Syllabus for AT-10

Course Information

Semester & Year: Fall 2021
Course ID & Section #: AT-10-E2514 Introduction to Automotive Technology
Instructor's name: Anibal Florez
[if synchronous] Day/Time of required meetings: Tuesdays and Thursdays at 8:15am – 12:35pm
[if in-person] Location: Lecture room AT-128, Automotive shop AT-129
[if needed] Number of proctored exams: No proctored exams.
Course units: 4

Instructor Contact Information

Office location or *Online: AT-141 is my campus office.
Office hours: By appointment or stop by.
Phone number: 707-476-4373 is my office.
Email address: Anibal-Florez@redwoods.edu

Catalog Description

The Maintenance and Light Repair (MLR) certificate is part of the Automotive Technology Program. It is designed as an entry level certificate, recognizing the knowledge and skills industry has identified as required for employment for entry level technicians. The development of this certificate will provide a pathway of stackable credentials leading to the AS Automotive Technology.

Course Student Learning Outcomes

1. Research and perform routine maintenance on a modern vehicle.
2. Exhibit proficiency with precise measurement instruments.
3. Perform routine inspections and repairs on a modern vehicle.

Prerequisites/co-requisites/ recommended preparation

There is no specific prerequisite or preparation for this class.

Accessibility

Students will have access to online course materials that comply with the Americans with Disabilities Act of 1990 (ADA), Section 508 of the Rehabilitation Act of 1973, and College of the Redwoods policies. Students who discover access issues with this class should contact the instructor.

College of the Redwoods is also committed to making reasonable accommodations for qualified students with disabilities. If you have a disability or believe you might benefit from disability-related services and accommodations, please contact your instructor or Disability Services and Programs for Students (DSPS). Students may make requests for alternative media by contacting DSPS based on their campus location:

- Eureka: 707-476-4280, student services building, 1st floor

During COVID19, approved accommodations for distance education classes will be emailed to the instructor by DSPS. In the case of face to face instruction, please present your written accommodation request to your instructor at least one week before the first test so that necessary arrangements can be made. Last-minute arrangements or post-test adjustments cannot usually be accommodated.

Textbook information

Title & Edition: Automotive Maintenance and Light Repair

Author: Rob Thompson

ISBN-13: 978-1-337-56439-7

Technology

During this Fall semester this course will be in part online. This means that each student must be aware of the technological requirements to be successful in this class.

Each student will be responsible for completing tasks online via CANVAS. This includes homework, watching demonstration videos and recorded lecture materials, and possibly communicating with your instructor as well as other students. This is in addition to our time together in both the lecture room and shop.

This means that students will have a greater chance of success with a laptop or home computer and access to WiFi.

Online courses require adequate computer skills. If you are worried about your computer skills, please let me know, because I can help. But to check yourself before we get started, you should be able to:

- navigate a class in Canvas
- receive and respond to messages sent to your CR email account (People! - this means you need to CHECK your CR email!)
- use a word processor program (such as Microsoft Word or Google Docs)

It is your responsibility to meet the technological demands of the course, which may often include troubleshooting technological adventures.

Computer and Hardware Requirements

- Computers: You should plan on watching the recorded lectures on line and be able to do your homework on line from a reasonably recent model notebook or desktop computer (Mac or PC). We don't recommend that you plan on participating in this class solely from a portable device (phone or tablet). Please let me know if this will be an issue for you, and we can try to help.
- Portable Devices: You can use recent model portable devices (such as Android or iOS phones & tablets) for some things in this class. If you do decide to use your portable device for some of your class work, use the free Canvas app (called "Canvas by Instructure") available in iTunes (for iOS) and the Google Play Store (for Android). This app is much better than trying to connect to Canvas using a web browser on a portable device.

