

COURSE OUTLINE

Revised By: Howard Andersen 2014

DEPARTMENT:	Automotive Technology
CURRICULUM:	Automotive Technology
COURSE TITLE:	Advanced Electrical Systems
COURSE NUMBER:	AUT 102
TYPE OF COURSE:	Vocational Preparatory
COURSE LENGTH:	Normally 3 weeks
CREDIT HOURS:	4
LECTURE HOURS:	15 hours
LAB HOURS:	60 hours
CLASS SIZE:	20 maximum
PREREQUISITES:	MVM 100 (Introduction to Automotive Technology I), MVM 102 (Introduction to Automotive Technology II), AUT 100 (Introduction to Electricity), basic math skills, 9 th grade or higher reading level (as evidence by appropriate placement test scores), and/or instructor permission.

COURSE DESCRIPTION:

Contents include: safety, electrical theory, types of current, types of circuits, semiconductors, magnetism, EMI suppression, circuit protection, reading electrical schematics, circuit defects and using test equipment. Components covered are starting systems, charging systems, as well as removal and installation of electrical components from vehicles. In addition the function and construction of each component, and their diagnosis and service procedures will be covered. Instruction in safety, environmental awareness, human relations and leadership are taught as an integral part of this unit.

STUDENT LEARNING OUTCOMES ADDRESSED:

1. Critical Thinking – Use problem solving skills to diagnose and repair automotive electrical problems. (SLO 4.1)

2. Technology - Proper use and care of automotive electrical repair tools and equipment. (SLO 5.1)

PROGRAM OUTCOMES:

1. Inspect, diagnose, disassemble, repair, replace and service each of the major systems in various types of vehicles. (SLO 4.1)
2. Locate sources, make parts write-ups, calculate costs and explain repair or service. (SLO 2.1, 2.2 & 7.1)
3. Handle customer needs, complaints, questions and special challenges. (SLO 3.1 & 3.2)
4. Access and apply manufacturer's specifications in repair and replacement. (SLO 7.1)
5. Work safely and responsibly within all shop safety and environmental guidelines and standards. (SLO 6.4 & 6.5)
6. Demonstrate ability to pass the ASE test required for NATEF certification. (SLO 1.1, 1.2 & 7.1)
7. Communicate and document service records. (SLO 2.1)
8. Compute costs, time and measurements. (SLO 2.1, 2.2 & 7.1)
9. Work independently and in groups to service, repair, test and maintain vehicles. (SLO 3.1 & 6.3)
10. Use technology to test vehicles. (SLO 5.1)
11. Work with accuracy, dependability, proficiency and in a timely manner, when servicing equipment. (SLO 6.3 & 6.4)

GENERAL COURSE OBJECTIVES:

At the end of the course the student will:

1. Explain and demonstrate safety as it applies to the automotive industry.
2. Explain, identify, diagnose and repair different kinds of electrical circuits found on automobiles and light trucks.
3. Understand how to read schematics and component locators.
4. Explain, identify, and service different types of automotive batteries.
5. Understand High voltage batteries and starting systems used on hybrid vehicles
6. Explain, identify, and service starting systems found on automobiles and light trucks.
7. Explain, identify, and service charging systems found on automobiles and light trucks.
8. Demonstrate proficiency in NATEF competencies.

TOPICAL OUTLINE:

APPROX. HOURS

I. Automotive safety	5
II. Electrical system principles, components and operation	10
III. Electrical schematics and component locators	20
IV. Batter operation, diagnosis and service	10
V. Starting system operation, diagnosis and service	15
VI. Charging system operation, diagnosis and service	<u>15</u>
Total	75

