

**APPROVED
PATHWAY:**

- Includes minimum of three secondary-level credits.
- Includes a work-based element.
- Consists of a sequence:
 - Introductory-level.
 - Technical-level.
 - Application-level courses.
- Supporting documentation includes Articulation Agreement(s), Certification, Program Improvement Plan and a Program of Study.
- Technical-level and Application-level courses receive .5 state-weighted funding in an approved CTE pathway.



TRANSPORTATION CAREER CLUSTER DESIGN

Mobile Equipment Maintenance Pathway

CIP CODE 47.9999

Automotive Technology Strands

INTRODUCTORY LEVEL

Must choose **ONE** of the boxed courses.

Title	Code	Credit
* Introduction to Industrial Technology	38001	.5 credit
* Introduction to Transportation	40100	.5 credit

Title	Code	Credit
Automotive Information	40050	.5 credit
Business Essentials	12050	.5 credit

TECHNICAL LEVEL

Title	Code	Credit
Alternative Power	40210	.5 credit
Small Engines & Powertrains I	40212	.5 credit
Engine Mechanical Repair	40216	.5 credit
Diesel Engine Technology	40218	.5 credit
^ Entrepreneurship	12053	.5 credit

Title	Code	Credit
Strand One		
General Service I	40150	1 credit
Strand Two		
Electronic & Electrical Systems I	40200	1 credit
Brakes I	40204	.5 credit
Drive Train Technology	40208	.5 credit
Engine Performance I	40220	.5 credit
Steering & Suspension I	40224	.5 credit
Mobile HVAC	40228	.5 credit

APPLICATION LEVEL

Must choose **ONE** of the boxed courses.

Title	Code	Credit
*** Work Experience in Transportation	40250	.5 credit
*** Work Experience in Transportation Comprehensive	40251	1 credit
** Small Engines & Powertrains II	40214	.5 credit

Strand One

Title	Code	Credit
**General Service II	40152	1 credit
**General Service III	40154	1 credit

Strand Two

Title	Code	Credit
** Electronics & Electrical Systems II	40202	1 credit
** Brakes II	40206	.5 credit
** Engine Performance II	40222	1 credit
** Steering & Suspension II	40226	.5 credit

^ Will not count as one of the 3 required secondary level credits for pathway approval. Will count as a funded course.

* One of these two courses is required for pathway approval.

** Has a specific prerequisite course(s) - See Competency Profile for details.

*** Has prerequisites - Must take at least 1.0 credit of Technical level course and Application level course combined.

KANSAS STATE CAREER CLUSTER COMPETENCY PROFILE FOR: TRANSPORTATION CLUSTER PATHWAYS

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

- 4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
- 3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
- 2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
- 1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
- 0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

COMMON CAREER TECHNICAL CORE – Career Ready Standards (To be taught throughout the pathway.) www.careertech.org		4	3	2	1	0
1.	Act as a responsible and contributing citizen and employee.					
2.	Apply appropriate academic and technical skills.					
3.	Attend to personal health and financial well-being.					
4.	Communicate clearly, effectively and with reason.					
5.	Consider the environmental, social, and economic impacts of decisions.					
6.	Demonstrate creativity and innovation.					
7.	Employ valid and reliable research strategies.					
8.	Utilize critical thinking to make sense of problems and persevere in solving them.					
9.	Model integrity, ethical leadership, and effective management					
10.	Plan education and career path aligned to personal goals.					
11.	Use technology to enhance productivity.					
12.	Work productively in teams while using cultural/global competence.					

COMMON CAREER TECHNICAL CORE – Transportation Cluster Standards (To be taught throughout the pathway.) www.careertech.org		4	3	2	1	0
1.	Describe the nature and scope of the Transportation, Distribution & Logistics.					
2.	Career Cluster and the role of transportation, distribution and logistics in society and the economy.					
3.	Describe the application and use of new and emerging advanced techniques to provide solutions for transportation, distribution, and logistics problems.					
4.	Describe the key operational activities required of successful transportation, distribution, and logistics facilities.					
5.	Identify governmental policies and procedures for transportation, distribution, and logistics facilities.					
6.	Describe transportation, distribution and logistics employee rights and responsibilities and employers' obligations concerning occupational safety and health.					
7.	Describe career opportunities and means to achieve those opportunities in each of the Transportation, Distribution & Logistics Career Pathways.					
8.	Develop preventative maintenance plans and systems to keep facility and mobile equipment inventory in operation.					
9.	Design ways to improve facility and equipment system performance.					