Connection and Software Requirements

It is important that you set yourself up for success by making sure that you have the necessary internet connection and software in order to participate fully in the course. Please make sure that you have the following set up by the first week of class:

- High-speed internet: You should have high-speed internet (such as broadband) service from cable, DSL, or satellite providers as there are video lectures as part of this course, and they require this speed. You need to have reliable access to the internet for the duration of the course. Anticipate problems with your computer and internet access (including power outages) by not waiting until the last minute to submit assignments. It is your responsibility to meet the class deadlines.
- Browsers - You will need to use the most recent version of one of the following browsers in order to best access the course and activities; Mozilla Firefox (10 or higher), Chrome (54.0.2840.99 m or higher), or Safari (1.2 or higher). We don't recommend using Internet Explorer as it doesn't seem to play well with Canvas.
- Word Processing - You may need Microsoft Word for writing assignments in the class. But we have good news! All students at CR have access to Office 365 (Word, PowerPoint, Excel, and OneNote) free with a valid @mycr.redwoods.edu email account. Go to https://office.com/getoffice365 (Links to an external site.) to get started. (There are also free options for tools like this, such as Google docs (Links to an external site.) or OfficeLibre. (Links to an external site.) Google docs requires a gmail account, which your mycr email actually IS.)
- Acrobat Reader – Adobe Acrobat Reader DC (Links to an external site.) is a free program that will allow you to read and download pdf files.
- Technology Support: Before contacting Technical Support please visit the Online Support Page (Links to an external site.). For password issues with Canvas, Web Advisor or your mycr.redwoods.edu email, contact its@redwoods.edu or call 707-476-4160 or 800-641-0400 ext. 4160 between 8:00 A.M. and 4:00 P.M., Monday through Friday.

Communication Guidelines

- Response times to emails and messages – in general I will reply withing a couple of business days.
- My general availability – Office hours by appointment, email and phone anytime.
    - I prefer emails but you can call my office anytime. Emails are usually the better way.
- Come on by! Even if its outside of any office hour scheduled.
- Timeline for offering substantive feedback on assignments – in general about a week.
- Expectations for how students should engage with each other – You are all peers taking part in the same automotive program. Each of you have different skill sets and knowledge. Everyone, including me, will benefit from open and honest communication that is respectful and encouraging. We are all in this together, let us bring each other up.

If you have a question or concern, please, please, PLEASE get ahold of me. I am very available to help you, especially as you work to figure out how to be successful in this online class. So, if you have a question, here are some guidelines to follow:

- **Might your question benefit other people in the class?** Then please post it in the related discussion forum in Canvas. This forum is included in every module in the course, so it will be easy for you to find, and I will check it at least once a day during the week and at least once over the weekend.

- **Is your message private?** Please send me a message using the messaging tool in Canvas (just click on the INBOX button in the left toolbar). You are also welcome to email me.

You can also always call me on my "on campus" office phone (707-476-4373). Regardless of how you reach out, if you don't hear back from me within 48 hours of sending your message, you can assume I did not receive it (or it got lost in my chaos)…so please resend.
Finally, **please be polite.** In person its proper etiquette in an online environment, this is called **netiquette**. Sometimes it is difficult to convey nuance or humor through written (electronic) communication. Just be respectful to your classmates and be kind, considerate, and forgiving in all of your posts in the discussion forums. Adhere to the same standards of behavior online that you follow in real life, because you don't want to forget: Real humans read your posts. After all, our Canvas space is our classroom, and we want to create a positive, collaborative, interesting community.

Note: Additional policies may be added as I deem necessary to provide you with the best learning environment possible.

Instructor Expectations of Students

Your commitment will require your time. A typical three credit hour class will require about nine hours per week of your time. You will need to carefully listen to online lectures and carefully read textbook chapters, participate in both classroom and shop activities, complete quizzes and tests including the final exam. Conscientiousness, attention to details, and skills in reading and writing are critical for success in any endeavor.

Student Expectations of Instructor

I post recorded lectures regularly for you review and prepare weekly classroom and shop activities. I will access the class website regularly and respond to posted questions and messages. Additionally, I read every chapter I assign and expect a discussion from your questions in class the next day we meet. There is also regular instructor-based communication via announcements, lectures, feedback to any discussion posts, completed labs, homework, and email/message students who fall behind.

Support for online learners during COVID-19

In response to COVID-19, College of the Redwoods moved the majority of its courses online to protect health and safety. As the faculty and students adjust to this change, clear communication about student needs will help everyone be successful. Please let me know about any specific challenges or technology limitations that might affect your participation in class. I want every student to thrive.

Supplies

1. Each student is required to purchase in advance and have available a #2 pencil or pen.
2. Safety glasses are required for all lab activities. Students are required to purchase OSHA/ANSI approved safety glasses and wear them at all times when working in the lab.
3. Work attire is recommended. Supply your own coveralls, shop coat or work pants, shirt and closed toed shoes.
4. Class textbook(s).
5. Each student should be prepared to supply any additional personal protective equipment

not furnished by the college.

