

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
AUT 241 - AUTOMOTIVE ELECTRICITY I (4 CR.)**

Course Description

Introduces electricity and magnetism, symbols and circuitry as applied to the alternators, regulators, starters, lighting systems, instruments and gauges and accessories. Part I of II. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

General Course Purpose

This course is part one of a two part series in automotive electrical systems designed to provide the student with a basic understanding of fundamental electrical theories required in the practical application of electricity to automotive electrical circuits. Emphasis is placed upon learning electrical terminology and definitions such as current, electromotive force and resistance. Instruction is included on methods of control and balance of electrical circuits, solving electrical problems by using Ohm's law, series circuits, parallel circuits, magnetism and the principles of electromagnetic induction. The student will develop an understanding of batteries to include construction, theory of operation, testing, installation in automobiles and servicing. The student will also develop an understanding of the automotive cranking circuit to include construction, theory of operation, testing, service and repair. Lecture demonstrations will cover in detail alternators and regulator fundamentals and theory of operation. Students will develop an understanding of each of these electrical components to include its construction, purpose, service requirements, and how it functions in automotive applications. Laboratory experience is provided in the use of diagnostic equipment and applicable test equipment in trouble shooting and adjusting or correcting electrical systems defects.

Course Prerequisites/Corequisites

The ability to read, write, and speak the English language.

Course Objectives

Upon completion of this course, the student should be able to:

- Understand basic electrical theory and its application to automotive electrical circuits
- Safely use and care for electrical test equipment
- Develop an understanding of the construction, testing and maintenance of the automotive storage battery
- Develop an understanding of magnetism, electromagnetic and electromagnetic induction and their application in automotive electricity
- Show an understanding of basic circuit understanding and troubleshooting
- Develop an understanding of the operation, testing and service of the automotive starting system
- Develop a detailed knowledge of possible defects, trouble shooting procedures, diagnosis and competency in performing repairs or adjustments needed to correct starting system malfunctions
- Show an understanding of the operation, testing and service of the automotive charging system
- Develop a working knowledge of possible defects, trouble shooting procedures, diagnosis and competency in performing repairs or adjustments needed to correct charging system malfunctions
- Develop a working knowledge of basic automotive lighting circuits

Major Topics to be Included

- Electrical system diagnosis and procedures
- Battery diagnosis and service
- Starting system diagnosis and repair
- Charging system diagnosis and repair
- Automotive wiring diagrams and schematics
- Introduce lighting circuits