



**Transportation Technology V:
Applied Mechanics-Auto Technician Prep**

Second Semester

Course Information

Grade(s):	12th Grade
Discipline/Course:	Technology Education
Course Title:	Transportation Technology V: Applied Mechanics-Auto Technician Prep, Semester II
Prerequisite(s):	Transportation Technology IV: Advanced Automotive Mechanics (Full Year) <i>or</i> Transportation Technology IV: Advanced Automotive Mechanics (Semester) with teacher's permission <i>or</i> Teacher's Permission
Course Description: <i>Program of Studies</i>	This advanced level course offers Seniors an opportunity for leadership experience. Students build their automobile technician skills while working on actual vehicles in preparation for post-secondary educational/ training environments. Students will focus on completely overhauling, repairing, servicing and troubleshooting major automotive systems in a small-team environment. Emphasis is placed on researching system functions and issues, and problem-solving through a methodical practical hands-on process.
Course Essential Questions:	<ul style="list-style-type: none"> ● How does a knowledge of vehicle systems and how they operate enable an accurate diagnosis of a problem? ● How does an understanding of how major systems function enhance one's ability to analyze a system and come up with solutions? ● Why is it important to gather information to gain background knowledge related to a problem?
Course Enduring Understandings:	<ul style="list-style-type: none"> ● To be successful in the automotive industry, it is important to have a strong understanding of automotive systems, and diagnostic and repair/maintenance technologies. ● Technology is constantly evolving, and those working in the automotive industry need to be able to adapt to new technologies and tools. ● Adaptability and problem-solving skills are essential for overcoming unexpected challenges. ● Basic system functions of vehicles vary, but all vehicles rely on proper system implementation and maintenance to function properly.

	<ul style="list-style-type: none"> ● Problem-solving and diagnosis for automotive repair can be a rewarding profession to explore. ● Mechanical skills and technological repair skills are based on math and science concepts. ● There are essential skills needed to select and use appropriate materials, tools and machines as an automotive technician.
Duration/Credit:	Semester/0.5 credit
Course Materials/Resources:	Equipment and Consumables.
FPS Course Academic Expectation(s):	SE-Synthesizing and Evaluating CS-Collaborating Strategically
Semester at a Glance (Units):	Content Outline <ul style="list-style-type: none"> ● Unit 1- Major Systems Project-Auto Capstone Experience (17-20 weeks).

Unit Number and Title:	Major Systems Project-Auto Capstone Experience
Duration:	17-20 Weeks
Resource(s):	Textbook, Equipment & Online Research
Unit Overview:	Students will focus on rebuilding/constructing a fully functioning major system of a real vehicle through system analysis, in-depth research and developing solutions. Teams research and analyze operational principles of major automotive systems. This is a comprehensive, student- directed experience.
Learning Goals	
Standard(s):	<p>AUTO.03 Explain scientific principles in relation to chemical, mechanical, and physical functions for various engine and vehicle systems.</p> <p>AUTO.04 Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.</p> <p>AUTO.05 Diagnosis and repair engines, including but not limited to two- and four-stroke and supporting subsystems.</p> <p>AUTO.06 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.</p> <p>AUTO.07 Engine Performance: Describe the components and functions of the various systems that are related to engine performance.</p> <p>AUTO.09 Demonstrate function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with portable national industry standards.</p>
Essential Question(s):	<ul style="list-style-type: none"> ● How does a knowledge of vehicle systems and how they operate enable an accurate diagnosis of a problem? ● How does an understanding of how major systems function enhance one’s ability to analyze a system and come up with solutions? ● Why is it important to gather information to gain background knowledge related to a problem?

<p>Enduring Understanding(s):</p>	<ul style="list-style-type: none"> ● To be successful in the automotive industry, it is important to have a strong understanding of automotive systems, and diagnostic and repair/maintenance technologies. ● Technology is constantly evolving, and those working in the automotive industry need to be able to adapt to new technologies and tools. ● Adaptability and problem-solving skills are essential for overcoming unexpected challenges. ● Basic system functions of vehicles vary, but all vehicles rely on proper system implementation and maintenance to function properly. ● Problem-solving and diagnosis for automotive repair can be a rewarding profession to explore. ● Mechanical skills and technological repair skills are based on math and science concepts. ● There are essential skills needed to select and use appropriate materials, tools and machines as an automotive technician.
<p>Learning Goal(s): <i>Students will know and will be able to use their learning to:</i> (Content/ Skills)</p>	<p>Content: (Students will know...)</p> <ul style="list-style-type: none"> ● Logical problem solving methods are utilized to efficiently and correctly use resources, tools and machines to diagnose and repair automotive systems. ● The interrelationship between major systems of an automobile. ● Basic functions of the electrical systems. ● Various technologies in mechanical, electrical and fuel systems play an important role in the function, efficiency, and emission control of automotive systems. <p>Skills: (Students will be able to...)</p> <ul style="list-style-type: none"> ● Perform and document maintenance procedures in accordance with the recommendations of the manufacturer. The components and functions of various systems that are related to engine performance. ● Follow the procedures and practices of various manufacturers regarding repair and maintenance schedules. ● Demonstrate how to properly document maintenance procedures in accordance with applicable rules, laws, and regulations ● Use reference books, technical service bulletins, and other documents and materials related to the automotive service industry available in print and through electronic retrieval systems to accurately diagnose and repair vehicles.

- Evaluate the advantages and disadvantages of existing, new, and emerging systems and the effects of those systems on the environment.
- Diagnosis and repair engines, including but not limited to two- and four-stroke and supporting subsystems
- Perform general engine maintenance, diagnosis, service, and repair in accordance with portable national industry standards.
- Maintain, diagnose, service, and repair lubrication and cooling systems.
- Maintain, diagnose, and repair computerized engine control systems and other engine related systems.
- Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.
- Maintain, diagnose, and repair electrical systems.
- Ohm's Law in the diagnosis and repair of electrical systems.