

Introduction to Automotive Technology

Auto 80 Course Syllabus

Course Information

Course title: Introduction to Automotive Technology

Course number: Auto 80

Section number: 4186

Units: 3.0

Prerequisites: None

Recommended: Course Eligibility for ENGL 100
or Course Eligibility for ESL 100.

Classroom: Room 2360, located in Lounibos Hall.

Lab: Room 2329, the “JC AutoShop”, also in Lounibos Hall.

Class Hours: Friday from 9:30pm to 12:00pm (lecture) and
Friday from 1:00pm to 3:30pm (lab)

Course Description

This course provides an introduction to the field of automotive technology from the viewpoint of an automotive technician. It begins with an overview of the automotive industry and employment possibilities in the automotive business. It then covers the working world of an auto technician and what is expected of the tech. We will talk about certifications that a technician is typically expected to hold and progress into the very important topics of shop safety and environmental concerns. Then we study the basics of tools, fasteners, and measuring systems. After a brief discussion of repair information systems used in modern auto shops, the balance of the class is spent briefly exploring all of the mechanical, hydraulic and electrical systems used in automobiles.

Instructor Information

Name: Juan Roman Medina

Bio: I have over 20 years of experience in the automotive industry beginning with shop class at Piner High School. I was a student of the Automotive Technology program at Santa Rosa Junior College and excelled during my time in the program that Pat Sullivan who was Department Chair at the time, asked me to become his teaching assistant which enabled me to learn teaching skills to become an instructor. It wasn't until I left the junior college and gained real life experience working as an automotive mechanic. Working at Penske Auto as a regional trainer allowed me to learn how to engage with students and deliver information in a method in which they could learn, retain, and employ the new information provided to them.

As I continued with my automotive career and by earning my bachelor's degree, I have found myself wanting to teach, specifically in a field that interests and engages me, automotive technology but even more so wanting to teach the next generation of students.

I am bilingual in Spanish and English and feel that these skills along with my ability to empathize with students from an array of cultures, socio economic statuses, and generations will allow me to provide a richer educational experience to the students enrolled in the Automotive Technology program.

Office: 2306 Lounibos Hall

Office hours:
Fridays 8:30 am to 9:30am or by appointment.

AutoShop phone number: 527-4495 x1765

Cell Phone: (707) 494-8891

Email address: jromanmedina@santarosa.edu

Materials Needed

NOTE: Some of these supplies will be furnished at your first class meeting

do not purchase supplies until after the first class meeting.

1. Assigned E-Book. (Purchase Prior to Class)
2. A three ring binder to organize your class materials.
3. Scantron sheets to take quizzes and exams. Three packages of six should be enough.
4. Number 2 pencils (for scantrons).
5. Pens and note paper for taking notes.
6. Recording device for taking notes (optional).

Outcomes and Objectives

Student Learning Outcomes:

Students will be able to:

1. Demonstrate the correct use of basic tools and safety procedures utilized by an automotive repair technician.
2. Apply with proficiency the basic maintenance and repair of the automobile and its systems.

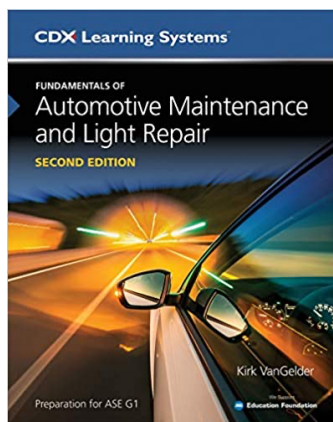
Objectives:

Upon completion of this course, students will be able to:

1. Apply safety standards and practices in an auto shop environment
2. State the theory behind the operation of all of the basic systems on an automobile.
3. Describe and identify the components used in those systems.
4. Demonstrate a working knowledge of the basic operation of all major automobile systems.

5. Describe the environmental issues and apply appropriate procedures involved with disposal of hazardous material from the automobile when repairing or disposing of the vehicle.
6. Identify and properly use and care for tools and equipment.
7. Discuss the automotive industry and identify related employment opportunities.
8. Discuss professional and ethical responsibility both personal and in the automotive industry.

