Regional Occupational Program

Automotive Maintenance 2026-2027

COURSE DESCRIPTION

This course is designed to prepare students with a broad understanding of automobile maintenance and repair. The course includes theory and hands-on experiences to teach diagnosis and repair of engines, drive trains and suspension, steering and brake systems, as well as general maintenance. Upon successful completion of the course students should be able to obtain entry-level employment in automotive service and/or continue their training at a postsecondary educational institution.

Course Information

Course Length:	1 Year
Prerequisite:	None
Course Level:	Concentrator
UC:	No
Articulated:	No
Industry Cert.:	No
Industry Sector:	Transportation
Pathway:	Systems Diagnostics, Service and Repair
CALPADS:	8531

O*Net SOC Codes

49-3023	Automotive Service Technicians and Mechanics
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists

Legend

CTE - PS	CTE Pathway Standards
CRP	Career Ready Practices
CTE - AS	CTE Anchor Standards
CCSS	Common Core State Standards
ISTE	International Society for Technology in Education

Includes updates from 25/26 Transportation Advisory
Advisory Minutes

Automotive Maintenance

Course Orientation

a. Discuss objectives for this course, including competencies, teacher expectations, classroom policies, and procedures.
b. Identify and discuss the acquisition of transferable skills (communication, collaboration, creativity, and critical thinking) and their importance to being college and career ready and for future personal and professional success.
c. Review objectives, competencies, and course syllabus.
d. Discuss student and teacher expectations, including behavior, class rules, appropriate dress, pre-course knowledge, and grading policies, including enrollment and attendance requirements and procedures, and classroom/school safety and disaster procedures.
e. Discuss next steps in course sequence related to the career pathway, the need for reinforcement of basic skills, transferrable skills, and postsecondary and career options.
f. Discuss the Big Six: Career Ready Essentials and the Standards for Career Ready Practice as they relate to this course, all aspects of the industry sector, and being college and career ready.

Big Six: Career Ready Essentials

1. Effective Communication	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate effective verbal communication and conflict resolution skills. Use the writing process to develop written communication with the appropriate tone, organization, and format for the identified audience. **b. Use the writing process to develop written communication with the appropriate tone, organization, and format for the identified audience.** c. Explain the effect of interpersonal skills on one's ability to communicate effectively and develop relationships. d. Describe the impact of ineffective communication on business relationships. e. Analyze the impact of vocabulary, body language, and tone on verbal communication. f. Demonstrate active listening skills. g. Accurately interpret industry-specific written communication. h. Model responsible and effective use of various communication technologies. i. Identify valid and reliable digital reference and resource materials. j. Gather information from multiple digital sources to compare and contrast, synthesize, and summarize. k. Identify and use appropriate communication and collaboration technologies. l. Utilize technology to problem solve, accomplish tasks, and to produce or publish products.		1 2 11	2 3 4 5 7 8 9 10 11	**LS** 9-10 11-12.6 **SLS** 11-12.2 9-10 11-12.1 11-12.1d **WS** 11-12.7 11-12.6	**1b,c** **2c** **3b,c** **5c** **6b,c,d**

2. Collaboration, Creativity, and Critical Thinking	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate critical thinking skills for a variety of purposes and in different settings. Collaborate to reach consensus on an identical objective through the sharing of knowledge, tasks, and learning.		2 4 5	2 3 4	**LS** 9-10	1c 3c,d 4a-d

