



Syllabus for AT-16 Automotive Electrical Systems

Course Information

Semester & Year: Spring Semester 2022

Course ID & Section #: AT-16-E3032

Instructor's name: Ernest Shull

Day/Time of required meetings: Tuesday, Thursday 01:15PM - 05:35PM

Location: AT-128

Course units: 4

Instructor Contact Information

Office location: AT-129A

Office hours: Monday, Wednesday 12:00PM – 1:00PM

Phone number: 707-476-4221

Email address: Ernest-Shull@redwoods.edu

Catalog Description

A course covering theory and principles of automotive electrical systems. The course includes basic electrical theory, Ohm's Law, series and parallel circuits, electrical symbols and schematics, automotive batteries, charging systems, voltage regulation, starting systems, lighting systems, and various accessories. The laboratory portion of the course will place emphasis on diagnosis and testing techniques required to effectively determine the necessary action in an electrical system failure. The use of schematics, technical specifications, voltmeters, ohmmeters, ammeters, and circuit testers will be required. The course is designed in conjunction with Automotive Service Excellence (ASE) Education Foundation standards and subsequently will in part prepare the student for the ASE Electrical / Electronic Certification Examination.

Course Student Learning Outcomes

1. Diagnose general electrical system problems.
2. Diagnosis and service of battery and charging systems.
3. Diagnose and repair starting system.

Prerequisites/co-requisites/ recommended preparation

none

Accessibility

College of the Redwoods is 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
- Del Norte: 707-465-2324, main building near library
- Klamath-Trinity: 530-625-4821 Ext 103

If you are taking online classes DSPS will email approved accommodations for distance education classes to your instructor. In the case of face-to-face instruction, please present your written accommodation request to your instructor at least one week before the needed accommodation so that necessary arrangements can be made. Last minute arrangements or post-test adjustments usually cannot be accommodated.

Student Support

Good information and clear communication about your needs will help you be successful. Please let your instructor know about any specific challenges or technology limitations that might affect your participation in class. College of the Redwoods wants every student to be successful.

Evaluation & Grading Policy

Test I Basic Electrical Theory 70 points
Test II Battery Theory 70 points
Test III Charging Theory 70 points
Test IV Starting Theory 70 points
Test V Accessory Theory 70 points
Quizzes/Homework 50 points
Final Exam Comprehensive 100 points
Total Possible Online Work Points 500 points

Extra Credit

Each student may elect independently to read and report on a topic related to automotive electrical systems 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. Prior to doing this assignment, please get the instructor's approval of your topic.

Laboratory/Shop Portion

Basic electrical testing 100 points
Battery testing 100 points
Charging system testing 100 points
Starting system testing 100 points
Accessory testing 100 points
Total Possible Shop Points 500 points

Admissions deadlines & enrollment policies

Spring 2022 Dates

- *Classes begin: 01/15/22*
- *Last day to add a class: 01/21/22*
- *Martin Luther King, Jr's Birthday (all campuses closed: 01/17/22*
- *Last day to drop without a W and receive a refund: 01/28/22*

- *Census date (or 20% into class duration): 01/31/22*
- *Last Day to file P/NP (only courses where this is an option) 02/11/22*
- *Lincoln's Birthday (all campuses closed): 02/18/22*
- *Presidents Day (all campuses closed): 02/21/22*
- *Last day to petition to graduate or apply for certificate: 03/03/22*
- *Spring Break (no classes): 03/14/22-03/19/22*
- *Last day for student-initiated W (no refund): 04/01/22*
- *Last day for faculty-initiated W (no refund): 04/01/22*
- *Final examinations: 05/07/22-05/13/22*
- *Semester ends: 05/13/22*
- *Grades available for transcript release: approximately 05/30/22*

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://webapps.redwoods.edu/tutorial/>

Canvas online orientation workshop: [Canvas Student Orientation Course \(instructure.com\)](https://webapps.redwoods.edu/tutorial/)

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 emergencies 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.

Course Schedule

<i>Day</i>	<i>Theory</i>	<i>Lab</i>	<i>Assigned Reading</i>
1/18	<i>Overview & Safety</i>	<i>Shop Walkthrough</i>	<i>CH. 2 & CH. 3</i>
1/20	<i>Electrical Fundamentals</i>	<i>Identify Electrical Components</i>	<i>CH. 4 & CH. 5</i>
1/25	<i>Series Circuits</i>	<i>Building Circuits</i>	<i>CH. 6 & CH. 9</i>
1/27	<i>Parallel Circuits</i>	<i>Building Circuits</i>	<i>CH. 7</i>
2/1	<i>Series-Parallel Circuits</i>	<i>Building Circuits</i>	<i>CH. 8</i>
2/3	<i>Automotive Wiring</i>	<i>Wire Repair & Circuits</i>	<i>CH. 11 & CH. 12</i>
2/8	TEST I Basic Electrical	Lab Evaluation – Circuits	
2/10	<i>Batteries</i>	<i>Battery Testing</i>	<i>CH. 18</i>
2/15	<i>Batteries</i>	<i>Battery Testing</i>	<i>CH. 19</i>
2/17	<i>Batteries</i>	<i>Battery Testing</i>	<i>CH. 19</i>
2/22	TEST II Batteries	Lab Evaluation - Batteries	
2/24	<i>Cranking Systems</i>	<i>Bench Testing</i>	<i>CH. 20</i>
3/1	<i>Cranking Systems</i>	<i>Starter Control Circuit</i>	<i>CH. 21</i>
3/3	<i>Cranking Systems</i>	<i>Starter Testing & R&R</i>	
3/8	<i>Cranking Systems</i>	<i>Starter Diagnostics</i>	
3/10	TEST III	Lab Evaluation – Cranking	
3/15	No Class	Spring Break	
3/17	No Class	Spring Break	
3/22	<i>Charging Systems</i>	<i>Bench Testing</i>	<i>CH. 22</i>
3/24	<i>Charging Systems</i>	<i>Charging System Testing</i>	<i>CH. 23</i>
3/29	<i>Charging Systems</i>	<i>R&R with Diagnostics</i>	
3/31	<i>Charging Systems</i>	<i>Charging Review</i>	
4/5	TEST IV	Lab Evaluation - Charging	
4/7	<i>Horn Systems</i>	<i>Horn Testing</i>	<i>CH. 28</i>
4/12	<i>Wiper Systems</i>	<i>Wiper Testing</i>	<i>CH. 28</i>
4/14	<i>Lighting Systems</i>	<i>Lighting System Testing</i>	<i>CH. 24</i>
4/19	<i>Lighting Systems</i>	<i>Lighting System Testing</i>	<i>CH. 24</i>
4/21	<i>Electrical Review</i>	<i>Lighting Diagnostics</i>	
4/26	TEST V	Electrical Accessories	
4/28	Final Review	Lab Finals	
5/3	Final Review	Lab Finals	
5/5	Final Review	Lab Finals	
5/12	Final Exam	1:00PM – 3:00PM	