DE AUTOMOTIVE SERVICE FUNDAMENTALS B	
CURRICULUM/CONTENT AREA	**COURSE LENGTH**
Applied & Technical Education (ATE)	*1 Term*
GRADE LEVEL	**DATE LAST REVIEWED**
10-12	*2023*
PREREQUISITE(s) ***if applicable***	**BOARD APPROVAL DATE**
Automotive Service Fundamentals A	*9/10/2024*
PRIMARY RESOURCE ***if applicable***	

DESIRED RESULTS

COURSE DESCRIPTION AND PURPOSE

This automotive course is a continuation of Automotive Service Fundamentals A, which focuses on developing skills in professionalism, safety, and the use of basic hand and power tools in accordance with industry standards. Students are introduced to the automotive service industry and learn to use service information to perform basic under-hood and under-car services. Classroom activities will stress automotive fundamentals and theories. Shop activities will center on basic servicing of the automobile with safety being a priority. After finishing Automotive Fundamentals A & B with a grade of an "A" or "B" the course can be Transcripted Credit with WCTC.

ENDURING UNDERSTANDINGS *Students will understand that...*	**ESSENTIAL QUESTIONS** *Students will keep considering...*
Creativity, innovation, and critical thinking are essential for success in a technologically advanced world.	Why is creativity and innovation important? How is creativity and innovation used in [name of career pathway]?
	How do teams efficiently and effectively solve problems in an increasingly complex world?
	What strategies and processes can I use to become a more effective creator, thinker and problem solver?
The ability to communicate and collaborate with people with diverse backgrounds and perspectives is key to participation in a global economic society.	Why is communication and collaboration important? How do positive work behaviors and personal qualities impact communication and collaboration?
	What is effective teamwork? What strategies can I use/teams use to work better together? How can perspectives and experiences of a diverse group develop innovative solutions to a given problem?
Career and technical education provides pathways to high-demand, high-wage career opportunities, and personal fulfillment.	Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally?
	How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?
	What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?

PRIORITY CAREER & TECHNICAL STANDARDS

Students will be skilled at...

Creativity, Critical Thinking, Communication and Collaboration

4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.

a: I develop effective resolutions for a given problem, decision or opportunity using available information.

b: I develop and implement a resolution for a new situation using personal knowledge and experience.

Career Development

CD4: Students will identify and apply employability skills.

a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.

b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job.

c: I identify and exhibit traits for retaining employment.

d: I develop positive relationships with others.

Information, Media, Technology
IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.
a: I choose appropriate sources of data and information for a given purpose.
b: I determine the relevance, validity and timeliness of data and information.
c: I select relevant information necessary for making decisions and solving problems
d: I apply data and information to communicate ideas and create new opportunities.

PRIORITY CONTENT STANDARDS
Students will know...

Standard: BB1: Students will analyze the core concepts of technology.

Standard: ENG1: Students will analyze and demonstrate the attributes of design.

Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.

Standard: ICT1: Students will analyze, select and use information and communication technologies.

Standard: MNF1: Students will be able to select and use manufacturing technologies.

Potential INDUSTRY-RECOGNIZED CREDENTIALS (IRCs) Opportunties associated with the course	Potential WORK BASED LEARNING (WBL) opportunities associated with the course
Student ASE Certification (G1-Maintenance & Light Repair)	Dealership/Shop Job Shadow
Safety Certification	Youth Apprenticeship-1 or 2 year
Lift Certification	
Potential DUAL CREDIT Opportunties associated with the course	
Auto Service Fundamentals Transcripted Credit (WCTC)	

