

AT-16 Electrical Systems Syllabus

Course Information

Semester & Year: Fall 2024

Course ID and Section number: AT-16-E7421

Instructor's name: Anibal Florez

Day and time of required meetings: Mondays and Wednesdays form 8:15am to 12.35pm

Location: Lecture in AT-128 followed by lab in AT-129

Number of proctored exams: 5 plus the final exam

Course units: 4

Instructor Contact Information

Office location: AT-141

Office hours: By appointment or stop by anytime

Phone number: 707-476-4373

Email address: Anibal-Florez@redwoods.edu

Communication notes: If I don't reply or call you back within 48 hours (about 2 days) please try again.

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

- Diagnose general electrical system problems.
- Diagnosis and service of battery and charging systems.
- Diagnose and repair starting system.

Required Materials

Textbook title: Automotive Electricity and Electronics

Edition: 6th Edition

Author: James Halderman

ISBN: 13: 978-0-13-76442-8

Other requirement: ANSI Z87.1 approved safety glasses and closed toed shoes.

Prerequisites/corequisites/ recommended preparation

None.

Educational Accessibility & 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, bipolar disorder, and ADHD
- 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
- A learning disability (such as dyslexia, reading comprehension), intellectual disability, autism, or acquired brain injury
- Vision, hearing, or mobility challenges

Available services include extended test time, quiet testing environments, tutoring, counseling and advising, alternate formats of materials (such as audio books or E-texts), assistive technology, on-campus transportation, and more. If you believe you might benefit from disability- or health-related services and accommodations, please contact [Disability Services and Programs for Students \(DSPS\)](#). If you are unsure whether you qualify, please contact DSPS for a consultation: dsp@redwoods.edu.

DSPS office locations and phone numbers

Eureka campus

- Phone: 707-476-4280
- Location: Student Services Building, first floor

Del Norte campus

- Phone: 707-465-2324
- Location: Main Building, next to the library

Klamath-Trinity campus

- Phone: 707-476-4280

Student Support Services

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.

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

[CR Online Learning Support](#)

Tech support, laptop loans, guides to using Canvas, installing Office 365 for free, and more.

[Library Articles & Databases](#)

Find the best library databases for your research.

[Online Tutoring Resources](#)

Participate in tutoring over Zoom.

To learn more about the resources available to you, click on a title bar below, or click the down arrow to expand them all.

Klamath-Trinity students can contact the CR Klamath-Trinity Office for specific information about student support services at 530-625-4821.

Community College Student Health and Wellness

[National Suicide Prevention Lifeline](#)

If you are in distress or are with someone at risk right now, call or text the National Suicide Prevention Lifeline.

Call the National Suicide Prevention Lifeline

1-800-273-TALK (8255)

Text the National Suicide Prevention Lifeline

741-741

[Timely Care](#)

When you're not feeling well physically or distressed mentally, Timely Care can offer the help you're looking for in just a few quick taps. Students can schedule an appointment anytime via phone, video, and chat. [Log in or set up an account with Timely Care.](#)

[Mental Health Counseling](#)

Students should text, email, or fax Shawna Bell directly for scheduling and/or services.

- Text: 707-496-2856
- Email: shawnabmft@gmail.com
- Fax and voicemail: 707-237-2318

[Wellness Central](#)

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 [Wellness Central](#).

Counseling

[Counseling and Advising](#) can assist students in need of academic advising and professional counseling services. Call, email or stop by one of our offices to make an appointment!

Counseling and Advising office locations and contact info

Eureka campus

- Phone: 707-476-4150
- Location: Student Services Building, first floor
- Email: counseling@redwood.edu
- Hours: Monday through Friday, 9am to 4pm. Summer hours may vary

Del Norte campus

- Phone: 707-476-2300
- Location: Main Building, next to the library
- Hours: Summer hours may vary

Klamath-Trinity campus

- Phone: 530-625-4821
- Email: KT-staff@redwoods.edu
- Hours: Summer hours may vary

Basic Needs Center

[The Basic Needs Center](#) provides for the health and safety of students by providing access to healthy food, financial resources, and referrals to safe and secure housing. [Submit a request for services and information](#).

