

**ELECTRIC VEHICLE TECHNOLOGY #7409
COURSE OUTLINE**

Unit / Competency	Unit Title / Competency Description	Unit %	Competency %
A.	COURSE OVERVIEW		
001.	Demonstrate an understanding of the course.	1%	1%
B.	LEADERSHIP DEVELOPMENT		
002.	Demonstrate individual, school, and community leadership skills.	5%	5%
C.	ORIENTATION TO ELECTRIC AND ALTERNATIVE FUELED VEHICLES		
003.	Demonstrate a basic understanding of electric vehicles.	28%	5%
004.	Demonstrate a basic understanding of the environmental, social and technological forces that led to a resurgence of electric vehicles.		6%
005.	Use a small-scale model EV to demonstrate basic scientific and technical concepts.		17%
D.	SHOP PREPAREDNESS		
006.	Identify and understand rules and procedures for safe use of shop equipment and materials.	14%	8%
007.	Identify and demonstrate the safe use of tools used in EV service.		6%
E.	EV COMPONENTS		
008.	Identify and demonstrate an understanding of the function of EV components.	12%	7%
009.	Demonstrate an understanding of basic EV maintenance and troubleshooting.		5%
F.	PRODUCT DEVELOPMENT		
010.	Design, produce and present an EV-related product.	40%	40%
		100%	100%

TRADE AND INDUSTRIAL EDUCATION
COURSE BLUEPRINT for 7409 ELECTRIC VEHICLE TECHNOLOGY
 (Recommended hours of instruction: 135 - 180)

Comp. # Obj. #	Unit Titles / Competency and Objective Statements (The student will be able to:)	Time Hrs.	Cog	Perf	Type Behavior	Integrated Skill Area	Core Supp
1	2 ELECTRIC VEHICLE TECHNOLOGY	3	4 37%	5 63%	6	7	8
A.	COURSE OVERVIEW						
001.	Demonstrate an understanding of the course.		1%	0%	C1	C	Core
001.01	Review course syllabus, goals, grading and course expectations.		1%		C1	C	Core
B.	LEADERSHIP DEVELOPMENT						
002.	Demonstrate individual, school, and community leadership skills.		2%	3%	C1C3PA	C	Core
002.01	Understand the basic techniques of parliamentary procedure.		1%		C1	C	Core
002.02	Understand the steps for processing a motion and the methods of voting.		1%		C3PA	C	Core
002.03	Demonstrate an understanding of successful teamwork skills through team-building activities.			1%	C3PA	C	Core
002.04	Identify and demonstrate effective public presentation skills.			1%	C3A	C	Core
002.05	Learn about leadership skills through interacting with and interviewing members of a Community Support Team.			1%	C3A	C	Core
C.	ORIENTATION TO ELECTRIC AND ALTERNATIVE FUELED VEHICLES						
003.	Demonstrate a basic understanding of electric vehicles.		15%	13%	C1	C/SC	Core
003.01	Identify the basic components of an electric vehicle.		4%	1%	C1	SC	Core
003.02	Demonstrate a basic understanding of the main differences between an electric vehicle and an internal combustion vehicle.		1%	1%	C1	SC	Core
003.03	Compare other alternative fueled vehicles to electric and internal combustion vehicles.		1%		C1	SC	Core
003.04	Demonstrate a basic understanding of electric vehicle history.		1%				
003.05	Research and develop an understanding of the career opportunities in the alternative-fueled vehicle industry.		1%		C1	C	Core