UNIT 1: INTRODUCTION TO THE AUTOMOVITE IND/ SAFETY		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.6.h: I can evaluate how selfdiscipline, self-worth, positive attitude and integrity displayed in a work situation affect employment status.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.6.h: I can defend a proposal for a new product or service based on data and information analysis.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Describe the types of jobs available in the automotive industry.* *Explain training and education options for technicians.* *Explain the areas of ASE certification.* *Describe the reasons for the changes in automotive design and construction.* *Explain how to safely operate vehicles in the shop. (NATEF RST SAFETY #5)* *Identify and demonstrate proper safety in the automotive shop. (NATEF SAFETY #3,4,8,&10)* *Inspect and demonstrate the use of basic shop equipment. (NATEF RST SAFETY #2)* *Identfy and demonstrate correct behaviors for the automotive shop. (NATEF RST SAFTEY #1,6,7,9,11&12)* *Identify and use emergency showers and eyewash statioins. (NATEF RST SAFETY #2)* *Locate, read, and interpret material safety data sheets. (NATEF RST SAFETY #15)* *Demonstrate safe battery handling.* *Identify chemical hazards and demonstrate safe use and disposal of various automotive chemicals. (NATEF RST SAFETY #2 & 5)* *Identify fire hazards and fire extinguishers and demonstrate fire extinguisher use. (NATEF RST SAFETY #7)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
Name some of the new features that are now included on todays' vehicles.	Key vocabulary: air tools, asbestos, blow guns, carbon monoxide, creepers, engine hoists, eyewash stations, floor jack, hazardous waste, mechanical safety latch, mechanic's gloves, nitrile gloves, personal hygience, personal protective equipment (PPE), respirators, safety data sheets, work ethic, Z.87 standard	
What are some of the aera's that a technician needs to be highly qualified?		
What are some of the careers in the automotive industry? Name them.		
Name some of the certifications the a technician can earn.		
Why must a technician have safe working habits?		
Name some PPE that a technicaiin should be aware of.		
How does one raise and support a vehicle properly?		
How does one remove and charge a batter safely?		

What are some key safety items that a technician should know where and how to use them in a shop?		
What is the purpose of an MSDS?		
What is the difference between orange and red wiring on a vehicle?		

UNIT 2: TOOLS & EQUIPMENT/SHOP ORIENTATION		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.10.h: I can manage work roles and responsibilities to balance them with other life roles and responsibilities.	
b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job.	CD4.b.7.h: I can employ critical thinking and decision-making skills to exhibit qualifications to a potential employer in an interview.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Identify the job requirements, routines, and housekeeping procedures for automotive technicians. (NATEF RST SAFETY #1)* *Identify basic hand and power tools and the correct operation for these tools. (NATEF RST TOOLS #1,2,3&4)* *Demonstrate safe operation of vehicle hoists and jacking equipment. (NATEF RST SAFETY #3 &4)* *Identify and locate vehicle identification information. (NATEF RST SERVICE #1)* *Identify and coplete a repair order and maintain customer technician records. (NATEF RST SERVICE #1&5)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
What are some of skills needed in the automotive career and auto repair industry?	*Key vocabulary:* *above ground lift, air hamer, battery charger, bench grinders,*	

Name the tools that a technician would use in the automotive field.	*calibration decal, chain of command, combination wrench, dead blow hammer, emissions decal, fastener, impact wrench, in-ground lift, parts washer, pliers, punches, repair order, rubber mallet, screwdriver, service order, sockets, VIN, vice*	
What are the common drive end sizes for the common ratchet?		
Describe how to fix and repair damaged threads.		
Name the tools used to fix repair and fix damaged threads.		
What are the two common types of power tools that a technician would use on a vehicle?		
Describe to how to torque a fastner to the correct torque.		
What does YMM stand for and why is it so important for a technician to know?		
Where is the VECI located and what information would it be used for?		
Name the types of lifts and how they operate that could be found in an automotive shop.		

UNIT 3: BASIC TECHNICIAN SKILLS		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.6.h: I can use existing knowledge to develop a resolution for a new situation, problem or opportunity.	
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.6.h: I can evaluate how selfdiscipline, self-worth, positive attitude and integrity displayed in a work situation affect employment status.	
b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job.	CD4.b.6.h: I can prepare a resume, cover letter, employment application.	
	CD4.b.7.h: I can employ critical thinking and decision-making skills to exhibit qualifications to a potential employer in an interview.	
c: I identify and exhibit traits for retaining employment.	CD4.c.4.h: I can model behaviors that demonstrate reliability and dependability.	
	CD4.c.6.h: I can complete required employment forms and documentation.	
	CD4.c.7.h: I can summarize key activities necessary to retain a job in an industry.	
d: I develop positive relationships with others.	CD4.d.6.h: I can evaluate the best method to assist co-workers in accomplishing goals and tasks.	
	CD4.d.8.h: I can use a systematic approach to academic and career planning for students to achieve their learning, socio-cultural and work goals.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.7.h: I can synthesize data and information from multiple sources to identify new trends.	
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Identify and demonstrate skills necessary for employment.* *Demonstrate proper communication skills.* *Identify and apply math skills related to automotive application.* *Identify and apply math skills related to automotive application.* *Identify areas of a dealership (visit area dealerships).*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
Why is non-verbal communication skills important to the job?		