Kansas Architecture & Construction Cluster

Course:	Introduction to Industrial Technology	Course #:	38001	Credit:	.5
Pathways & CIP Codes:	Aviation Maintenance (47.0608) Aviation Production (15.0000) Construction & Design (46.0000) Manufacturing (48.0000) Mobile Equipment Maintenance (47.9999)	Strand(s):	Avionics & Airframe Production & Maintenance Construction & Design Design & Production Auto Collision & Technology	Level:	Introduction
Course Description:	An introductory level course designed to instruct students in the basic skills necessary to all occupations in the Construction, Manufacturing, and Transportation career clusters.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Basic Safety		4	3	2	1	0
1.1	Identify causes of accidents and the impact of accident costs.					
1.2	Follow safe behavior procedures on and around ladders, scaffolds and stairs.					
1.3	Follow safe behavior procedures around electrical hazards.					
1.4	Demonstrate the use, care and inspection of appropriate personal protective equipment (PPE).					
1.5	Explain the importance of hazard communications (HazCom) and material safety data sheets (MSDSs).					
1.6	Respond to hazardous-materials and hazardous-waste emergency situations in accordance with regulatory requirements.					
1.7	Follow safety procedures required for lifting heavy objects.					
1.8	Demonstrate a working knowledge of safety education, environment, and enforcement for life and work.					
1.9	Apply safe practices while using tools and equipment.					
1.10	Apply safe practices for housekeeping, dress, fire, chemicals & personal protection while working in a shop.					
1.11	Describe fire prevention and firefighting techniques.					

1.12	Explain the purpose of OSHA and how it promotes safety on the job.					
------	--------------------------------------------------------------------	--	--	--	--	--

Benchmark 2.0: Industrial Math		4	3	2	1	0
2.1	Add, subtract, multiply, and divide whole numbers, fractions, decimals and percentages.					
2.2	Use a standard ruler, a metric ruler, and a measuring tape to measure.					
2.3	Demonstrate conversion skills for decimals and fractions.					
2.4	Recognize and perform calculations using metric units of length, weight, volume and temperature.					

Benchmark 3.0: Hand Tools		4	3	2	1	0
3.1	Recognize and identify some of the basic hand tools and their proper uses in industrial trades.					
3.2	Demonstrate the safe use of common hand tools.					

Benchmark 4.0: Power Tools		4	3	2	1	0
4.1	Recognize and identify some of the basic power tools and their proper uses in the industrial trades.					
4.2	Demonstrate the safe use of common power tools.					
4.3	Perform preventive maintenance on basic power tools used in the industrial trades.					

Benchmark 5.0: Blueprint Reading		4	3	2	1	0
5.1	Perform the drafting principles needed to draw the basic geometric shapes.					
5.2	Develop a pictorial sketch of an object.					
5.3	Develop a multi-view drawing.					
5.4	Identify basic symbols used in blueprints.					
5.5	Identify various types of blueprint views used in Architecture and Construction, Engineering, Manufacturing, and Transportation.					

Benchmark 6.0: Communication Skills		4	3	2	1	0
6.1	Interpret information and follow instructions presented in both verbal and written form.					
6.2	Communicate effectively in on-the-job situations using verbal and written skills in various delivery modes (face-to-face, paper, & electronic).					
6.3	Create and complete various written documents used in industrial trades.					
6.4	Demonstrate knowledge and use of computer systems and word processing software in effective communication.					

Benchmark 7.0: Employability Skills		4	3	2	1	0
-------------------------------------	--	---	---	---	---	---

7.1	Create and utilize employment documents including a resume and portfolio.					
7.2	Demonstrate job seeking and interview skills.					
7.3	Understand and respond to performance reviews.					

Benchmark 8.0: 21 st Century/Foundation Skills		4	3	2	1	0
8.1	Demonstrate critical thinking skills and the ability to solve problems using those skills.					
8.2	Define effective relationship skills.					
8.3	Demonstrate a working knowledge of workplace issues such as sexual harassment, stress, and substance abuse.					
8.4	Demonstrate the ability to achieve common goals through team work.					

Benchmark 9.0: Materials Handling		4	3	2	1	0
9.1	Verify that health, safety, environmental, and government regulations are met.					
9.2	Recognize hazards and follow safety procedures required for materials handling.					
9.3	Demonstrate ability to load and unload materials properly and safely.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Introduction to Transportation	Course #:	40100	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Collision Auto Technology – One & Two	Level:	Introductory
Course Description:	This course gives students an overview of the transportation industry skills and career opportunities, as well as the education required to acquire each career.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