Course Requirements

1. Complete the assignments and tests – Read assigned chapters prior to coming to class.
2. Access to the internet to actively participate in online assignments.
3. Actively participate in shop assignments while striving for improvement.
4. Refrain from using personal electronic devices unless it pertains to the class.
5. Must use safety glasses.
6. Everyone will comply with the latest COVID-19 Social Distancing and Safety Guidelines.
7. No student parking allowed in the automotive compound unless otherwise discussed.

Degree/Certificate

An Associate of Science Degree in Automotive Technology is available as well as Certificates of Achievement. For more information consult the college catalog for specific requirements and/or contact Counseling/Advising at 476-4150 to develop a student education plan.

Automotive Work Experience

Additional units are available for working in the field. Contact the Work Experience Coordinator at 476-4341

Course Evaluation

Your performance objectives, exams, and laboratory activities will be translated to points and points to grades. There are 1000 possible points and the following distribution will guarantee the following:

1000 - 900 = A
899 - 800 = B
799 - 700 = C
699 - 600 = D
599 - 500 = F

Course Schedule

This course is scheduled to meet twice a week. Due to current global/local events we have lowered the number or students who can enroll in a course during a semester. This means that you get to work in smaller groups and perform more of the shop related work.

This class is scheduled to meet Tuesday and Thursday evenings at 8:15am and will conclude at 12:35pm. During our allotted time we will go over assigned textbook material, work through classroom review exercises and finally discuss shop activities and conclude with hands on application in the shop.

Attendance

The college assumes that students will attend every session of a class for which they are

registered. If, however, attendance is irregular, students may be dropped from a class. Excessive absence is defined as a total of absences which equal two weeks in a 16 week semester, for a class meeting twice per week that would equate to 4 absences. For attendance purpose, the college regards a laboratory session as the equivalent of one class meeting.

Veterans and financial aid recipients should remember that should they drop below the number of units required of them by the Veterans Administration or financial aid office for any reason during the semester, including being dropped from a class for excessive absences, they will lose part of the government assistance allowances and may be required to repay funds already disbursed.

In any event if an attendance problem does develop, work with the instructor to resolve it. The purpose here is to see what we can do together to keep you in the class in order to help you master the course content.

Course Attendance Policy

Attendance will be taken at the start of each class session. **Students who accumulate 4 absences during the first 10 weeks of class will be dropped from this class by the instructor, no exceptions.**
Punctuality is essential in the workplace and is considered respectful of fellow students and instructors. Excessive tardiness can affect your score as well. Less time present means you have less time to complete tasks.

Students who have experienced extenuating circumstances can complete & submit the Excused Withdrawal Petition to request an Excused Withdrawal (EW) grade instead of the current Withdrawal (W) or non-passing (D, F & NP) grades. The EW Petition is available from the Admissions and Records Forms Webpage. Supporting documentation is required.

Academic dishonesty

In the academic community, the high value placed on truth implies a corresponding intolerance of scholastic dishonesty. In cases involving academic dishonesty, determination of the grade and of the student's status in the course is left primarily to the discretion of the faculty member. In such cases, where the instructor determines that a student has demonstrated academic dishonesty, the student may receive a failing grade for the assignment and/or exam and may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the College Catalog and on the College of the Redwoods website.

Disruptive behavior

Student behavior or speech that disrupts the instructional setting will not be tolerated. Disruptive conduct may include, but is not limited to: unwarranted interruptions; failure to adhere to instructor's directions; vulgar or obscene language; slurs or other forms of intimidation; and physically or verbally abusive behavior. In such cases where the instructor determines that a student has disrupted the educational process, a disruptive student may be temporarily removed from class. In addition, the student may be reported to the Chief Student Services Officer or designee. The Student Code of

Conduct (AP 5500) is available on the College of the Redwoods website. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the College Catalog and on the College of the Redwoods website.

Inclusive Language in the Classroom

College of the Redwoods aspires to create a learning environment in which all people feel comfortable in contributing their perspectives to classroom discussions. It therefore encourages instructors and students to use language that is inclusive and respectful.

Setting Your Preferred Name in Canvas

Students have the ability to have an alternate first name and pronouns to appear in Canvas. Contact Admissions & Records to request a change to your preferred first name and pronoun. Your Preferred Name will only be listed in Canvas. It does not change your legal name in our records. See the Student Information Update form.