Name the two different measuring systems that a technician would use? and show how to use both.	Key vocabulary: aftermarket, chemical reaction, employability skills, flat-rate guide, hydraulics, initiative, linear measurement, metric measurement, motivation, nonverbal communication, body language, OE parts, percentage, ratio, resume, specific gravity, torque, vacuum, warranty time	
What are atoms and how are they used in the automobile?		
What is the difference between atmospheric pressure and vacuum pressure?		
Name the different characteristics of electricity.		
What information is located on a resume and cover letter?		
Describe what information is on a repair order and how they are used?		
Name the different areas of a dealership?		
What is the difference between flat-rate compaired to hourly rate?		

UNIT 4: WHEELS, TIRES, AND WHEEL BEARINGS		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback. Students continually reflect on and discuss essential questions in their notebook and orally in class
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.		
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems		
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.		
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Identify different types of tires and their construction. (NATEF MLR 4. D.1)* *Rotate tires per the manufacturer's specifictions. (NATEF MLR 4.D.2)* *Check and adjust tire pressure. (NATEF MLR 4.D.1)* *Inspect the wheel and tire for air loss and repair tire. (NATEF MLR 4. D.5 & 4.D.6)* *Check for lateral and radial runouts. (NATEF MLR 4.D.1)* *Identify and service components of the tire pressure monitoring system. (NATEF MLR 4.D.4, 4.D.7, & 4.D.8)* *Service wheel bearings. (NATEF MLR 3.D.1 & 5.F.1)* *Inspect and replace wheel studs. (NATEF MLR 5.F.6)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
What are some the similarities and differences between radial tire and run-flat tires?	Key vocabulary: air pressure, all-season tires, asymmetrical tires, centerbore, contact patch, direct TPMS, directional tires, dynamic wheel balance, hubcap, indirect TMPS, lateral renout, performance tires, pounds per square inch, radial runout, run-flat tires, shimmy, static wheel balance, temperature rating, tire rotation, TPMS reset, traction rating, tramp, treadwear rating, wheel bearing, wheel offset	
What are the benefits of a kneumatic tire on a vehicle?		
What information is located on the tire and what does it mean?		
What is the difference between direct and indirect TPMS systems?		
Describe how and when a TPMS should be reset or relearned.		
Name all the items that are included on a tire inspection.		
Describe how a to replace a wheel stud.		

When should wheel bearings be serviced?		
How and why are tire rotation part of vehicle maintenance?		

UNIT 5: SUSPENSION SYSTEMS SERVICE		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.		
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems		
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.		
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Identify the tools and their correct usage for servicing the suspension system.* *Perform suspension system component inspection. (NATEF MLR 4.B. 9, 4.B.11, 4.B.12, 4.B.13, 4.B.14, 4.B.16, 4.B.17, 4.B.18, & 4.B.19)* *Diagnose suspension system concerns, including incorrect ride height, noises, excessive bounce and sway, and increased tire wear.* *Perform prealignment inspection and measure vehicle ride height. (NATEF MLR 4.C.1)* *Describe wheel alignment angles. (NATEF MLR 4.C.2)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
What are some safe working practices when working on suspensions?	*Key vocabulary:* *axle puller, camber, camber roll, caster, corrective alignment, geometric centerline, grease fitting, maintenance alignment, prealignment inspection, ride height, spring compressors, strut spring compressor, thrust line, toe, visual inspection*	
What is the proper and safe way to compress and handling springs?		
Expain how to do a vehicles ride height measurement.		
When are speciality tools used on suspension repair?		
Explain the difference between caster and camber.		
How is a angle sensor reset done on a vehicle? and when is it done?		

What are some factors that a technician should be checking for on a test drive of the vehicle?		

UNIT 6: STEERING SERVICE		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.		
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems		
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.		
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Identify and safely use tools for steering system service.* *Inspect, remove, and replace steering linkage components. (NATEF MLR 4.B.1, 4.B.7, & 4.B.8)* *Perform a prealignment inspection. (NATEF MLR 4.C.1)* *Determine proper power steering fluid type; inspect fluid level and condition. (NATEF MLR 4.B.2)* *Flush the power steering system. (NATEF MLR 4.B.3)* *Inspect for power system fluid leakage; determine necessary action. (NATEF MLR 4.B.4)* *Remove, inspect, replace, and adjust power steering pump drive belt. (NATEF MLR 4.B.5)* *Inspect and replace power steering hoses and fittings. (NATEF MLR 4.B.6)* *Inspect electric power steering assist system. (NATEF MLR 4.B.21)* *Identify hybrid vehicle power steering system electrical circuits and safety precautions. (NATEF MLR 4.B.22)* *Explain the operation of nonhydraulic power steering assist systems.* *Identify hybrid vehicle power steering electrical systems.*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
What would be the cause of hard steering? What steering component is a very common wear item? and how does one inspect the part?	*Key vocab:* *belt wear gauge, drive belt tensioner, dry-park check, EPS warning light, inner tie rod socket, Pitman arm puller, power steering fluid flush, steering damper*	