b. Collaborate to reach consensus on an identical objective through the sharing of knowledge, tasks, and learning. c. Discuss the importance of the critical thinking process to real-world applications. d. Evaluate the impact of creative thinking on problem solving and innovation in real-world applications. e. Compile work that demonstrates the process used to (elaborate, refine, analyze) evaluate original ideas and maximize creative efforts. f. Apply divergent and convergent thinking to the development of an original idea or solution. g. Examine real-world limits to adopting ideas. h. Demonstrate creative thinking (preparation, insight, evaluation, elaboration, and communication) to create a new idea or concept. i. Assume shared responsibility for collaborative work, and value the individual contributions made by each team member. j. Evaluate evidence, arguments, claims, and beliefs to identify connections. k. Identify bias, prejudice, propaganda, self-deception, distortion, and misinformation. l. Produce intellectual, informational, or material products that serve an authentic purpose. m. Work effectively and respectfully with those from diverse backgrounds or cultures. n. Demonstrate respect, trust, commitment, and the ability to compromise in collaborative projects.		7 9 10 11	5 7 8 9 11	11-12.6 **SLS** 9-10 11-12.1 11-12.1d 11-12.2 **WS** 11-12.7 11-12.6	5c,d 6c 7b,c,d
3. Leaders and Teams: Roles and Responsibilities	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Determine the individual and team members' roles and responsibilities. **b. Demonstrate leadership skills and qualities (i.e., reliability, negotiation skills, initiative, positive reinforcement, recognition of others' efforts, problem-solving skills, conflict resolution, and delegation).** c. Explain the importance of technical, social, and communication skills to team success. d. Compare and contrast leadership styles and their effectiveness in various situations. e. Organize and delegate responsibilities in a team setting to encourage ideas, perspectives, and contributions from all team members. f. Develop a strong sense of team identity by brainstorming solutions, volunteering, assisting others, practicing respect and courtesy, and taking initiative. g. Examine situations in which a follower becomes the leader. h. Describe twenty-first-century skills required across all occupations. i. Identify and discuss the characteristics of a successful team (i.e., leadership, cooperation, and effective decision-making). j. Leverage social and cultural differences to increase innovation and quality of work.		7 8 9	3 7 8 9 11	**SLS** 11-12.2 9-10 11-12.1 11-12.1d **WS** 11-12.6	7a,c

4. Legal, Ethical, and Environmental Considerations	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate industry specific ethical and legal practices. **b. Identify eco-friendly industry specific practices and resources.** c. Identify local, state, and federal regulatory agencies, entities, laws, and regulations. d. Identify discrimination based on race, nationality, religion, gender, age, disability, or sexual orientation. e. Summarize the ethical and legal implications of workplace discrimination and harassment. f. Explain the concept of corporate citizenship. g. Examine an employer's role in protecting the health and welfare of employees, the community, and the environment. h. Analyze current environmental laws and regulations and their impact on industry. i. Compare and contrast both society's and industry's impact on the environment.		5 7 8 12	3 5 7 8 9 11	**WS** 11-12.6 11-12.7 **SLS** 9-10 11-12.1 11-12.1d 11-12.2	2a,b 3a,b 5c 6c
5. Personal Growth and Career Planning	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate continued personal development and growth. **b. Develop and manage a personal growth and career plan.** c. Explain the relationship between sound financial habits and financial security. d. Create and manage a personal financial plan. e. Demonstrate initiative in achieving personal and professional goals. f. Apply time management strategies to meet deadlines. g. Demonstrate a growth mindset through flexibility and a positive attitude. h. Select and demonstrate appropriate job-search and retention techniques. i. Demonstrate strategies to prepare for employment. j. Demonstrate interpersonal skills appropriate for the workplace. k. Elaborate on the importance of perseverance to personal and professional success. l. Discover personal career interests, aptitudes, and skills.		1 2 3 4 6	2 3 4 7 8 11	**LS** 9-10 11-12.6 **SLS** 9-10 11-12.1 11-12.1d 11-12.2 **WS** 11-12.6	1a 3a,c 4d 6a,d 7b
6. Workplace Safety and Personal Wellness	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate proper industry specific safe work practices to prevent injury or illness. **b. Assess the potential impact of goal setting on personal and professional success.** c. Describe the role of security and emergency procedures in workplace safety. d. Describe the effect of preventative measures on emergencies in the workplace.		2 5 6 8	2 5 6 7	**LS** 9-10 11-12.6	1a,d 2a,d 5b