Basic Needs Center contact info

- Phone: 707-476-4153
- Email: the-grove@redwoods.edu

Learning Resource Center

The Learning Resource Center includes the following resources for students:

Library Services

[Library Services](#) promotes information literacy and provides organized information resources.

Multicultural and Equity Center (MCE)

The [Multicultural and Equity Center](#) is a dynamic and inclusive place that supports all students in their academic and personal journeys at the college. We do this by creating community, home away from home, and a safe place for cultural expression, cross-cultural learning, access to college and dignity resources, and social justice work opportunities. The MEC is committed to retention and student success by offering activities related to leadership development, student

connectedness and student equity. We are a student-centered program that fosters respect for all people.

Academic Support Center

The [Academic Support Center](#) offers tutoring and test proctoring for CR students.

Student Tech Help

[Student Tech Help](#) provides students with assistance around a variety of tech problems.

Extended Opportunity Programs and Services (EOPS)

[Extended Opportunity Programs and Services](#) (EOPS) provides services to eligible income disadvantaged students including: textbook awards, grants, career academic and personal counseling, transportation assistance, tutoring, laptop, calculator and textbook loans, priority registration, graduation cap and gown, workshops, and more!

TRiO Student Success Program

The TRiO Student Support Services Program provides eligible students with a variety of services including academic advising, career assessments, assistance with transfer, and peer mentoring. Students can apply for the program with the [Eureka TRiO office](#) or the [Del Norte TRiO office](#).

Veterans Resource Center

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.

CalWORKS

California Work Opportunity & Responsibility to Kids ([CalWORKs](#)) provides supportive services to student parents with children under the age of 18, who are receiving cash assistance (TANF benefits), to become self-sufficient. Services include: transportation assistance, basic student supplies, tutoring, priority registration, laptop and calculator loans, career, academic, and personal counseling, and more!

Fall 2024 Dates to remember

| Date | To Remember |
|-------------|---|
| August 23 | Last day to register for classes (day before the first class meeting) |
| August 24 | Classes begin |
| August 30 | Last day to add a class |
| September 2 | Labor Day Holiday (district wide closure) |
| September 6 | Last Day to Drop & Receive a Refund |

| Date | To Remember |
|----------------|---|
| September 8 | Last Day to Drop w/out a "W" |
| September 9 | Census Date (20% of class) |
| October 31 | Last Day to Petition to Graduate & Petition for Certificate |
| November 1 | Last Day for Student/Faculty Withdrawal |
| November 11 | Veteran's Day Holiday (District Wide Closure) |
| November 25-26 | Fall Break (No Classes) |
| November 27-29 | Thanksgiving Holiday (District Wide Closure) |
| December 14-20 | Final Examinations |
| December 20 | Last Day to File P/NP Option |
| December 20 | Semester Ends |
| December 27 | Grades Due |
| January 3 | Grades Available for Transcript Release |

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 [2023-2024 College Catalog](#) and [CR Board and Administrative Policies](#).

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. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the [2023-2024 College Catalog](#) and [CR Board and Administrative Policies](#).

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.

Canvas Information

- Log into Canvas at [My CR Portal](#)
- For help logging in to Canvas and general tech help, visit [Student Technical Support](#)
- Once you're logged in to Canvas, you click on the Help icon on the left menu
- Canvas online orientation workshop: [Canvas Student Orientation Course](#)

Setting Your Preferred Name and Pronouns in Canvas

Students have the ability to display personal pronouns and an alternate first name in Canvas. Students may change their pronouns on their own in Canvas (Account :: Settings :: Edit Settings). To request a change to your preferred list name, contact [Admissions & Records](#). Your Preferred Name will only be listed in Canvas; this does not change your legal name in our records. See the [Student Information Update Form \(pdf\)](#).

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](#) 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 visit [Redwoods Public Safety](#).

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.

Evaluation & Grading Policy

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-, A
899 - 800 = B-, B, B+
799 - 700 = C, C+

699 - 600 = D

599 - 500 = F

Course Schedule

This course is scheduled to meet Monday and Wednesday 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. If you're not present for lecture you are absent, even if you make it to lab!