When and what speciality tools are used on steering components?	*flush, steering damper*	
How are worn strut bearing plates diagnosed?		
What are some of the differences/similarities of rack and pinion and parallelogram steering system?		
How often do drive belts need to be serviced?		
Where can electric steering assist be applied?		
How often should power steering fluid be serviced?		

UNIT 7: BRAKE SYSTEM SERVICE		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.		
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems		
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.		
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Describe procedure for perorming a road test to check brake system operation, including an antilock brake system (ABS). (NATEF MLR 5. A.2)* *Inspect and adjust brake pedal height, pedal travel, and free play. (NATEF MLR 5.B.1)* *Check master cylinder for external leaks and proper operation. (NATEF MLR 5.B.2)* *Inspect and service brake linings, hoses, and fittings. (NATEF MLR 5. B.3)* *Select, handle, store, and fill brake fluids to proper level. (NATEF MLR 5.B.4)* *Identify and inspect components of the brake warning light system. (NATEF MLR 5.B.5)* *Flush and bleed the brake hydraulic system. (NATEF MLR 5.B.6)* *Inpect brake fluid condition and test for contamination. (NATEF MLR 5.B.7)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
How does one check the brake pedal height?	*Key vocabulary:* *brake hardware, clearance gauge, drum brake micrometer, floating drums, grabbing, holddown spring tool, maximum diameter, return spring tool, wet sink*	
How often should the brake system be flushed ?		
Explain how to propperly fill and inspect the brake fluid?		
What happens to brake fluid over time in the brake system?		
What are the areas a master cylinder can leak from?		

What are the components of the brake system?		
What areas can a leak happen on the brake system?		
How does one flush a brake system with ABS brakes?		

UNIT 8: BASIC ELECTRICAL/ELECTRONIC SYSTEM SERVICE		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Describe and perform voltage, amperage, and reisitance tests. (NATEF MLR 6.A.4)* *Interpret and use wiring diagrams. (NATEF MLR 6.A.3)* *Describe and diagnose circuit faults. (NATEF MLR 6.A.5 & 6.A.7)* *Identify and test ciruit protection devices. (NATEF MLR 6.A.9)* *Check operation of circuits protection devices. (NATEF MLR 6.A.6)* *Perform wiring repairs. (NATEF MLR 6.A.10)* *Replace electrical connectors and terminal ends. (NATEF MLR 6.A.11)* *Test relay operation.*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
What are the safety percautions when working on the electrical system?	*Key vocabulary:* *backprobing, circuit faults, continuity, electrical shock, fretting, inductive current clamp, open circuit, resistance test, schematic, short circuits, test light, thermal cycling, unwanted resistance, voltage drop*	
What is ESD and what damage could accur?		
What is the difference between voltage and voltage drop?		
When would measuring resistance be usefull?		
When testing for amperage in a circuit where is the meter placed?		
Name the 3 types of curciut faults.		
What is the difference between a open and closed curcuit?		
How does one read a wiring schematic?		

UNIT 9: STARTING & CHARGING SYSTEM SERVICE		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.		
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems		
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.		
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery. (NATEAF MLR 6.B.8)* *Diagnose starting system concerns such as no-crank no-start conditions.* *Test starter current draw and starting system voltage drops. (NATEF MLR 6.C.1)* *Remove and replace a starter motor. (NATEF MLR 6.C.4)* *Inspect the charging system.* *Test generator output. (NATEF MLR 6.D.3)* *Perform charging system system voltage drops. (NATEF MLR 6.D.4)* *Remove and replace a generator. (NATEF MLR 6.D.3)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
What is the maximum time a starter can be cranked for and why?	*Key vocabulary:* *battery corrosion, battery hold-down, battery load test, battery registration, conductance tester, fast charging, no-crank concern, overcharging, parasitic load, slow charging, starter cranking current, undercharge condition*	
How are high voltage wiring indicated?		
Explain what a visual inspection of the battery would include.		
What is the voltage of a fully charged battery?		
What is the difference between fast and slow charging? and which is better?		