e. Identify and describe the causes, prevention, and treatment of common accidents. f. Identify local, state, and federal agencies that regulate workplace safety. g. Explain the role of the California Occupational Safety and Health Administration (Cal-OSHA) and the Environmental Protection Agency (EPA). h. Discuss the basics of system operations. i. Demonstrate the proper use of personal protective equipment (PPE). j. Explain the purpose of and accurately interpret a Safety Data Sheet (SDS). k. Identify hazardous materials and chemicals. l. Demonstrate proper procedures to respond to work-related accidents and injuries. m. Describe how ergonomics, housekeeping, and maintenance are related to accidents and injuries. n. Demonstrate cyber ethics, cyber safety, and cybersecurity. o. Assess the potential impact of preventative physical and mental health measures on workplace safety.		12	8 10 11	**WS** 11-12.7 11-12.6 **SLS** 9-10 11-12.1 11-12.1d	
Automotive Maintenance Units of Instruction					
7. Auto Shop and Personal Safety	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate proper general safety, personal safety, and tool and machine safety techniques and procedures in the automotive industry. b. Apply general safety rules associated with working on various vehicle systems, including hybrid, plug-in hybrid, electric, and other xEV/high-voltage vehicle systems. c. Follow safe procedures when handling tools and equipment. d. Explain safety-color coding. e. Properly place floor jacks and jack stands. f. Follow proper procedures for safe lift operations. g. Identify proper ventilation procedures in the shop area. h. Describe first aid procedures for an accident involving hazardous materials. i. Describe and demonstrate proper fire control and fire safety. j. Locate Safety Data Sheets (SDS) and describe their importance. k. Demonstrate awareness of the safety aspects of high-voltage circuits and vehicle systems, including high intensity discharge (HID) lamps, ignition systems, injection systems, and electrified vehicle high-voltage components.	C1.0 C1.1 C1.2	1 2 5 6 11 12	1 2 5 6 11	**LS** 9-10 11-12.6 **WS** 11-12.7 **RSTS** 9-10 11-12.4	
8. Tools and Equipment	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills in the safe handling practices of tools, equipment, and work process standards within the Automotive industry. b. Demonstrate the use of appropriate tools and equipment used to diagnose, service, repair, and maintain systems and components.	C2.0 C2.2 C2.5	1 2 5 6 11	1 2 5 6 11	**LS** 9-10 11-12.6 **WS**	

c. Identify and demonstrate the safe and proper use of common hand tools, power equipment, and lifting and hoisting equipment. d. Demonstrate safe and proper use and storage of tools and equipment. e. Identify standard and metric designation. f. Describe and demonstrate the safe and proper use of cleaning equipment. g. Organize and maintain a systematic storage system for hand and power tools. h. Explain how to care for and properly store automotive tools and equipment.				11-12.7 **RSTS** 9-10 11-12.4	
9. Researching Service Information	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills in typical maintenance procedures and documentation in accordance with the recommendations of the manufacturer. b. Locate service specifications using print and computerized service information references. c. Define the purpose of vehicle identification numbers, engine numbers, and date codes. d. Explain maintenance procedures in accordance with the recommendations of the manufacturer. e. Explain and properly demonstrate the use of reference books, computer resources, technical service bulletins, and other documents to accurately diagnose and repair automotive systems. f. Identify applicable vehicle and service information, such as vehicle service history, service precautions, vehicle identification numbers, component identification numbers, and calibration labels.	C2.6 C4.0 C4.3	1 2 4 5 11	1 2 4 5 11	**LS** 9-10 11-12.6 **WS** 11-12.6 **WS** 11-12.7	
10. Vehicle Service Preparation and Return	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills in typical maintenance procedures and documentation in accordance with the recommendations of the manufacturer. b. Provide necessary information and service as requested on a repair order. c. Demonstrate the proper use of floor mats and fender covers. d. Describe the three C's approach--concern, cause, and correction. e. Review the vehicle's service history. f. Complete a work that includes customer information, vehicle identification information, customer concern, related service history, cause and correction. g. Ensure the vehicle is prepared to return to the customer in accordance with school or company policies. h. Safety check, fill, and replace to proper fluid levels: oil, engine coolant, power steering fluid, brake fluid, windshield washer fluid, differential/transfer case fluid, transmission fluid, etc. i. Demonstrate proper completion of a work order in accordance with applicable rules, laws, and regulations.	C4.4	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	
11. Basic Vehicle Service	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**