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.**

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.

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 try to 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. 15 minutes early is 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 familiar with the following tasks:

VI. ELECTRICAL/ELECTRONIC SYSTEMS

A. General

1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including vehicles equipped with advanced driver assistance systems (ADAS).
P-1
2. Identify electrical/electronic system components and configurations.
P-1
3. Retrieve and record DTCs, OBD monitor status, and freeze frame data; clear codes and data when directed.
P-1
4. Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).
P-1
5. Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop

(including grounds), current flow and resistance.

P-1

6. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.

P-1

7. Describe types of test lights; use appropriate test light to check operation of electrical circuits per service information.

P-1

8. Use fused jumper wires to check operation of electrical circuits per service information.

P-1

9. Use wiring diagrams during the diagnosis of electrical/electronic circuit problems.

P-1

10. Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action.

P-1

11. Inspect and test fusible links, circuit breakers, and fuses; determine needed action.

P-1

12. Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.

P-1

13. Test and measure circuit using an oscilloscope and/or graphing multimeter (GMM); interpret results; determine needed action.

P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS

B. Batteries (Conventional 12-volt)

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

P-1

2. Confirm proper battery capacity, size, type, and application for vehicle; perform battery capacity and load test; determine needed action.

P-1

3. Maintain or restore electronic memory functions as recommended by manufacturer.

P-2

4. Inspect and clean battery; fill battery cells (if applicable); check battery cables, connectors, clamps, and hold-downs.

P-1

5. Perform battery charging according to manufacturer's recommendations.

P-1

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

P-1

7. Identify electrical/electronic modules, security systems, radios, and other accessories that require re-initialization or code entry after reconnecting vehicle battery.

P-2

VI. ELECTRICAL/ELECTRONIC SYSTEMS

C. Starting System

1. Perform starter current draw test; determine needed action.

P-1

2. Perform starter circuit voltage drop tests; determine needed action.

P-1

3. Inspect and test starter relays and solenoids; determine needed action.

P-2

4. Remove and install starter in a vehicle.

P-1

5. Inspect and test switches, connectors, and wires of starter control circuits; determine needed action.

P-1

6. Demonstrate knowledge of an automatic idle-stop/start-stop system.

P-1

7. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.

P-1

8. Diagnose a no-crank condition using a wiring diagram and test equipment; determine needed action.

P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS

D. Charging System

1. Perform charging system output test; determine needed action.

P-1

2. Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment; determine needed action.

P-1

3. Remove, inspect, and/or replace generator (alternator); determine needed action.

P-1

4. Perform charging circuit voltage drop tests; determine needed action.

P-1

5. Diagnose charging system for causes of undercharge, no-charge, or overcharge conditions; determine needed action.

P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS

E. Lighting Systems

1. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); determine needed action.

P-1

2. Aim headlights.

P-2

3. Diagnose the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action.

P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS

F. Instrument Cluster and Driver Information Systems

1. Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators as required.

P-1

2. Inspect and test gauges and gauge sending units for causes of abnormal readings; determine needed action.
P-1
3. Diagnose the causes of incorrect operation of warning devices and other driver information systems; determine needed action.
P-1

VI. ELECTRICAL/ELECTRONIC SYSTEMS

G. Body Electrical Systems

1. Diagnose vehicle comfort, convenience, access, safety, and related systems operation; determine needed action
P-2
2. Remove and reinstall door panel.
P-1
3. Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed action.
P-1
4. Describe disabling and enabling procedures for supplemental restraint system (SRS); verify indicator lamp operation.
P-1
5. Verify windshield wiper and washer operation; replace wiper blades.
P-1
6. Diagnose operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed action.
P-2
7. Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, parking assist, and back-up camera); determine needed action.
P-1
8. Diagnose body electronic systems circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action.
P-1
9. Describe the process for software transfer, software updates, or reprogramming of electronic modules.
P-1