Canvas Information

If using Canvas, include navigation instructions, tech support information, what Canvas is used for, and your expectation for how regularly students should check Canvas for your class.
Log into Canvas at https://redwoods.instructure.com
Password is your 8 digit birth date
For tech help, email its@redwoods.edu or call 707-476-4160
Canvas Help for students: https://www.redwoods.edu/online/Help-Student
Canvas online orientation workshop: https://www.redwoods.edu/online/Home/Student-Resources/Canvas-Resources

Community College Student Health and Wellness

Resources, tools, and trainings regarding health, mental health, wellness, basic needs and more designed for California community college students, faculty and staff are available on the California Community Colleges Health & Wellness website.

Wellness Central is a free online health and wellness resource that is available 24/7 in your space at your pace.

Students seeking to request a counseling appointment for academic advising or general counseling can email counseling@redwoods.edu.

Emergency procedures / Everbridge

College of the Redwoods has implemented an emergency alert system called Everbridge. In the event of an emergency on campus you will receive an alert through your personal email and/or phones. Registration is not necessary in order to receive emergency alerts. Check to make sure your contact information is up-to-date by logging into WebAdvisor https://webadvisor.redwoods.edu and selecting 'Students' then 'Academic Profile' then 'Current Information Update.'

Please contact Public Safety at 707-476-4112 or security@redwoods.edu if you have any questions. For more information see the Redwoods Public Safety Page.

In an emergency that requires an evacuation of the building anywhere in the District:

- Be aware of all marked exits from your area and building
- Once outside, move to the nearest evacuation point outside your building

- Keep streets and walkways clear for emergency vehicles and personnel

Do not leave campus, unless it has been deemed safe by the campus authorities.

Eureka Campus Emergency Procedures

Please review the campus emergency map for evacuation sites, including the closest site to this classroom (posted by the exit of each room). For more information on Public Safety go to the Redwoods Public Safety Page It is the responsibility of College of the Redwoods to protect life and property from the effects of emergency situations within its own jurisdiction.

In the event of an emergency:

1. Evaluate the impact the emergency has on your activity/operation and take appropriate action.
2. Dial 911, to notify local agency support such as law enforcement or fire services.
3. Notify Public Safety 707-476-4111 and inform them of the situation, with as much relevant information as possible.
4. Public Safety shall relay threat information, warnings, and alerts through the Everbridge emergency alert system, Public address system, and when possible, updates on the college website, to ensure the school community is notified.
5. Follow established procedures for the specific emergency as outlined in the College of the Redwoods Emergency Procedure Booklet, (evacuation to a safe zone, shelter in place, lockdown, assist others if possible, cooperate with First Responders, etc.).
6. If safe to do so, notify key administrators, departments, and personnel.
7. Do not leave campus, unless it is necessary to preserve life and/or has been deemed safe by the person in command.

Student Support Services

The following online resources are available to support your success as a student:

- CR-Online (Comprehensive information for online students)
- Library Articles & Databases
- Canvas help and tutorials
- Online Student Handbook

Counseling offers assistance to students in need of professional counseling services such as crisis counseling.

Learning Resource Center includes the following resources for students

- Academic Support Center for instructional support, tutoring, learning resources, and proctored exams. Includes the Math Lab & Drop-in Writing Center
- Library Services to promote information literacy and provide organized information resources.
- Multicultural & Diversity Center

Special programs are also available for eligible students include

- Extended Opportunity Programs & Services (EOPS) provides financial assistance, support and encouragement for eligible income disadvantaged students at all CR locations.
- The TRiO Student Success Program provides eligible students with a variety of services including trips to 4-year universities, career assessments, and peer mentoring. Students can apply for the program in Eureka or in Del Norte
- The Veteran's Resource Center supports and facilitates academic success for Active Duty Military, Veterans and Dependents attending CR through relational advising, mentorship, transitional assistance, and coordination of military and Veteran-specific resources.