How is a key-off battery draw performed and what does it establish?		
What is the operation for a battery load test?		
Explain what a visual inspection of the starting and charging system would include.		

UNIT 10: ENGINE MECHANICAL TESTING AND SERVICE		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Inspect an engine for leaks. (NATEF MLR 1.A.3)* *Perform engine mechanical test, including: Vacuum test (NATEF MLR 8.A.2), Cylinder power balance test (NATEF MLR 8.A.3), Cranking and running compression test (NATEF MLR 8.A.4), Cylinder leakage test (NATEF MLR 8.A.5).* *Inspect the exhaust system for leaks and damage. (NATEF MLR 8.C.3 & 8.C.4)* *Check and adjust valve lash. (NATEF MLR 8.B.1)* *Inspect and replace a timing belt. (NATEF MLR 1.A.5)* *Explain the difference between a gasket and a seal.* *Install engine covers using gasket, seals, and sealers as required. (NATEF MLR 1.A.4)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
Where are the common places for oil to leak from on an engine?	*Key vocabulary:* *cranking compression test, cylinder leakage test, engine mounts, gasket, interference engines, oil pressure test, power balance test, relative compression test, running compression test, seal, UV dye, valve lash*	
When should a UV dye be added to the oil?		
What are some of the diffferent types of exhaust readings a technician can use for diagnosing engine problems?		
Name different types of internal engine noises that may lead to damage of the engine.		
What is the difference between a leak-down test and a power balance test?		

Using a compression test and a running compression test which test would be better suited to diagnose valve trian issues?		
Which type of engine needs peridic valve adjustments?		

UNIT 11: ENGINE PERFORMANCE SERVICE		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.		
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems		
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.		
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Inspect and replace fuel filters and fuel lines. (NATEF MLR 8.C.1)* *Remove and replace spark plugs. (NATEF 8.A.7)* *Explain OBD II operation.* *Explain OBD II monitors, thier functions, and how to determine monitor status. (NATEF MLR 8.B.2)* *Retrieve and understand OBD II diagnostic trouble codes. (NATEF MLR 8.B.1)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
How does one go about replacing a fuel filter?	*Key vocabulary:* *active test, air filter, comprehensive component monitor (CCM), continous monitor, drive cycle, enhanced OBD (EOBD), freeze frame, fuel trim, global OBD, history code, intrusive test, misfire monitor, monitor, noncontinuous monitors, oxygen sensor monitor, passive*	
What is the operation for replacing spark plugs in a vehicle?		
What are some of the important codes used in the OBD II system for diagnosis?		
Why is it important to look at the DTC's for a vehicle?		
What is MIL and where is located on a vehicle?		
What is the difference between STFT and LTFT?		

UNIT 12: DRIVETRAINS AND TRANSMISSIONS		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.		
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems		
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.		
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Describe automatic and manual transmission operation. (NATEF MLR 2.A.1, 3.A.1, & 3.C.1)* *Drain and replace transmission fluid and filter. (NATEF MLR 2.B.4)* *Describe continuously variable transmission and hybrid transmission operation. (NATEF MLR 2.C.1 & 2.C.2)* *Drain and refill manual transmissions and final drive units. (NATEF MLR 3.A.2)* *Inspect clutch fluid level, check for leaks, and bleed a hydraulic clutch system. (NATEF MLR 3.B.1 & 3.B.2)* *Describe the operation of electronically controlled manual transmission. (NATEF MLR 3.C.1)* *Inspect and service front-wheel drive half shafts. (NATEF MLR 3.D.2)* *Check locking hub assemblies. (NATEF MLR 3.D.3)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
What is LSD and what type of fluid must be used?	*Key vocabulary:* *automatic tranmission fluid (ATF), clutch disc, constant velocity joints, continuously variable transmission (CVT), differential, dual-clutch transmission, gear reduction, half shafts, limited-slip differential (LSD), overdrive, planetary gearset, power-split device, pressure plate, release bearing, shift solenoid, torque converter, transaxle*	
What is the difference between a automatic and CVT transmission?		
Why are synchronizers used in a manual transmission?		
What is the purpose of the touque converter/		
Explain what a planetary system is and how is works.		
What is the difference between high and low gear ratios?		