AT 16 Course Grading System

Theory Portion

| | | |
|--------------------------|-------------------------|-------------------|
| Test I | Basic Electrical Theory | 60 points |
| Test II | Battery Theory | 60 points |
| Test III | Charging Theory | 60 points |
| Test IV | Starting Theory | 60 points |
| Test V | Accessory Theory | 60 points |
| Quizzes & Assignments | | 100 points |
| Final Exam Comprehensive | | <u>100 points</u> |
| Total possible Points | | 500 points |

Laboratory Portion

| | |
|----------------------------|------------------|
| Participation and attitude | 50 points |
| Basic electrical testing | 90 points |
| Battery testing | 90 points |
| Charging system testing | 90 points |
| Starting system testing | 90 points |
| Accessory testing | <u>90 points</u> |
| Total possible 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 class per semester. Please inform the instructor of your topic prior to doing this assignment.

Additional options for extra credit through Ford's ACE online learning:

Complete the following learning modules through Ford's ACE learning program and print out the certificate of completion for each section for credit. You'll need to register with the website before you can participate. For more information ask me.

Under the Electrical Systems (STST34) category, and Basic Electrical Theory & Operation (34S11W0) heading, complete any or all of the following for **2 extra credit points each**:

F401001003-01, F401001003-02, F401001003-03, F401001003-04,
F401001003-05, F401001003-06, F401001003-07, F401001003-08, F401001003-09,
F401001003-10, F401001003-11

Additional extra credit options through Subaru University online learning:

Similar to Ford. You will need to create a profile. If you're interested please let your instructor know.

Course Calendar for AT-16

| Date | Theory in Class | Shop Focus | Ch. To Read |
|-------------|----------------------------|-----------------------------|--------------------|
| 8-26 | Shop overview | Shop orientation | Chp. 1, 2, 3 |
| 8-28 | Fund. & ohm's law | Circuit parts & faults | Chp. 4, 5 |
| 9-2 | Holiday | | |
| 9-4 | Series circuits | Building series circuits | Chp. 6 |
| 9-9 | Parallel circuits | Building parallel circuits | Chp. 7 |
| 9-11 | Compound circuits | Building comp. circuits | Chp. 8 |
| 9-16 | Testing circuits | Using the DMM | Chp. 9 |
| 9-18 | Group theory test 1 | Indi-lab evaluations | |
| 9-23 | Vehicle wiring | Diagrams, Wire ID, Repair | Chp. 11, 12 |
| 9-25 | Batteries | Battery ID & service | Chp. 18, 19 |
| 9-30 | Batteries | Battery testing | Chp. 18, 19 |
| 10-2 | Batteries | Battery testing | Chp. 18, 19 |
| 10-7 | Batteries | Battery testing | Chp. 18, 19 |
| 10-9 | Group theory test 2 | Indi-lab evaluations | |
| 10-14 | Electromagnetism | Elec. Mag. Devices | Chp. 14 |
| 10-16 | Charging system | Charging circuit | Chp. 22 |
| 10-21 | Charging system | System diagnosis | Chp. 23 |
| 10-23 | Charging system | System service | Chp. 23 |
| 10-28 | Charging system | System service | Chp. 23 |
| 10-30 | Group theory test 3 | Indi-lab evaluations | |
| 11-4 | Cranking system | Cranking circuit | Chp. 20 |
| 11-6 | Cranking system | Circuit diagnosis | Chp. 21 |
| 11-11 | Holiday | | |
| 11-13 | Cranking system | System service | Chp. 21 |
| 11-18 | Group theory test 4 | Indi-lab evaluations | |
| 11-20 | Lighting system | System service | Chp. 24 |
| 11-25 | Fall Break | | |
| 11-27 | Fall Break | | |

| | | | |
|-------|------------------------------------|-----------------------------|---------|
| 12-2 | Horn circuits | Circuit testing | Chp. 28 |
| 12-4 | Wiper circuits | Circuit testing | Chp. 28 |
| 12-9 | SRS circuits | System service | Chp. 27 |
| 12-11 | Group theory test 5 | Indi-lab evaluations | |
| 12-16 | Final Exam @ 8:30 – 10:30am | | |