Tips for Students

ASE-Certified Master Technicians were surveyed for their advice to students who want to become automotive service professional. Although the survey was especially for students, the tips that were suggested are applicable to all automotive technicians, from the newest to the most experienced. The following is a compilation of the responses:

1 Education, Education, Education – Continue your education and develop strong math, reading, study skills and computer skills. **A strong background in electronics is essential**.
2 Take advantage of on-the-job training, apprenticeship opportunities – Get all the training you can and start in a work environment that caters to service and excellence.
3 Keep abreast of new technology – Make a commitment to life-long learning. There is a constant change in technology so take advantage of additional training whenever it is available.
4 Learn a systems approach – Vehicles today are complex, so it is necessary to understand the interaction of electrical and mechanical components within the total system. Learn how to understand the whole system and you can apply this knowledge across the spectrum of vehicles.
5 Develop good communication skills – learn not only the professional and technical skills but also communication and people skills. Your credibility is linked to your perceived competence.
6 Keep a positive attitude – Develop a positive outlook so that you perform proper repairs. Apply yourself – you get exactly as much out of your job as you put into it.
7 Take pride in your work – Work on every car as if it were your own. Whatever you do – do it well, it's your signature.
8 Be honest and ethical – Stay focused on what is most important, practice good work ethics, be dependable and honest, and fix it right the first time.
9 Cultivate professionalism in yourself and others – Act professionally, take pride in your appearance as well as in the shop area. Be a positive role model for others. Show up for work every day and always be on time.
10 Become ASE certified – Certification gives you an edge when you are seeking employment. Your confidence, sense of self-worth, and ability to get a job almost anywhere are improved once you become certified. ASE certification shows your employer that you have proven your technical expertise and that you are among the group of the very best technicians.

Learning Outcomes

The college strives for continual improvement in instruction through assessment of learning outcomes. These outcomes are assessed in various ways throughout the course and upon completion of the program. Please participate to the fullest of your ability in this effort to make this course and this program successful.

Program Learning Outcomes

1. Perform common service and repair tasks identified by the National Automotive Technicians Education Foundation (NATEF)/ Automotive Service Excellence (ASE).
2. Locate industry-standard diagnostic information to localize complex automotive problems.
3. Successfully perform the entry level skills and tasks required for service and repair of

automotive systems.

Course Objectives

Upon successful completion of this course the student should be able to perform the following tasks:

I. ENGINE REPAIR
A. General

1. Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1

2. Verify operation of the instrument panel engine warning indicators. P-1

3. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action. P-1

4. Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert. P-1

5. Identify service precautions related to service of the internal combustion engine of a hybrid vehicle. P-2

I. ENGINE REPAIR
B. Cylinder Head and Valve Train

1. Identify components of the cylinder head and valve train. P-1

I. ENGINE REPAIR
C. Lubrication and Cooling Systems

1. Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, and galley plugs; determine necessary action. P-1

2. Inspect, replace, and/or adjust drive belts, tensioner, and pulleys; check pulley and belt alignment. P-1

3. Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required. P-1

4. Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as required. P-1

5. Identify components of the lubrication and cooling systems. P-1

I. AUTOMATIC TRANSMISSION AND TRANSAXLE
A. General

1. Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1

2. Check fluid level in a transmission or a transaxle equipped with a dip-stick. P-1

3. Check fluid level in a transmission or a transaxle not equipped with a dip-stick. P-1

4. Check transmission fluid condition; check for leaks. P-2

5. Identify drive train components and configuration. P-1

II. AUTOMATIC TRANSMISSION AND TRANSAXLE
A. In-Vehicle Transmission/Transaxle

1. Inspect for leakage at external seals, gaskets, and bushings. P-1

2. Inspect, replace and/or align power train mounts. P-2

3. Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification. P-1

III. MANUAL DRIVE TRAIN AND AXLES
A. General

1. Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1

2. Drain and refill manual transmission/transaxle and final drive unit; use proper fluid type per manufacturer specification. P-1

3. Check fluid condition; check for leaks. P-2

4. Identify manual drive train and axle components and configuration. P-1

III. MANUAL DRIVE TRAIN AND AXLES
B. Clutch

1. Check and adjust clutch master cylinder fluid level; use proper fluid type per manufacturer specification P-1

2. Check for hydraulic system leaks. P-1

III. MANUAL DRIVE TRAIN AND AXLES
D.
1. Check for leaks at drive assembly and transfer case seals; check vents; check fluid level; use proper fluid type per manufacturer specification. P-2

