

Syllabus for AT-21 Engine Repair

Course Information

- Semester and Year: Fall 2025
- Course ID and Section number: AT-21-E9067
- Instructor's name: Ernest Shull
- Day and time of required meetings: Monday, Wednesday, 1:15 PM 5:45 PM
- Location: AT-128
- Course units: 4

Instructor Contact Information

- Office location or Online AT-122
- Office hours: Open Door Policy
- Phone number: 707-476-4221
- Email address: ernest-shull@redwoods.edu

Required Materials

Safety Glasses ANSI Z87.1+

Catalog Description

- A course covering four stroke cycle theory, engine torque, horsepower, materials, and manufacturing processes as they relate to internal combustion power plants used in production automobiles and light trucks. The theory, principles, and diagnosis of cooling systems, lubrication systems, and common engine mechanical failures will be emphasized. The laboratory portion of the course will focus on comprehensive engine testing, in-vehicle engine servicing, and introduction to the diagnosis of engine controls, ignition, and fuel and emission systems. The course is designed in conjunction with Automotive Service Excellence (ASE) Education Foundation standards and will prepare the student for the ASE Certification Examination.

Course Student Learning Outcomes

- Diagnose and repair cylinder head and valve timing
- Diagnose and repair lubrication and cooling system
- Diagnose and repair engine performance systems.

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 may be dropped from this class by the instructor. There may be situations where this will occur due to unforeseen circumstances. Please contact me so we can discuss your attendance and possible makeup work.**

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.

Evaluation & Grading Policy

Course Evaluation

- **Course Points**
- All Labs will contribute 50% towards your final grade. Labs are graded at 20 points per lab. 10 Points towards participation and 10 points towards Repair Orders. Please fill out your repair orders as neat and complete as possible. Some labs will be worth more points if they are a multi-day lab.
- Tests and Homework will contribute towards the other 50% with 10% towards Homework and 40% toward Tests. Homework will usually be completed as a group after the lecture, however due to certain time constraints it may have to be completed after class.
- Your final grade will be based on your grade in Canvas however I will also take into consideration attendance and attitude in the shop when considering your final posted grade. If you ever have any questions about this, feel free to contact me.
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Extra Credit - Each student may elect independently to read and report on a topic related to this course from a source other than the course text i.e. recognized 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 typed. 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 of your topic prior to doing this assignment.

Educational Accessibility and Support

College of the Redwoods is committed to providing reasonable accommodations for qualified students

who could benefit from additional educational support and services. You may qualify if you have a physical, mental, sensory, or intellectual condition which causes you to struggle academically, including but not limited to:

- Mental health conditions such as depression, anxiety, PTSD, or bipolar disorder
- Common ailments such as arthritis, asthma, diabetes, autoimmune disorders, and diseases
- Temporary impairments such as a broken bone, recovery from significant surgery, or a pregnancy-related disability
- Neurodevelopmental disorders such as a learning disability, intellectual disability, autism, acquired brain injury, or ADHD
- Vision, hearing, or mobility conditions

Available services include extended test time, quiet testing environments, academic assistance and tutoring through the [LIGHT Center](#), counseling and advising, alternate formats of course materials (e.g., audio books, braille, E-texts), assistive technology, learning disability assessments, approval for personal attendants, interpreters, priority registration, on-campus transportation, adaptive physical education and living skills courses, and more. If you believe you might benefit from disability- or health-related services and accommodations, please contact [Student Accessibility Support Services \(SASS\)](#). If you are unsure whether you qualify, please contact Student Accessibility Support Services (SASS) for a consultation: sass@redwoods.edu.

SASS office locations and phone numbers

Eureka campus

- Phone: 707-476-4280
- Location: Learning Resource Center (Library)

Del Norte campus

- Phone: 707-465-2353
- Location: main building, near the Library

Klamath-Trinity campus

- Phone: 707-476-4280

Course Schedule

<i>Day</i>	<i>Theory</i>	<i>Lab</i>	<i>Assigned Reading</i>
8-25	Safety	Overview	None
8-27	Tools and Measuring	Tool Use/Measurements	3,4
9-1	LABOR DAY	NO CLASS	
9-3	Engine Fundamentals	PICO & VACUUM TEST	5,6
9-8	Engine Fundamentals	Compression Tests	5,6
9-10	TEST I	Engine Mechanical	
9-15	Cooling Systems	Diagnosis and Service	8
9-17	Cooling Systems	R&R Components	9
9-22	Cooling Systems	R&R Components	9
9-24	Lubrication Systems	Oil Changes & Service	7
9-29	Lubrication Systems	Oil Pressure Tests	7
10-1	Lubrication Systems	Oil Pressure Switches	7
10-6	TEST II	Cooling & Lubrication	
10-8	Sealing Components	Valve Cover R&R & Timing	22
10-13	Fuel System Theory	Fuel System Tests & DTC's	26
10-15	Ignition System Theory	Coil Pack Testing	
10-20	Engine Removal	Begin Engine Teardown	10
10-22	Engine Disassembly	Remove Cylinder Heads	11
10-27	Timing Chains	Timing Belts	16,18
10-29	Cylinder Head Service	Heads, CAMS, & Valves	15,17
11-3	TEST III		
11-5	Engine Blocks	Begin Block Teardown	12
11-10	Crankshaft and Bearings	Crankshaft measurements	13
11-12	Pistons, Rings, Rods	Pistons R&R	14
11-17	Engine Cleaning & Inspect	Inspect Engine Components	21
11-19	FALL BREAK	FALL BREAK	
11-24	FALL BREAK	FALL BREAK	
11-26	Engine Assembly	Engine Assembly	24
12-1	Engine Installation	Engine Assembly	25
12-3	Test IV Review	Finish Engine Assembly	
12-8	TEST IV		
12-10	MAKE UP DAY	MAKE UP DAY	
12-15	FINAL EXAM	1:00PM – 3:00PM	