Textbook:



Automotive Maintenance and Light Repair
Second Edition
by Kirk VanGelder
(ISBN-9781284200553)

Topics and Scope

1. Automotive Background Overview and Safety Foundation
 - a. Careers in the Automotive Service Industry
 - b. Starting a Career in the Automotive Industry
 - c. Working as a Professional Service Technician
 - d. Technician Certification
2. Engine Fundamentals
 - a. Motive Power Theory-SI Engines
 - b. Engine Mechanical Testing
 - c. Lubrication System Theory
 - d. Servicing The Lubrication System
 - e. Cooling System Theory
 - f. Servicing The Cooling System
3. Automatic Transmissions
 - a. Automatic Transmission Fundamentals
 - b. Maintaining the Automatic Transmisssion/Transaxle
 - c. Hybrid and Continuously Variable Transmissions
4. Manual Transmissions
 - a. Transmission/Transaxle Principles
 - b. The Clutch System
 - c. Driveshafts, Axles, and Final Drives

5. Steering and Suspension
 - a. Wheels and Tires Theory
 - b. Servicing Wheels and Tires
 - c. Steering Systems Theory
 - d. Servicing Steering Systems
 - e. Suspension Systems Theory
 - f. Servicing Suspension Systems
 - g. Wheel Alignment
6. Brakes
 - a. Principles of Braking
 - b. Hydraulics and Power Brakes Theory
 - c. Servicing Hydraulic Systems and Power Brakes
 - d. Disc Brake Systems Theory
 - e. Servicing Disc Brakes
 - f. Drum Brake Systems Theory
 - g. Servicing Drum Brakes
 - h. Wheel Bearings
 - i. Electronic Brake Control
7. Electric
 - a. Principles of Electrical Systems
 - b. Electrical Components and Repair
 - c. Meter Usage and Circuit Diagnosis
 - d. Battery Systems
 - e. Starting and Charging Systems
 - f. Lighting Systems
 - g. Body Electrical System
8. Heating and Air Conditioning
 - a. Principles of Heating and Air Conditioning Systems
9. Engine Performance
 - a. Ignition Systems
 - b. Gasoline Fuel Systems
 - c. Engine Management System
 - d. On-Board Diagnostics
 - e. Intake and Exhaust
 - f. Emission Control
 - g. Alternative Fuel Systems

Assignments

1. Reading, approximately 25 pages per week.
2. Homework from reading assignments.
3. Lab assignments with worksheets. (Three people per group)
4. 8 Quizzes, Midterm + Final Exam.

Lab Activities

Lab activities consist mostly of shop demonstrations related to classroom lecture/discussion topics. There will also be numerous worksheets and exercises that are coordinated with, and related to, classroom lecture/discussion topics. There will be chances to work on vehicles owned by students or staff, but only as they relate to current or past topics covered in this class. **The lab/shop sessions are not to be used for personal vehicle maintenance or hobby projects.** At the instructor's discretion, and if class progress is good, an open shop session may be scheduled for personal vehicle inspection and maintenance.

The following Lab procedures and precautions must be observed:

- ✘ **Safety First!**
- ✘ Safety glasses must be worn when working on a vehicle, i.e. under the hood, under a raised vehicle, doing brake work, working with aerosols or other chemicals, and for all other potentially hazardous situations. **When in doubt, wear your safety glasses!**
- ✘ Safety glasses must be worn when working with hazardous equipment, i.e. rotating devices such as grinders, brake lathes, drills, etc.
- ✘ Safety glasses must be worn when working with striking tools, i.e. hammers, chisels, punches, air chisels, etc.
- ✘ No jewelry may be worn when working in the shop. This includes rings, necklaces, and anything that hangs loose or may dangle into a rotating device or a potential electrical shock area.
- ✘ No loose clothing is allowed while working in the Lab. Loose attire may become tangled in machinery.
- ✘ Long hair must be tied back or secured in some fashion. Loose hair may become tangled in machinery and torn off or result in even greater bodily damage.
- ✘ **No sandals in the Lab or open toe shoes!** Non slip sole work shoes/steel toe shoes are preferred during lab, but in all cases closed toed shoes must be worn.
- ✘ You must know where the fire extinguishers, first aid kit, eye wash stations, and shower stations are located, and **be familiar with how to use these safety items.**

Work sheets and lab assignments must be signed by the instructor immediately upon completion. **Do not move on to another job until the current assignment is checked off by the instructor!**

You are expected to arrive at work (the Lab) on time and stay until quitting time (end of Lab). If you must leave early, check with your instructor first. Attendance is a part of your final grade!

Course Schedule and Outline

The instructor will make the *Syllabus* and *Weekly Class Schedule* available on the Canvas Learning Management System prior to the first class meeting. It will contain detailed class information concerning:

- ✗ Important dates
- ✗ Reading assignments
- ✗ Due dates for written assignments
- ✗ Quizzes
- ✗ Examination dates

Online Activities

Visit the class section on Canvas to check information on upcoming assignments and exams. Use the discussion boards there to stay in touch with classmates or ask questions on class related topics. You can also follow your grade progress as your grade points are posted throughout the semester.

Canvas

You will have access to your grade progress, upcoming assignments, and announcements via your Canvas account. This is the primary way that I will communicate with you. Be certain that you have valid email addresses and that your “notifications” are set up so that you will receive announcements in the way that you prefer.