a. Demonstrate safety practices while working with vehicle fluids. b. Demonstrate recommended procedures of various manufacturers to check and adjust levels of engine oil, engine coolant, steering fluid, brake fluid, and windshield washer fluid. c. Demonstrate recommended procedures of various manufacturers to correctly check and replace wiper blades. d. Demonstrate recommended procedures of various manufacturers to correctly check and adjust differential/transfer case fluid level. e. Demonstrate recommended procedures of various manufacturers to correctly check and adjust transmission fluid level. f. Demonstrate recommended procedures of various manufacturers to correctly inspect, replace, and adjust drive belts, tensioners and pulleys. g. Demonstrate recommended procedures of various manufacturers to correctly check pulley and belt alignment and adjust as needed. h. Demonstrate recommended procedures of various manufacturers to correctly inspect and replace air filters.	C4.0 C7.6	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	
12. Engine Repair	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills of engine and powertrain assemblies and appropriate maintenance services. b. Describe the operating principles of internal and/or external combustion engines. c. Identify and describe common symptoms of mechanical problems in an engine. d. Explain the visual checks to determine engine condition. e. Verify operation of the instrument panel engine warning indicators. f. Inspect engine assembly for leaks such as fuel, oil, coolant, and determine necessary action. g. Demonstrate and explain proper procedures to test, drain, and recover coolant. h. Demonstrate correct techniques to flush and refill cooling system. i. Demonstrate the steps of an oil and filter change. j. Explain common engine performance problems and their corrections. k. Explain and show how to remove and install a radiator. l. Inspect and demonstrate steps to replace powertrain mounts.	C3.1 C3.7	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	
13. Drive Train Systems	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills in the components, function, diagnosis, and repair of automotive drive train systems. b. Explain how to perform a basic driveline diagnostic check. c. Evaluate, diagnose and replace universal joints. d. Identify differential problems and appropriate repair services. e. Demonstrate how to correctly measure differential backlash using a dial indicator. f. Evaluate and diagnose constant-velocity (CV) joint noise and vibration problems.	C8.0 C8.6	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

g. Describe how to remove and replace a CV-axle assembly. h. Diagnose and repair axles, axle bearings and seals. i. Demonstrate and evaluate how to remove, repair, and reassemble a clutch assembly including the flywheel, pressure plate, disc, and release assembly. j. Explain how to adjust clutch linkage for free travel. k. Demonstrate skills to correctly perform a basic automatic transmission service. l. Compare the operation of a conventional transmission to the operation of an electronic transmission, including precautions to be followed in the routine service of an electronic transmission. m. Demonstrate how to perform a service on a transmission that includes changing fluid and filters. n. Visually evaluate a transmission, check for leaks, and examining the condition of fluid. o. Explain how to remove and replace a transaxle. p. Identify and explain common transaxle and drive axle problems.					
14. Suspension Systems, Steering and Wheel Alignment	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills in automotive suspension and steering systems. b. Compare and contrast the various types of suspension systems, including conventional, strut and electronic. c. Evaluate suspension components and determine repairs. d. Describe the function of each suspension system component. e. Diagnose and describe how to service steering system components. f. Explain the procedures used to prepare a vehicle for a two and four-wheel alignment, including manufacturer-required sensor checks. g. Describe wheel alignment angle. h. Diagnose wheel alignment and related sensor problems. i. Explain a two and four-wheel alignment using computer operated wheel alignment equipment. j. Explain how to diagnosis and service procedures on a MacPherson Strut suspension system. k. Demonstrate how to perform diagnosis and service procedures on a conventional suspension system. l. Diagnose and service rack and pinion steering. m. Diagnose and explain how to service gearbox type power steering systems. n. Describe and identify typical wheel alignment, steering, and suspension problems and appropriate repairs. o. Demonstrate and explain a thorough inspection of wheel alignment, steering, and suspension systems.	C8.4 C8.6	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	
15. Braking Systems	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**

