

Introduction to Automotive Technology

Auto 80 Course Syllabus

Course Information

Course title: Introduction to Automotive Technology

Course number: Auto 80 Section Number: 4237

Units: 3.0

Prerequisites: None

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

Classroom: Online in TechConnect Zoom (zoom). See Canvas for the links.

Lab: At home, on your own, or online. See Canvas for instructions.

Class Hours: Tuesdays and Thursdays from 1:30pm to 3:00pm on zoom.
The rest of the time obligation is up to you and your personal schedule.

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: David J. Lemmer

Office: Home

Office hours:

Thursdays from 3:30pm to 5:00pm by phone or by zoom.

Cell Phone: (707)695-4250c

Email address: dlemmer@santarosa.edu

Materials Needed

1. Assigned text book. (Purchase Prior to Class)
2. Pens and note paper for taking notes.
3. A computer (desk top or laptop), a smart phone alone is not recommended.
4. A robust, stable high-speed internet connection.

Note: if you do not have access to a computer and internet contact the instructor.

Outcomes and Objectives

Student Learning Outcomes:

Students will be able to:

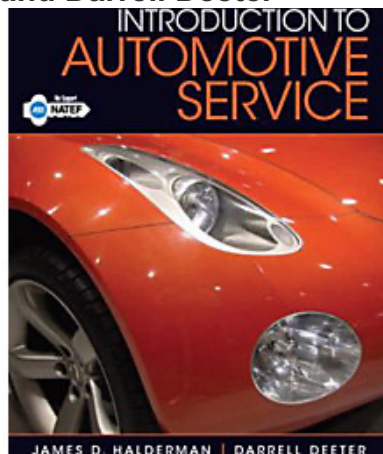
1. Demonstrate the correct use of basic tools and safety procedures utilized by an automotive repair technician.
2. Apply with proficiency the basic maintenance and repair of the automobile and its systems.

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.

**Textbook: Introduction to Automotive Service
by James D. Halderman and Darrell Deeter**



(ISBN-9780134546865)

Topics and Scope

1. Automotive Background and Overview
 - 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. Shop Fundamentals
 - a. Shop Safety
 - b. Environmental and Hazardous Materials
 - c. Fasteners and Thread Repair
 - d. Hand Tools
 - e. Power Tools and Shop Equipment
 - f. Measuring Systems and Tools - English and Metric
 - g. Service Information
3. Engine Fundamentals
 - a. Vehicle Identification and Emission Ratings
 - b. Gasoline Engine Operation
 - c. Diesel Engine Operation
 - d. Engine Lubrication and Cooling Systems
 - e. Under-Hood Inspection
 - f. Vehicle Lifting and Hoisting
 - g. Lube-Oil and Filter Service
4. Electrical Fundamentals
 - a. Electrical Circuits
 - b. Circuit Testers and Digital Meters
 - c. Starting and Charging Systems
5. Electronic Accessories
 - a. Dash Warning Lights and Driver Information Systems
 - b. Lighting Systems
 - c. Safety Belts and Airbag Systems
 - d. Heating and Air Conditioning Systems
6. Electronics, Performance and Emissions
 - a. Gasoline and Alternative Fuels
 - b. Computers and Sensors
 - c. Ignition System
 - d. Fuel-Injection Systems
 - e. Emission Control Devices
 - f. Hybrid Electric Vehicles
 - g. Scan Tools and Diagnostic Procedures
7. Brakes and Inspection
 - a. Tires and Wheels
 - b. Brakes and Antilock Braking Systems
 - c. Suspension and Steering Systems
8. Drive Line
 - a. Manual Transmissions/Transaxles
 - b. Automatic Transmissions and Transaxles

Assignments

1. Reading, approximately 25 pages per week.
2. Homework quizzes from reading assignments.
3. Lab assignments with worksheets and third party certificates.
4. Mid-Term + Final Exam.

Lab Activities

Lab activities will consist of individual research and inspection activities conducted remotely. Some will be interactive with outside web sources, some will involve vehicles that students have access to. No lab activities will require anything that might disable or damage the vehicle being inspected. The following safety admonishments are typical of work in an automotive shop setting.

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.
 - No long hair is allowed unless it is securely 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!** Non slip sole work shoes are preferred, 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.**

Follow the directions from each module in Canvas. Some activities require watching a video and writing down your observations. Some require visiting a third party website and interacting with the materials there and completing a certificate. After completing the work for that module you will post the results through Canvas. To facilitate student-to-student contact there will be discussion boards in each module where you will be required to post your own opinions and respond to the opinions of others. Hopefully, you will sound like automotive professionals and won't be like the trolls on facebook!

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 assignments
- Due dates for discussions
- 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 on all zoom meetings and tardiness is not acceptable. Please make sure that your first and last name appear as your zoom log-in or you will not be admitted to the “room”. This is how I will take roll. 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 the conference until dismissed by the instructor.

Attendance at all zoom sessions is expected. Missing more than 10% of this time can result in being dropped from the class. We will meet 32 times this semester! What this means is that **no more than 4** zoom meetings can be missed.

Refer to the SRJC Attendance Policy for more information.

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. We won’t be on campus, but if you are going to work on cars, I recommend you not smoke, there are already many cancer causing chemicals in the industry. Be safe, be healthy.

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.

Late Homework / Assignment Policy: Homework and all other types of assignments will be accepted after the due date with penalties accruing.

Lab Safety: Safe procedures take precedence over everything else in any 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 pique 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.

Student Conduct:

<https://go.boarddocs.com/ca/santarosa/Board.nsf/goto?open&id=A8JTGP775682>

Academic Integrity:

<https://go.boarddocs.com/ca/santarosa/Board.nsf/goto?open&id=A63TJQ77A2C8>

Tests and Quizzes

- ***There will be a midterm examination due by midnight on:
Saturday, April 3rd***
- ***Final examination will be due by midnight on:
Friday, May 28th***

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 knowledge.
- ***Keep your homework*** 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.

Problem Solving 10%

Homework will account for 10%
(100 points) of your grade total.

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

Skill Demonstrations 10%

Skill demonstrations and worksheets will account for 5% (50 points) of your grade total.

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

Exams 70%

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

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

Other Category 10%

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

Extra Credit: In addition to the four grading areas noted above, you can receive up to 100 extra points for: completing a library tour, visiting a counselor, turning in a written report, or completing repair jobs in the shop that are not part of the regular worksheet assignments.

Extra Credit Up to 100 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 900 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 = $\leq$ 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.

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 (<https://www.santarosa.edu/>).

Click the “For Students” tab, then the “Student Services” tab.

Note: Many campus resources are still closed to the public! Check the website first!

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 Hours:

Monday-Thursday, 8:00 AM to 5:00 PM

Fridays, 8:00 AM to 12:00 PM

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

(707) 527-4451

REMOTE DROP-IN HOURS:

Monday 9:00am - 5:00pm

Tuesday 9:00am - 7:00pm*

Wednesday 9:00am - 7:00pm*

Thursday 9:00am - 4:00pm**

Friday 9:00am-3:00pm

“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 SRJC district policy, **four missed zoom sessions is considered excessive absence from Auto 80**. If you miss 4 of them, you can be **dropped** from the roster.

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.

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.

DJ Lemmer