Course Policies

Cell Phones: Cell phones are not allowed while in class or lab. This is also a common employer’s shop rule (no cell phone use during work hours). Note: if you receive an emergency call, please step outside to talk.

Cheating/Plagiarism: Cheating or plagiarism are unacceptable behavior and will result in an immediate two day suspension from class for all students involved; **no exceptions**.

Attendance/Tardiness: Your attendance is expected at all class meetings and tardiness is not acceptable. Consider this as valuable training for the work place, your employer will expect you to be at work daily. You are expected to remain in class or lab until dismissed by the instructor (this policy is also common in an employee/employer relationship)

Attendance at all classroom and lab sessions is expected. Missing more than 10% of this time can result in being dropped from the class. We only meet 17 times!

What this means is that **no more than 2** class days can be missed.

This means you will be dropped from the roster if you miss 3 class days.

No Smoking Policy: Santa Rosa Junior College is a non-smoking campus, this now includes “vaping”. No smoking is allowed anywhere on campus or within 20 feet of the campus.

No Drugs and Alcohol Policies: Santa Rosa Junior College is a Drug Free campus.
<https://police.santarosa.edu/health-safety-regulations>

No Sexual Harassment and Unlawful Discrimination: Sexual Harassment is prohibited on-campus <https://police.santarosa.edu/health-safety-regulations>

Class Participation: Your participation in class discussions is recommended and expected. Asking questions is a short cut to knowledge.

Missed Examination Policy: **Missed examinations are discouraged, but may be rescheduled with the instructor on a case-by-case basis up to two weeks past the original exam date.**

Late Homework / Assignment Policy: **Homework and all other types of assignments will only be accepted up to two weeks late.**

Lab Safety: Safe procedures take precedence over everything else in our shop! Safe clothing must be worn at all times. Safety glasses must be worn when working on projects in the shop.

Class Disruption: Be respectful of your classmates and instructor. **Please do not engage in disruptive activities such as these:**

- ✗ Monopolizing the class discussion and interrupting others while they speak. Participation is a good thing, but monopolizing the class is not.
- ✗ Carrying on private conversations during class. You may think that your voices are low, but be assured that all in the class are hearing you. This murmuring breaks the attention of the students and instructor. If your conversation concerns the class topic, we are very glad that you are excited about the topic and your studies. We don't wish to discourage you, but please wait until a proper time to discuss your interests; i.e. when the instructor asks for questions or input, or during a class break. Keep notes of topics and issues that peak your interest, and bring them up at an appropriate time.
- ✗ Bringing pets to class, unless the pet is a registered aid animal (check with DRD).
- ✗ Bringing children to class.
- ✗ Eating in class. It's disruptive due to noise and may smell offensive to others.

Student Conduct Policies:

Please visit the following web links and familiarize yourself with the policies of SRJC concerning student conduct. You are responsible for your conduct and complying with SRJC policies.

http://www.santarosa.edu/for_students/rules-regulations/student-conduct.shtml

http://www.santarosa.edu/for_students/rules-regulations/academic-integrity.shtml

Tests and Quizzes

- You will be given periodic chapter quizzes. ***Check your copy of the weekly class schedule regularly for exam dates.***
- You will be given a midterm examination and a final examination.
- ***Final examination will be administered on:
Friday, May 20, 2022 - 9:30 AM – 12:00 PM***

Study Tips

- ***Take notes during class***, and use your class notes to study for exams.
- Use your lab sheets as a study tool and to increase your final grade. ***Neatness and content quality count toward your grade!***
- Keep your quizzes and use them to study for midterm and final exams.

Grading

Your grades will be based on the following areas and count in the percentages noted:

Problem solving: Assessment tools, *other than exams* that demonstrate competence in computational or non-computational problem solving skills.

Homework will account for 5% (50 points) of your grade total.

Problem Solving
5 - 10%

Skill and Hands On Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Skill demonstrations and worksheets will account for 10% (100 points) of your grade total.

Skill Demonstrations
5 - 10%

Exams: All forms of formal testing, *other than skill performance exams*.

Multiple choice quizzes and examinations will account for 75% (750 points) of your grade total.

Exams
75 - 80%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation will account for 10% (100 points) of your grade total.

Other Category
5 - 10%

Extra Credit: In addition to the four grading areas noted above, you can receive up to 25 extra points for: completing a library tour, visiting a counselor, turning in a written report, 15 minute presentation on a discussed topic, or completing repair jobs in the shop that are not part of the regular worksheet assignments.

Extra Credit
Up to 50 points

Unless otherwise informed by the instructor, grades are calculated based on total semester points that you have earned. Grades may be adjusted to a class curve, but you are guaranteed the grade listed in the following chart if you attain the point total associated with that grade.