a. Demonstrate knowledge and basic skills of automotive braking systems, their components, and their function. b. Identify and describe components of a basic braking system. c. Compare and contrast hydraulic, drum, and disc brake systems. d. Explain procedures for dismantling and cleaning brake system parts, including protection from hazards associated with asbestos brake pads and shoes. e. Analyze and diagnose brake system problems. f. Explain the procedures for dismantling and cleaning a brake system and its parts. g. Explain how an overhaul for a disc-type brake system and drum-type brake system. h. Demonstrate proper procedures to remove, bench bleed, and replace a master cylinder. i. Check and repair/replace damaged brake lines. j. Describe how to bleed the brake system. k. Describe the operation of anti-lock brake systems and how to repair problems in anti-lock brake systems. l. Describe procedures for performing a road test to check brake system operation, including an anti-lock brake system (ABS) and related safety system operation.	C8.3	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	
16. Basic Automotive Electrical Systems	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills of automotive electrical system components, including diagnostic and repair. b. Demonstrate techniques to diagnose and repair automotive electrical systems. c. Describe the safety practices that should be followed when working with electrical systems. d. Describe the flow of electricity in a simple circuit including voltage, amperage and resistance. e. Utilize electrical test instruments to measure voltage, amperage and resistance. f. Interpret wiring diagrams for a given vehicle and identify the electrical symbols. g. Explain how to construct a simple DC circuit and test for power and continuity. h. Identify charging and starting system components and summarize their operation. i. Describe basic charging and starting system tests. j. Describe how to start a vehicle using jumper cables or an auxiliary power supply. k. Clean and service a battery including the case, cables, connections, and check electrolytes. l. Demonstrate the necessary skills to perform battery capacity testing. m. Identify and describe conventional and electronic ignition system components. n. Compare the operating principles of a distributor system to an electronic ignition system. o. Describe horn and turn signal circuit operation. p. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits and check electrolytes. q. Compare the operating principles of a distributor system to an electronic ignition system. r. Describe horn and turn signal circuit operation.	C2.3 C3.5 C7.0 C7.1 C7.2	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

17. Heating and Air Conditioning	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate knowledge and basic skills of heating and cooling systems, including the function, maintenance, diagnosis, and repair. b. Explain the principles of refrigeration. c. Identify safety precautions and refrigerant handling requirements, including Section 609 certification awareness, when working on heating and air conditioning systems. d. Describe the basic operation and function of air conditioning and heater system components. e. Diagnose common heating and air-conditioning problems and determine if repairs are needed. f. Diagnose automatic temperature control problems on a heater/air conditioning system. g. Describe the basic operation and function of air conditioning system components. h. Explain how to replace major air conditioning and heating components. i. Demonstrate how to test the operation of the air conditioning system and measure the system operating pressures. j. Describe the general procedures for evacuating and charging an air conditioning system using approved refrigerant-handling equipment and manufacturer procedures. k. Check the system for leaks, determine necessary repairs, and follow refrigerant handling requirements.	C3.2 C7.5	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

18. Engine Performance and Tune Up	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Identify and describe the components of an engine. b. Identify the visual checks to determine engine condition. c. Describe the operating principles of internal and/or external combustion engines. d. Verify operation of the instrument panel engine warning indicators. e. Identify and describe common symptoms of mechanical problems in an engine. f. Describe how to perform a dry and wet compression test. g. Explain how to perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert. h. Demonstrate proper repair techniques using appropriate tools and equipment.	C3.1 C3.7	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

Standards Alignment

The curricula have been aligned with the CTE Model Curriculum Standards released in 2013. Each industry sector was updated to meet the increased rigor and relevancy requirements of the Common Core State Standards. The curriculum also includes the new Standards for Career Ready Practices.

Standards for Career Ready Practice

1. *Apply appropriate technical skills and academic knowledge.*
2. *Communicate clearly, effectively, and with reason.*
3. *Develop an education and career plan aligned with personal goals.*
4. *Apply technology to enhance productivity.*
5. *Utilize critical thinking to make sense of problems and persevere in solving them.*
6. *Practice personal health and understand financial literacy.*
7. *Act as a responsible citizen in the workplace and the community.*
8. *Model integrity, ethical leadership, and effective management.*
9. *Work productively in teams while integrating cultural and global competence.*
10. *Demonstrate creativity and innovation.*
11. *Employ valid and reliable research strategies.*
12. *Understand the environmental, social, and economic impacts of decisions.*

CTE Anchor Standards—Common Core English Language Arts Alignment

Anchor Standard 1: Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the industry sector alignment matrix for identification of standards. Note: alignment listed within each sector.

Anchor Standard 2: Communications

Language Standard: Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the (career and college) readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. LS 9-10, 11-12.6

Anchor Standard 3: Career Planning and Management

Speaking and Listening Standard: Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. SLS 11-12.2

Anchor Standard 4: Technology

Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments and information.