III. MANUAL DRIVE TRAIN AND AXLES
E. Differential Case Assembly

1. Clean and inspect differential case; check for leaks; inspect housing vent. P-1

2. Check and adjust differential case fluid level; use proper fluid type per manufacturer specification. P-1

3. Drain and refill differential housing. P-1

4. Inspect and replace drive axle wheel studs. P-1

IV. SUSPENSION AND STEERING SYSTEMS
A. General

1. Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1

2. Identify suspension and steering system components and configurations. P-1

IV. SUSPENSION AND STEERING
B. Related Suspension and Steering Service

1. Inspect power steering fluid level and condition. P-1

2. Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification. P-2

3. Inspect for power steering fluid leakage. P-1

4. Inspect tie rod ends (sockets), tie rod sleeves, and clamps. P-1

5. Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings. P-1

6. Identify hybrid vehicle power steering system electrical circuits and safety precautions. P-2

IV. SUSPENSION AND STEERING
D. Wheels and Tires

1. Inspect tire condition; identify tire wear patterns; check for correct tire size, application (load and speed ratings), and air pressure as listed on the tire information placard/label. P-1

2. Rotate tires according to manufacturers' recommendations including vehicles equipped with tire pressure monitoring systems (TPMS). P-1

3. Inspect tire and wheel assembly for air loss; determine necessary action. P-1

I. BRAKES
A. General

1. Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1

2. Install wheel and torque lug nuts. P-1

3. Identify brake system components and configuration. P-1

V. BRAKES
B. Hydraulic System

1. Check master cylinder for external leaks and proper operation. P-1

2. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports. P-1

3. Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification. P-1

4. Identify components of hydraulic brake warning light system. P-3

5. Bleed and/or flush brake system. P-1

6. Test brake fluid for contamination. P-1

V. BRAKES
A. Disc Brakes

1. Check brake pad wear indicator; determine necessary action. P-1

BRAKES
C. Power-Assist Units

1. Check brake pedal travel with, and without, engine running to verify proper power booster operation. P-2

2. Identify components of the brake power assist system (vacuum and hydraulic); check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster. P-1

BRAKES
D. Related Systems (i.e., Wheel Bearings, Parking Brakes, Electrical)

1. Check parking brake operation and parking brake indicator light system operation; determine necessary action. P-1

2. Check operation of brake stop light system. P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS
A. General

1. Research vehicle service information including vehicle service history, service precautions, and technical service bulletins. P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS
A. Battery Service

1. Perform battery state-of-charge test; determine necessary action. P-1

2. Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs. P-1

3. Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply. P-1

4. Identify safety precautions for high voltage systems on electric, hybrid-electric, and diesel vehicles. P-2

5. Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures. P-2

VI. ELECTRICAL/ELECTRONIC SYSTEMS
B. Starting System

1. Remove and install starter in a vehicle. P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS
D. Charging System

1. Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment. P-1

2. Remove, inspect, and/or replace generator (alternator). P-2

VI. ELECTRICAL/ELECTRONIC SYSTEMS
E. Lighting, Instrument Cluster, Driver Information, and Body Electrical Systems

1. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/ driving lights); replace as needed. P-1

2. Aim headlights. P-2

3. Identify system voltage and safety precautions associated with high-intensity discharge headlights. P-2

4. Disable and enable supplemental restraint system (SRS); verify indicator lamp operation. P-1

5. Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators. P-1
6. Verify windshield wiper and washer operation; replace wiper blades. P-1

VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)
A. General

1. Research vehicle service information, including refrigerant/oil type, vehicle service history, service precautions, and technical service bulletins. P-1

2. Identify heating, ventilation and air conditioning (HVAC) components and configuration. P-1

VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)
B. Refrigeration System Components

1. Inspect and replace A/C compressor drive belts, pulleys, and tensioners; visually inspect A/C components for signs of leaks; determine necessary action. P-1

2. Identify hybrid vehicle A/C system electrical circuits and the service/safety precautions. P-2

3. Inspect A/C condenser for airflow restrictions; determine necessary action. P-1

VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)
C. Heating, Ventilation, and Engine Cooling Systems

1. Inspect engine cooling and heater systems hoses and pipes; determine necessary action. P-1

VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)
D. Operating Systems and Related Controls

1. Inspect A/C-heater ducts, doors, hoses, cabin filters, and outlets; determine necessary action. P-1
2. Identify the source of A/C system odors. P-2 8

VIII. ENGINE PERFORMANCE
A. General

1. Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1

2. Remove and replace spark plugs; inspect secondary ignition components for wear and damage. P-1

VIII. ENGINE PERFORMANCE
B. Fuel, Air Induction, and Exhaust Systems

1. Replace fuel filter(s) where applicable. P-2

2. Inspect, service, or replace air filters, filter housings, and intake duct work. P-1

3. Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; determine necessary action. P-1

4. Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine necessary action. P-1

5. Check and refill diesel exhaust fluid (DEF). P-2

VIII. ENGINE PERFORMANCE
A. Emissions Control Systems

1. Inspect, test, and service positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform necessary action. P-2

IX. WORKPLACE SUCCESS SKILLS

1. Students will practice professionalism, effective communication and teamwork, punctuality, and safety procedures as would be expected in industry.

