

## AUTOMOTIVE SERVICES TECHNOLOGY II

*Automotive Services Technology II* is a one year course that encompasses the sub topics of the NATEF/ASE identified areas of Electrical Systems and Engine Performance. This one year course offering may be structured in a series of two topics per year offered in any combination of instructional strategies of semester based or yearlong instruction. Additional areas of manual transmissions and differentials, automatic transmissions, air conditioning, engine repair will be covered as as time permits. This one year offering must meet the NATEF program certifications for the two primary areas offered in this course. Mathematical skills will be reinforced through precision measuring activities and cost estimation/calculation activities. Scientific principles taught and reinforced in this course include the study of viscosity, friction, thermal expansion, and compound solutions. Written and oral skills will also be emphasized to help students communicate with customers, colleagues, and supervisors.

- DOE Code: 5546
- Recommended Grade Level: Grade 12
- Recommended Prerequisites: Automotive Services Technology I
- Credits: 2-3 credits per semester, maximum of 6 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- This course is aligned with postsecondary courses for Dual Credit
  - Ivy Tech
    - AUTC 113- Electrical Systems
    - AUTC 109- Engine Performance
  - Vincennes University
    - AUTO 110/L-Electrical Systems and Electrical Systems Lab

### Dual Credit

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

### Application of Content and Multiple Hour Offerings

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences. When a course is offered for multiple hours per semester, the amount of laboratory application or work-based learning needs to be increased proportionally.

### Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in SkillsUSA, the CTSO for this area.

## Content Standards

### Domain – Employability

**Core Standard 1** Students apply and adapt appropriate workplace behaviors and characteristics to prepare for automotive careers.

**Standards**

- ASTII-1.1 Demonstrate effective interpersonal skills
- ASTII-1.2 Develop leadership skills
- ASTII-1.3 Research, analyze, and use data for work assignments
- ASTII-1.4 Apply written communication skills
- ASTII-1.5 Demonstrate effective listening and speaking skills
- ASTII-1.6 Perform appropriate mathematical calculations correctly
- ASTII-1.7 Exhibit a responsible work ethic
- ASTII-1.8 Demonstrate accepted standards for ethical behavior
- ASTII-1.9 Establish a personal career goal and develop objectives for achieving the goal
- ASTII-1.10 Evaluate employment and career pathway opportunities related to established career interest(s)
- ASTII-1.11 Create a continuing education plan that identifies further education and training options
- ASTII-1.12 Develop skills needed to enter the workforce
- ASTII-1.13 Evaluate resources that keep workers current in the career field
- ASTII-1.14 Apply effective money management strategies
- ASTII-1.15 Identify tools and diagnostic equipment utilized in the service and repair of automotive electrical and electronic systems

**Domain – Knowledge/Understanding**

**Core Standard 2** Students analyze vehicle electrical components and system operations to establish accurate diagnosis and repair procedures.

**Standards**

- ASTII-2.1 Allocate the appropriate resources for task completion
- ASTII-2.2 Read and interpret written materials
- ASTII-2.3 Demonstrate knowledge of vehicle electrical system
- ASTII-2.4 Explain safety procedures
- ASTII-2.5 Demonstrate safe shop practices while working with electrical systems and test equipment
- ASTII-2.6 Identify tools and diagnostic equipment utilized in the service and repair of automotive electrical and electronic systems
- ASTII-2.7 Explain the basic laws of electricity
- ASTII-2.8 Define electrical circuit terminology and symbols
- ASTII-2.9 Identify electrical components in a simple electrical schematic and circuit
- ASTII-2.10 Calculate resistance, current, and voltage problems using Ohms Laws
- ASTII-2.11 Perform voltage, current, and resistance measurements using the proper measurement devices
- ASTII-2.12 Calculate resistance, voltage, and current in series, parallel, and series-parallel electrical circuits

- ASTII-2.13 Study starting and charging system theory and basic circuits
- ASTII-2.14 Perform voltage drop testing on starting and charging circuits
- ASTII-2.15 Perform battery testing and diagnosis
- ASTII-2.16 Calculate resistance, current, and voltage problems using Ohms Laws

**Domain – Diagnosis**

**Core Standard 3** Students analyze various vehicle system defects to determine necessary service.

**Standards**

- ASTI-3.1 Apply effective critical thinking, decision making, and problem-solving techniques
- ASTII-3.2 Perform Computerized Engine Diagnosis and Complete Repairs
- ASTII-3.3 Inspect and repair ignition system problems
- ASTII-3.4 Diagnose fuel, air induction, and exhaust systems
- ASTII-3.5 Troubleshoot, clean, and replace components of emission control systems

**Domain – Repair**

**Core Standard 4** Students apply and adapt industry procedure to perform service and repairs on various vehicle components and systems.

**Standards**

- ASTII-4.1 Select and use appropriate tools and technology
- ASTII-4.2 Implement quality assurance measures and safeguards
- ASTII-4.3 Evaluate resources that keep workers current in the career field
- ASTII-4.4 Perform Computerized Engine Diagnosis and Complete Repairs
- ASTII-4.5 Inspect and repair ignition system problems
- ASTII-4.6 Service fuel, air induction, and exhaust systems
- ASTII-4.7 Conduct other related engine service activities
- ASTII-4.8 Demonstrate safe shop practices while working with electrical systems and test equipment
- ASTII-4.9 Perform wiring repair