

NASSAU BOCES - ADULT EVENING PROGRAM

Joseph M. Barry Career & Technical Education Center
1196 Prospect Ave.
Westbury, NY 11590

COURSE OUTLINE

Course Name: **Auto Mechanics– IV (Auto Electric and Electronic Systems)**
Weeks: 10
Sessions: 20
Hours: 60
Days/Time: Tue/Thu, 7-10 pm
Instructor: Dave Fulton
Required Textbook: Automotive Technology: A Systems Approach, ERJAVEC
Prerequisites: None
Adult Evening Office: (516) 622-6950

Course Overview:

Today's automotive technicians must be familiar with electrical and electronic theory, diagnostics and repair. Learn about shorts, open circuitry, voltage drops, grounding AC-DC signals. Study battery service, starting, charging and lighting systems as well as on board computers, sensors, instruments, and accessories. Learn how A/C, dash units, memory seats and mirrors are controlled. Additional Cost: Students should have their own multimeter for this course. Textbook from Auto I will be required. Prerequisite: Auto Mechanics I & II.

Auto Mechanics Certificate: Requires Auto Mechanics I, Auto Mechanics II and Auto Mechanics III for a total of 240 hours.

Course Outline:

Session 1: Electricity & electrical fundamentals - Students will also learn the different sources of electricity & their uses in the automotive industry.

Session 2: Electrical circuits, their components, purposes & types. Ohm's law will also be covered.

Session 3: Digital Volt Ohm meter (DVOM) introduction & usage. Students will gain further knowledge in identifying types of electrical circuits and how to test them using a DVOM & Ohm's law.

Session 4: DVOM usage continued; test lights & logic probe differences & purposes; voltage drop & relay testing.

Session 5: Electrical Wiring Diagrams (schematics), identification, common problems (inc. shorts/ open circuit) & step-by-step troubleshooting procedures.

Session 6: Capacitance & Magnetism including hands on techniques.

Session 7: Automotive battery – includes construction, diagnoses, testing with hands on experience.

Session 8: Charging systems - Students will learn the hows & whys of the charging system including safely testing and using assorted tools, testers, and wiring diagrams.

Session 9: Automotive starter – includes the components, diagnoses & testing.

Sessions 10/11: In these two sessions students will learn how various electrical systems in today's automobile works. From power windows, power door locks to rear defogger etc. Students will learn how to test them using various test equipments.

Session 12: Automotive air conditioning system - Students will learn about the various components that make up the AC system. Includes hands on experience with diagnosing & testing.

Session 13: Electronic fundamentals - Learn the numerous components including semiconductors, diodes & the use of silicon. In this session some of the vehicle's on board computer functions will be explained.

Session 14: Hybrid vehicle systems - Students will learn all the safety precautions & preventative measures of working on a hybrid vehicle. All components will be covered along with some hands on.

Session 15: On Board Diagnosis fundamentals will be explained. This session is the start to the On Board Diagnosis (OBDII) sessions.

Session 16: OBDII computer sensors & actuators will be explained & discussed. Students will learn how these components are used in the On Board Diagnosis II systems.

Sessions 17 & 18: Students learn to use the On Board Diagnosis (OBDII) Scan tool to diagnose OBDII systems. Students gain hands on experience working with a scan tool and its functions.

Session 19: Evaporative Control System - Learn the components & testing procedures of this system along with hands on experience.

Session 20: In this session learn to use diagnostics flow chart & problem symptoms chart to help solve OBDII concerns.

Note: A two gig. computer flash drive (USB) is strongly recommended for this class. You will be provided with invaluable notes and video clips for reference and as learning tools.