Comp. # Obj. #	Unit Titles / Competency and Objective Statements (The student will be able to:)	Time Hrs.	Cog	Perf	Type Behavior	Integrated Skill Area	Core Supp
004.	Demonstrate a basic understanding of the environmental, social and technological forces that led to a resurgence of electric vehicles.		3%	3%	C1C3P	C/SC/SS/M	Core
004.01	Indicate a basic understanding of how environmental issues have influenced the recent growth of electric vehicles and other sustainable technologies.		1%		C1	SC	Core
004.02	Calculate the emissions of an internal combustion vehicle and compare to EVs.			1%	C3	SC/M	Core
004.03	Demonstrate a basic understanding of how government mandates have spurred the growth of electric vehicle technology.		1%		C1	SS	Core
004.04	Demonstrate a basic understanding of how solid-state technologies have influenced the electric vehicle industry and society.		1%		C1	SS	Core
004.05	Conduct research and create a public presentation on current EV technology and industry developments.			2%	C3P	C	Core
005.	Use a small-scale model EV to demonstrate basic scientific and technical concepts.		8%	9%	C3P	SC/M	Core
005.01	Construct a small-scale model EV and demonstrate a basic understanding of the scientific concepts of battery, motor, charger, and controller function.		1%	3%	C3P	SC	Core
005.02	Use a multimeter to demonstrate a basic understanding of the electrical concepts of parallel and series circuits, Ohm's law, and electrical units.		1%	2%	C3P	SC	Core
005.03	Read and draw a basic wiring diagram.		1%	1%	C3P	SC	Core
005.04	Demonstrate a basic understanding of/relationship between magnetism and electricity.		1%		C3P	SC	Core
005.05	Calculate and understand the relationship between torque and gear ratios.		1%		C3P	SC	Core
005.06	Show a basic understanding of energy concepts, conservation of energy and energy conversions.		1%		C3	SC	Core
005.07	Calculate vehicle dynamics using basic laws of motion.		1%	1%	C3	SC	Core
005.08	Successfully use mathematics to demonstrate the above scientific concepts.		1%	2%	C3	M	Core
D.	SHOP PREPAREDNESS		7%	7%			
006.	Identify and understand rules and procedures for safe use of shop equipment and materials.		4%	4%	C1A	H	Core
006.01	Identify and understand personal and general shop safety rules and complete a shop safety pledge.		1%	1%	C1A	H	Core
006.02	Demonstrate an understanding of safety issues and accident response regarding batteries and electricity.		1%	1%	C1A	H	Core
006.03	Demonstrate an understanding of preventative safety practices when working on an electric vehicle.		1%	1%	C1A	H	Core
006.04	Identify and understand the classes of fires and methods used to extinguish them.		1%	1%	C1A	H	Core

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007.	Identify and demonstrate the safe use of tools used in EV service.		3%	3%	C3PA	H	Core
007.01	Demonstrate an understanding of the safe use of general hand and power tools used in EV service.		1%	1%	C3PA	H	Core
007.02	Demonstrate an understanding of the safe use of basic battery service tools.		1%	1%	C3PA	H	Core
007.03	Demonstrate an understanding of the safe use of basic electrical service tools.		1%	1%	C3PA	H	Core
E.	EV COMPONENTS		2%	10%			
008.	Identify and demonstrate an understanding of the function of EV		1%	6%	C1C3A	SC/H	Core
008.01	Demonstrate a basic understanding of how the main components of an EV work together.			1%	C3A	SC	Core
008.02	Explain the basic operation of electric vehicle components such as the motor, controller, batteries, charger, contactor and 12-volt system.			3%	C3A	SC	Core
008.03	Demonstrate the electrical safety features of an electric vehicle.			1%	C3A	H	Core
008.04	Identify basic electronic components and explain their function.		1%	1%	C1A	SC	Core
009.	Demonstrate an understanding of basic EV maintenance and troubleshooting.		1%	4%	C3PA	SC/H	Core
009.01	Demonstrate an understanding of safe battery maintenance.			1%	C3A	H	Core
009.02	Demonstrate an understanding of safe electrical system maintenance.			1%	C3A	H	Core
009.03	Troubleshoot the electrical system of an EV.		1%	2%	C3P	SC	Core
F.	PRODUCT DEVELOPMENT		10%	30%			
010.	Design, produce and present an EV-related product.		10%	30%	C3PA	C/SC/M	Core
010.01	Demonstrate an understanding of and use a simple rubric for product assessment.		1%	1%	C3	C/SC	Core
010.02	Design an EV-related product.		3%	5%	C3P	SC	Core
010.03	Produce an EV-related product.		5%	20%	C3P	SC/M	Core
010.04	Produce a written report and oral presentation for a school or community group that includes a demonstration of the scientific and technical principles supporting an EV-related product.		1%	4%	C3A	C/SC	Core