaling Circuits

Inspect Interior and Exterior Lamps, Headlight Replacement and Aiming, High-Intensity Discharge Headlights Brake Stop Light System

Driver Information and Navigation Systems

Reset Maintenance Indicators

Horn, Wiper, and Blower Motor Circuits

Wiper/Washer Operation/Wiper Blades

Accessory Circuits

Door Panel, Anti-Theft and Keyless Entry Systems

Airbag and Pretensioner Circuits

Airbag Disarming

Heating and Air-Conditioning Components and Operation

Identify Air Conditioning Components

Heating and Air-Conditioning System Inspection

Inspect A/C Compressor Drive Belt, Check A/C Condenser for Airflow Restriction, Cooling and Heater Hose Inspection, Inspect Cabin Filter and A/C Ducts, Identify Source of A/C Odors, Hybrid Vehicle A/C System Precautions

Ignition System

Secondary Ignition Inspection and Testing, Spark Plugs Inspection

The Fuel Delivery System

Replace Fuel Filter

Fuel Injection Systems

Air Intake Inspection

Emission Control Devices

PCV System Inspection

Hybrid Electric Vehicles

Hybrid Vehicle 12-Volt Auxiliary Battery Service, Regenerative Braking System

Scan Tools and Diagnostic Procedures

OBD II Monitors, Scan Tool Diagnosis

Tires and Wheels

Tire Information

Tire Pressure Monitoring Systems

Tire Pressure Monitoring System

Tire and Wheel Service

Tire Inspection and Air Loss, Tire Rotation, Install Wheel on Vehicle, Tire Replacement, Tire Repair

Front Suspension Service

Inspect Control Arms and Jounce Bumper, Ball Joint Inspection, Inspect Coil Springs and Torsion Bars Front Stabilizer Bar Bushings/Links, Inspect Strut and Bearing, Inspect and Replace Shock Absorbers

Rear Suspension Service

Inspect Rear Suspension Leaf Springs and Arms

Steering Linkage Service

Inspect Steering Linkage Components

Power-Assisted Steering Systems

Power Steering System Service, Electric Power Steering Service

Wheel Alignment

Pre-Alignment Inspection

Braking System Components

Brake System Operation Road Test, Traction Control/Stability Control Components

Brake Hydraulic Systems

Brake Pedal Height, Master Cylinder, Brake Warning Light System

Brake Fluid and Lines

Brake Hose and Line Inspection, Brake Fluid, Brake Fluid Contamination Test

Brake Bleeding

Manual Brake Bleeding, Pressure Brake Bleeding, Vacuum Brake Bleeding, Gravity Brake Bleeding

Brake Fluid Flush and Fill

Wheel Bearings

Wheel Bearing Service, Wheel Bearing and Race Replacement

Drum Brakes

Drum Brake Service, Wheel Cylinder Inspection and Replacement, Pre-Adjustment of Brake Shoes

Install Wheel and Torque Lug Nuts

Disc Brakes

Disc Brake Caliper Inspection, Caliper Mounting and Slide, Remove and Inspect Disc Brake Pads

Disc Brake Caliper Assembly, Brake Pad Wear Indicator System, Remove and Replace a Disc Brake Rotor

Brake Pad Break-In Procedure, Disc Brake Integral Parking Brake Service

Parking Brakes

Parking Brake Adjustment, Parking Brake Indicator Light

Drum/Rotor Machining

Brake Drum Measurement, Machining a Brake Drum, Brake Rotor Measurement, On-the-Vehicle Lathe

Machining a Brake Rotor Off Vehicle

Power Brake Systems

Vacuum Power Brake Booster Test, Vacuum Supply/Manifold or Auxiliary Pump

Clutches

Inspect the Hydraulic Clutch

Manual Transmissions/Transaxles

Check Manual Transmission/Transaxle Fluid, Drain and Fill Manual Transmission/Transaxle

Drive Shafts and CV Joints

Front Wheel Drive Bearings and Hubs, Service Drive Shafts and Joints

Drive Axles and Differentials

Differential Assembly Service, Inspect and Replace Drive Axle Wheel Studs

Four-Wheel-Drive and All-Wheel Drive

Inspect Front Locking Hubs, Transfer Case Lube Level Check

Automatic Transmissions Parts and Operation

Describe Operation of a Continuously Variable Transmission, Describe the Operation of a Hybrid Vehicle

Drive Train, Describe Operation of Dual-Clutch Automatic

Automatic Transmissions Service

Check Fluid Level with a Dipstick, Check Fluid Level without a Dipstick, Check ATF Condition and Leaks

Inspect and Adjust External Linkage, Inspect Power Train Mounts, Drain and Replace Fluid and Filter(s)

Used Vehicle and Pre-Delivery Inspections

Used Vehicle Inspection, Pre-Delivery Inspection

*****Tentative, subject to change without prior notice*****