Evaluation & Grading Policy

Theory Portion		
Test I	Maintenance and Engines Service	50 points
Test II	Electrical Principles & Service	50 points
Test III	Brake Systems	50 points
Test IV	Steering & Suspension	50 points
Test V	Drivetrain & HVAC	40 points
Homework & Classroom Assignments		120 points
Comprehensive Final Exam		140 points
Total points possible in the classroom portion		500 points

Extra Credit

Each student may arrange with instructor to read and report on a topic related to AT 10 Introduction to Automotive Technology from a source other than the course text or the internet

i.e. trade publications, library reference material, magazines, newspaper articles, etc... The report must be no less than one page typed and no longer than three pages. You must properly cite your references on a separate page. You may earn up to 50 points per report and you may turn in a maximum of 1 report per semester. Please inform the instructor and agree on a topic prior to doing this assignment.

Laboratory Portion

Vehicle Maintenance	75 points
Engine Service	75 points
Electrical Service	75 points
Brake Systems	75 points
Steering Suspension	75 points
Drivetrain/Transmission	75 points
Heating and Cooling	75 points
Total points possible in the lab portion	500 points

Course Calendar

Date	*Theory*	*Lab*	*Assigned Reading*
8-24	*Overview*	*Shop Safety*	*Ch. 2*
8-26	*Shop Basics*	*Using Equipment*	*Ch. 3 & 4*
8-31	*Engine Principles*	*Engine Inspections*	*Ch. 22 & 23*
9-2	*Engine Principles*	*Engine Inspections*	*Ch. 22 & 23*
9-7	*Engine Service*	*Engine Testing*	*Ch. 24*
9-9	***Test I***	***Engines***	
9-14	*Electrical Principles*	*ConsuLab/DMM*	*Ch. 17*
9-16	*Electronic Service*	*Battery Service & Test*	*Ch. 18*
9-21	*Starting & Charging*	*Charging Lab*	*Ch. 19*
9-23	*Staring & Charging*	*Starting Lab*	*Ch. 20*
9-28	*Lighting & Electrical*	*Lighting Systems*	*Ch. 21*
9-30	***Test II***	***Electrical Principles & Service***	
10-5	*Brake Principles*	*Brake Inspections*	*Ch. 10 & 11*
10-7	*Drum Brakes*	*Drum Brakes*	*Ch. 12 & 13*
10-12	*Disk Brakes*	*Disk Brakes*	*Ch. 14 & 15*
10-14	*ABS, ESC*	*Parking Brakes, Warning Lights*	*Ch. 16*
10-19	***Test III***	***Brake Systems***	
10-21	*Wheels and Tires*	*Bearing & Tires*	*Ch. 5*
10-26	*Suspension Systems*	*Suspension Inspections*	*Ch. 6 & 7*
10-28	*Steering System*	*Steering Inspections*	*Ch. 8 & 9*
11-2	*Dash Lights/Warning Lights*	*Scan Tool Basics TPMS*	
11-4	***Test IV***	***Steering & Suspension***	
11-9	*Drive Trains*	*Drive Train Inspections*	*Ch. 25*
11-11	***No Class!!!***	***No Class !!!***	
11-16	*Transmissions*	*Transmission Inspections*	*Ch. 25*
11-18	*HVAC System*	*HVAC Service*	*Ch. 26*
11-23	***Fall Break!!!***	***No Class!!!***	
11-25	***Fall Break!!!***	***No Class!!!***	
11-30	*Scan Tools*	*Scan Tool*	
12-2	***Test V***	***Drive Train***	
12-7	*Vehicle Maintenance*	*Vehicle Inspections*	*Ch. 27*
12-9	***Vehicle Maintenance Test***	***Individual Vehicle Inspections***	
12-14	***Final Exam***	***8:30 – 10:30 AM***	