UNIT 13: HEATING AND AIR CONDITIONING		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can...* *Describe the components and operation of the heating and air conditioning systems.* *Identify hybrid vehicle high-voltage air conditioning components.* *Inspect the air conditioning condensor air flow restrictions.* *Inspect heating and air conditioning ducts.* *Identify sources of odors from the air conditioning system.* *Inspect and service cooling system hoses.* *Inspect and replace the engine thermostat.* *Drian, flush, refill, and bleed the cooling system.*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
What are the two main refridgerants used today?	*Key vocabulary:* *air bleed valve, blend door, blower motor, cabin air filter, coolant, compressor, condenser, evaporator, heater core, HVAC system, performance test, pressure tank, radiator, radiator fan, refractometer, refrigerant, thermostat, water pump*	
What are the main components of the cooling system?		
What are the main components of the HVAC system?		
What is the process of removing and reinstalling a theromstat in a vehicle?		
How is the blend door operated on a vehicle?		
How does a AC system operate on a vehicle?		

UNIT 14: VEHICLE MAINTENANCE		
STAGE 1: Desired Unit Results *What will students understand as a result of the unit?*		**STAGE 2: Assessment Evidence** *By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?*
ESSENTIAL QUESTION (s) *What thought-provoking questions will foster inquiry, understanding, and transfer of learning?*		**Success Criteria with Standards** *The criteria for evaluating performance on standards is constant.*
What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?		CTE standards-based Rubric: Throughout course, students and teachers use rubric for communication of success criteria, reflection, goal setting, and feedback.
How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?		Students continually reflect on and discuss essential questions in their notebook and orally in class.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		*Performance assessments: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include lab reports/ portfolios, performance tests, demonstrations and employability review. All labs will be assessed using the rubric provided by NATEF (National Automotive Technicians Education Foundation).* *Other assessments may include:* *Dealership visitations* *oral presentations* *journals* *self & peer assessment tools (rubric/checklists rating scales)* *demonstrations* *paper-and-pencil tests* *laboratory reports* *portfolio analysis* *ASE Certification test*
a: I develop effective resolutions for a given problem, decision or opportunity using available information.	4C2.a.11.h: I can determine the information needed to address an identified problem.	
	4C2.a.15.h: I can determine the best resolution for a problem, decision or opportunity based on given criteria.	
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.5.h: I can participate in cocurricular and community activities to enhance the school experience.	
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
a: I choose appropriate sources of data and information for a given purpose.	IMT1.a.6.h: I can justify the selection of various information sources for a given purpose.	
b: I determine the relevance, validity and timeliness of data and information.		
	IMT1.b.8.h: I can compare and contrast validity of information from electronic and non-electronic sources.	
c: I select relevant information necessary for making decisions and solving problems		
	IMT1.c.6.h: I can interpret and select appropriate information to develop a resolution for a given situation.	
d: I apply data and information to communicate ideas and create new opportunities.		
	IMT1.d.8.h: I can manage and share stored data and information for a specific purpose.	
PRIORITY CONTENT STANDARDS & Learning Targets		
Standard: BB1: Students will analyze the core concepts of technology.	**BB1.a.5.h:** I can describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.	
Standard: ENG3: Students will demonstrate and analyze the role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	**ENG3.a.5.h:** I can explain technological problems must be researched before they can be solved.	
SUPPORTING STANDARDS AND LEARNING TARGETS		**Performance Tasks Options/ Assessment Strategies by Standard** *Students may be given options to show their learning in varied ways.*
Standard TR1: Students will be able to select and use transportation technologies.	*I can ...* *Interpret vehicle maintenance schedules and indicator displays.* *Review vehicle service history. (HAFEF RST SERVICE #4)* *Locate technical service bulletins (TSBs) and other service information. (NATEF MLR 1-8.A.1)* *Inspect and service engine collant. (NATEF MLR 1.C.4)*	
Stage 3: Learning Activities *A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?*		
GUIDING UNIT QUESTIONS *Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning*	**STRATEGIES/ACTIVITIES** *What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.*	**RESOURCES/MATERIALS** *This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.*
Why is it important that the correct engine oil is installed?	*Key vocabulary:* *ACEA standards, air filter, American Petroleum Institute (API), diesel exhaust fluid (DEF), hybrid organic acid technology (HOAT), ILSAC, maintenance, maintenance reminder, multiviscosity oils, organic acid technology (OAT), severe service, Society of Automotive Engineers (SAE)*	
How is booking time configured?		
Why would TSBs be usefull when trouble-shoot a problem on a vehicle?		
What is preventive mainenance and why would it save the customer money?		
How does a electronic maintenance reminder system work on todays vehicles?		
What is cross contamination and what problems could it lead too?		