Anchor Standard 5: Problem Solving and Critical Thinking

Writing Standard: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow or broaden the inquiry when appropriate, and synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. WS 11-12.7

Anchor Standard 6: Health and Safety

Reading Standards for Science and Technical Subjects: Determine the meaning of symbols, keywords, and other domain-specific words and phrases as they are used in a specific scientific or technical context. RSTS 9-10, 11-12.4

Anchor Standard 7: Responsibility and Flexibility

Speaking and Listening Standard: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively. SLS 9-10, 11-12.1

Anchor Standard 8: Ethics and Legal Responsibilities

Speaking and Listening Standard: Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the work. SLS 11-2.1d

Anchor Standard 9: Leadership and Teamwork

Speaking and Listening Standard: Work with peers to promote civil, democratic discussions and decision making; set clear goals and deadlines; and establish individual roles as needed. SLS 11-12.1b

Anchor Standard 10: Technical Knowledge and Skills

Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. WS 11-12.6

Anchor Standard 11: Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the industry-sector anchor standards, pathway standards, and performance indicators in the classroom, laboratory, and workplace settings, and the career technical student organization. Note: no alignment evident for this standard. WS 11-12.6

CTE Model Curriculum Standards—Industry Sectors and Pathways

Transportation

C. Systems Diagnostics, Service, and Repair Pathway

C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.

C1.1 Know and understand common environmental conservation practices and their applications.

C1.2 Practice the safe handling and storage of chemicals and hazardous wastes in accordance with Material Safety Data Sheets (MSDS) and the requirements of local, state, and federal regulatory agencies.

C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.

C2.1 Recognize the importance of calibration processes, systems, and techniques using various measurement and testing devices.

C2.2 Demonstrate and use appropriate tools and equipment—such as wrenches, sockets, and pliers—to diagnose, service, repair, and maintain systems and components.

C2.3 Use tools, equipment, and machines to safely measure, test, diagnose, and analyze components and systems (e.g., electrical and electronic circuits, alternating- and direct-current applications, fluid/hydraulic and air/pneumatic systems).

C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.

C3.1 Describe the operating principles of internal and/or external combustion engines.

C3.2 Describe the function and principles of air-conditioning and heating systems.

C3.5 Practice the basic principles of electricity, electronics and electrical power generation, and distribution systems.

C3.7 Perform necessary procedures to maintain, diagnose, service, and repair vehicle systems and malfunctions.

C4.0 Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.

C4.3 Use reference books, technical service bulletins, and other documents and materials related to the service industry available in print and through electronic retrieval systems to accurately diagnose and repair systems, equipment, and vehicles.

C4.4 Complete a work order, including customer information, description of repairs, and billing information, in accordance with applicable rules, laws, and regulations.

C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.

C7.1 Practice maintenance, diagnosis, and repair of electrical systems.

C7.2 Maintain, diagnose, repair, and service batteries.

C7.5 Diagnose, service, and repair heating and air-conditioning systems and components.

C7.6 Diagnose, service, and repair horns, wipers/washers, and other accessories.

C8.0 Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.

C8.3 Diagnose, service, and repair disc brakes, drum brakes, antilock brakes, and other brake systems as developed.

C8.4 Diagnose, service, and repair steering and suspension systems.
C8.6 Maintain, diagnose, service, and repair under-vehicle systems and malfunctions.

ISTE Standards for Students

1. Empowered Learner- Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.

a) Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.

b) Students build networks and customize their learning environments in ways that support the learning process.

c) Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways

d) Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

2. Digital Citizen- Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.

a) Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

b) Students engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.

c) Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

d) Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

3. Knowledge Constructor- Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.

a) Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

b) Students evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources.

c) Students curate *information from digital resources using a* variety of tools *and methods to create* collections of artifacts *that demonstrate* meaningful connections or conclusions.

d) Students build knowledge *by actively* exploring *real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.*

4. Innovative Designer- Students use a variety of technologies within a design process to identify and solve problems creating new, useful, or imaginative solutions.

a) Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.

b) Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

c) Students develop, test, and refine prototypes as part of a cyclical design process.

d) Students exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

5. Computational Thinker- Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

a) Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.

b) Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

c) Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

d) Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. Creative Communicator- Students communicate clearly and express themselves creatively for a variety of purposes using platforms, tools, styles, formats, and digital media appropriate for their goals.

a) Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

b) Students create original works or responsibly repurpose or remix digital resources into new creations.

c) Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations.

d) Students publish or present content that customizes the message and medium for their intended audiences.

7. Global Collaborator- Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

a) Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

b) Students use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints.

c) Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

d) Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.