

ATL 162 Course Outline as of Fall 2024**CATALOG INFORMATION**

Dept and Nbr: ATL 162 Title: ELECTRICAL 2

Full Title: Mobile Electrical Systems 2

Last Reviewed: 1/22/2024

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.50	17.5	Lecture Scheduled	43.75
Minimum	3.00	Lab Scheduled	1.50	6	Lab Scheduled	26.25
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 87.50

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

Students will learn mobile equipment body electronics, vehicle lighting, instrumentation, Original Equipment Manufacture (OEM) audio, navigation, communication systems, supplemental restraint systems, starter interlock systems, vehicle security systems, and computer-controlled charging systems. This course prepares students to take the Automotive Service Excellence (ASE) A6/T6 Electrical/Electronic Systems certification test. This course conforms with ASE Education Foundation instructional guidelines.

Prerequisites/Corequisites:

Course Completion of ATL 101 and ATL 161

Recommended Preparation:**Limits on Enrollment:****Schedule of Classes Information:**

Description: Students will learn mobile equipment body electronics, vehicle lighting, instrumentation, Original Equipment Manufacture (OEM) audio, navigation, communication systems, supplemental restraint systems, starter interlock systems, vehicle security systems, and

computer-controlled charging systems. This course prepares students to take the Automotive Service Excellence (ASE) A6/T6 Electrical/Electronic Systems certification test. This course conforms with ASE Education Foundation instructional guidelines. (Grade or P/NP)

Prerequisites/Corequisites: Course Completion of ATL 101 and ATL 161

Recommended:

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:

IGETC:	Transfer Area	Effective:	Inactive:
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CSU Transfer:	Effective:	Inactive:
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UC Transfer:	Effective:	Inactive:
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CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Test the Controller Area Network (CAN) BUS system signal with a Digital Storage Oscilloscope (DSO). Set up the DSO to capture the CAN hi (+) and CAN lo (-) signals
2. Test a computer-controlled charging system for proper operation using a DSO. Check and record the signal on a DSO from the Electronic Control Module (ECM) to the generator
3. Check a variable-speed blower control system for proper operation using a DSO. Check and record the Hertz signal from the control head to the blower module

Objectives:

At the conclusion of this course, the student should be able to:

1. Demonstrate the proper use of a digital multimeter (DMM), digital storage oscilloscope (DSO), test lights and fused jumper wires during diagnosis of electrical circuit problems
2. Inspect and test fusible links, circuit breakers, and fuses, repair wiring harnesses and connectors, and perform wire and terminal repair of electrical wiring
3. Identify and interpret electrical/electronic system concern, and determine necessary action related to body electrical systems
4. Verify Bus system communications
5. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation in lighting systems
6. Inspect, replace, and aim headlights and bulbs
7. Inspect and diagnose vehicle instrumentation
8. Inspect and diagnose Original Equipment Manufacturer (OEM) vehicle audio systems
9. Inspect and diagnose OEM vehicle navigation systems

10. Inspect and diagnose OEM vehicle communication systems
11. Diagnose, service and repair of supplemental restraint systems
12. Inspect and diagnose starter interlock systems
13. Inspect and diagnose computer-controlled charging systems
14. Inspect and diagnose OEM power window systems
15. Inspect and diagnose OEM locking systems

Topics and Scope:

Lecture-Related Topics and Scope:

- I. Fundamentals of Body Electronics
- II. Input, Processing, and Output
- III. BUS Systems
- IV. Lighting Systems
- V. Instrumentation
- VI. OEM Audio Systems
- VII. OEM Navigation Systems
- VIII. OEM Communication Systems
- IX. Supplemental Restraint Systems
- X. Starter Interlock Systems
- XI. Computer Controlled Charging Systems
- XII. Power Windows
- XIII. Locking Systems

Lab-Related Topics and Scope:

- I. Demonstrate Proper Shop Safety and Working Practices
 - A. Tools
 - B. Equipment
 - C. Hazardous Waste Handling
- II. Diagnosis and Repair of Body Electrical Systems
- III. BUS System Testing
- IV. Diagnosis and Repair of Vehicle Lighting Systems
- V. Diagnosis and Repair of Vehicle Instrumentation Systems
- VI. Diagnosis and Repair of Vehicle Audio, Navigation, and Communication Systems
- VII. Diagnosis and Repair of Vehicle Supplemental Restraint Systems
- VIII. Diagnosis and Repair of Starter Interlock Systems
- IX. Diagnosis and Repair of Computer Controlled Charging Systems
- X. Diagnosis and Repair of Power Window Systems
- XI. Diagnosis and Repair of Locking Systems

Assignment:

Lecture-Related Assignments:

1. Weekly reading (30-70 pages)
2. Weekly quizzes
3. Midterm exam
4. Final exam

Lab-Related Assignments:

1. Lab notebook
2. Weekly lab exercises and skill tests
3. Weekly lab reports

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Lab notebook

Writing
0 - 10%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab reports

Problem solving
5 - 20%

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

Lab exercises and skills test

Skill Demonstrations
30 - 50%

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

Weekly quizzes; midterm exam; final exam

Exams
30 - 50%

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

None

Other Category
0 - 0%

Representative Textbooks and Materials:

Automotive Electrical and Engine Performance. 8th ed. Halderman, James. Prentice Hall. 2020
Automotive Electricity and Electronics. Jones, David. CDX. 2018 (classic)
Advanced Automotive Electricity and Electronics. Klyde, Michael. CDX. 2018 (classic)
Instructor prepared materials