Letter grade A = 90% - 100% (greater than 500 points)

Letter grade B = 80% - 90% (800-899)

Letter grade C = 70% - 80% (700-799)

Letter grade D = 60% - 70% (600-699)

Letter grade F = ≤ 60% (less than 600)

Follow your grade totals online. You will start at zero points and are working for a maximum total point count of approximately 1000 (look on Canvas to determine this semester's exact count). Remember that the midterm and final exams count triple (x3).

You may also accumulate points for extra credit work (raising the total points possible to greater than the nominal total of 1000 points) – note that your grade at 1075 will still be an “A”; the grade scale doesn't alter. Much of this extra credit work will be repair jobs that are performed on customer's vehicles. All of this work must be verified with a repair order (available from the tool room) to receive credit. The repair order must be neatly, accurately, and completely filled out and all diagnostic and repair steps must be thoroughly, and in detail, written on the repair order to receive full credit.

Emergency Evacuation Plan

In the event of an emergency during class that requires evacuation of the building, please leave the building immediately, but calmly. **Our class will meet at the South end of Lounibos Hall in the parking lot** to make sure everyone got out of the building safely and to receive further instructions. If you are a student with a disability who may need assistance in an evacuation, please see me during my office hours as soon as possible so we can discuss an evacuation plan.

Campus Resources

SRJC has many resources for its students. These are only a few of them. Please refer to the SRJC website for more information (www.santarosa.edu). Click the “For Students” tab, then the “Student Services” tab.

DRD (Disability Resources Department)

If you are having trouble learning or understanding in class and don't know why, you can get a free consultation at DRD. ***It may change your life!***

Just a few of the DRD services:

- ✕ Disability screening
- ✕ Test taking help
- ✕ Aids for the physically disabled

Santa Rosa Campus DRD Office information:

Email: disabilityinfo@santarosa.edu

Phone: (707) 527-4278

TTY: (707) 528-2442

Fax: (707) 524-1768

Office Location: Room 637, Analy Village, Bldg. C

Office Hours:

Fall & Spring Semesters: Monday-Friday, 8:00 AM to 4:00 PM

Summer Semester: M-Th, 8:00 AM to 4:00 PM, Closed Friday

Mailing Address:

Santa Rosa Junior College

Disability Resources Dept.

1501 Mendocino Avenue

Santa Rosa, CA 95401-4395

College Skills/Tutoring Department

- ✕ ESL (English as a second language)
- ✕ Math skills improvement
- ✕ Writing skills classes

The College Skills Department is located in Analy Village, on the west side of campus.

The Academic Skills Lab is located in Building H, Rm 601.

The Math Lab is in Building F, Rm 615.

The Department Office is in Building G, Rm 605.

The Phone Number is (707) 527-4834.

Counseling Department

Santa Rosa Campus

Bertolini Student Center, 2nd Floor

(707) 527-4451

M, T, Th, F, 8:00 AM - 5:00 PM

W, 8:00 AM - 7:00 PM

Closed Fridays during June & July

“As a new student, seeing a counselor is probably the most important thing you can do”. You don’t need to go through SRJC without a clue! Hook up with a counselor. You may just find a friend, guide and advocate in the Counseling Department. At the least, you will formulate a plan of study and explore your interests and life possibilities.

Doyle Library

- ✕ Tutoring
- ✕ Computer use (free)
- ✕ Coffee shop
- ✕ Quiet study space

Accommodations for Students with Disabilities

If you need disability related accommodations for this class, such as a note taker, test taking services, special furniture, helper animal, etc., please provide the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) to the instructor as soon as possible. You may also speak with the instructor privately during office hours about your accommodations. If you have not received authorization from DRD, it is recommended that you contact them directly. DRD is located in Analy Village on the Santa Rosa campus, and Jacobs Hall on the Petaluma Campus.

Attendance:

According to the SRJC policy, **two missed days is considered excessive absence from Auto 80**. If you miss 3 days, you will be **dropped** from the roster. In some cases this may result in a failing grade for the class.

Please e-mail, text, or call if you are going to be late or absent for any class sessions. And remember that your reasons for not doing what you said you would do are not the same as having done what you said you would do. You said you would be in class!

This syllabus is an agreement, continued participation in this class means that you agree to the policies and procedures outlined in this syllabus.

This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the instructor reserves the right to modify, supplement and make changes as the course needs arise.

David Lemmer Pedagogical Philosophy

My philosophy is to provide you with the basic science and theory behind all of the automotive systems covered in class. In addition I will give you practical, hands on tips for being a successful automotive technician. Ultimately, my goal is to empower you to think for yourselves to create problem solving techniques that you can use in any situation for the rest of your lives. Key to success here is communication, cooperation, creativity, and a desire for excellence. Automotive technology is evolving as rapidly now as it ever has. Keeping up with that promises to be as rewarding as it is challenging. I promise to be your partner and mentor as you begin your trek down this path.

DL Lemmer