- 4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
- 3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
- 2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
- 1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
- 0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Competencies:		4	3	2	1	0
1.1	Explain basic principles of automotive systems and repair.					
1.2	Explain basic principles of collision repair and techniques.					
1.3	Explain basic principles of refinishing and coatings.					
1.4	Explain basic principles of small engine and powersport repair.					
1.5	Explain basic principles of repairing vehicle interiors.					
1.6	Explain basic knowledge of custom vehicle parts, applications, and modifications.					
1.7	Explain basic knowledge of alternative fuels and transportation sources.					
1.8	Explain basic principles of diesel and heavy equipment maintenance and/or repair.					
1.9	Research and explore career and educational opportunities in transportation.					
1.10	Explain basic principles of safety and tools recognized in the transportation industry.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Automotive Information	Course #:	40050	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Collision Auto Technology – One & Two	Level:	Introductory
Course Description:	<p>Provides students with the opportunity to learn practical car maintenance skills. Students will attain basic skills and knowledge needed to own and maintain a vehicle. The students will learn what to consider when buying a car, shopping for car insurance, acquiring a title, etc.</p> <p><i>(May be offered as a supplemental course in this pathway. This course will count toward 3 minimum high school credits required for pathway approval if taught at the high school level. It will not count as the ONLY Introductory course for this pathway.)</i></p>				

Directions: The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Automotive Safety and Tools		4	3	2	1	0
1.1	Identifying and safely use automotive tools and equipment.					

Benchmark 2.0: Electrical Systems		4	3	2	1	0
2.1	Check and clean battery terminals, jump start a vehicle, change fuses, headlights, and taillights.					

Benchmark 3.0: Powertrain and Chassis		4	3	2	1	0
3.1	Identify parts and components.					
3.2	Identify noises.					

Benchmark 4.0: Brake Systems		4	3	2	1	0
4.1	Identify and inspect brake systems components.					

Benchmark 5.0: Engine Performance		4	3	2	1	0
5.1	Identify idle quality, or engine misfire concerns.					

Benchmark 6.0: Tires & Steering Alignment		4	3	2	1	0
6.1	Inspect tire wear and condition.					
6.2	Find correct tire inflation information.					
6.3	Check tire air pressure.					
6.4	Identify and recognize procedures related to relearning tire pressure monitoring systems.					
6.5	Change a tire and/or properly rotate tires.					
6.6	Identify concerns that relate to tire balance.					
6.7	Visually check for alignment problems.					

Benchmark 7.0: Fluids		4	3	2	1	0
7.1	Check, identify, and fill fluids, including engine, transmission, brake, power steering, washer, and coolant.					

Benchmark 8.0: How to Buy a Car		4	3	2	1	0
8.1	Conduct research on vehicle insurance, titles, taxes, mechanical condition, and appearance as it applies to buying a vehicle.					

Benchmark 9.0: Recommended Maintenance		4	3	2	1	0
9.1	Demonstrate knowledge of fluids, timing belt, filters, etc. service intervals - including where this information can be found.					

Benchmark 10.0: Vehicle Upkeep - Interior and Exterior		4	3	2	1	0
10.1	Maintain the interior and exterior of their vehicle to keep it in the best condition.					

Name: _____ ID: _____

Instructor: _____ School Year: _____

Enrollment Date	Completion Date	Credits Completed
____/____/____	____/____/____	____/____/____

I certify that the student received the training in the area indicated.

Student Signature: _____ Date: _____

Instructor Signature: _____ Date: _____

Introductory Level Course
This is a core course designed to give students an overview of the business, marketing and finance career cluster occupations. Students will develop an understanding of how academic skills in mathematics, economics, and written and oral communications are integral components of success in these occupations. Students will examine current events to determine their impact on business and industry and legal and ethical behavior, acquire knowledge of safe and secure environmental controls to enhance productivity, determine how resources should be managed to achieve company goals, and identify employability and personal skills needed to obtain a career and be successful in the workplace. As students learn about different types of business ownership, they will interpret industry laws and regulations to ensure compliance, identify principles of business management, and analyze business practices to determine ethics and social responsibilities.

Rating Scale: 4 - Exemplary Achievement 3 - Proficient Achievement
2 - Limited Achievement 1 - Inadequate Achievement 0 - No Exposure

Topic	1		
Benchmark	1.0		
		Competencies	Sample Indicators
	1.1	Analyze fundamental economic concepts necessary for employment in business.	Distinguish between economic goods and services. <div>43210</div>
			Explain the concept of economic resources. <div></div>
			Describe the concepts of economics and economic activities. <div></div>
			Determine economic utilities created by business activities. <div></div>
			Explain the principles of supply and demand. <div></div>
			Describe the functions of prices in markets. <div></div>

	1.2	Describe the nature of business and its contribution to society.	Explain the role of business in society.	4	3	2	1	0
			Describe types of business activities.					
			Explain the organizational design of businesses.					
			Discuss the global environment in which businesses operate.					
			Describe factors that affect the business environment.					
			Explain how organizations adapt to today's markets.					
	1.3	Recognize how economic systems influence environments in which businesses function.	Explain the types of economic systems.	4	3	2	1	0
			Explain the concept of private enterprise.					
			Identify factors affecting a business's profit.					
			Determine factors affecting business risk.					
			Explain the concept of competitions.					
			Describe market structures.					
	1.4	Analyze cost/profit relationships to guide business decision-making.	Explain the concept of productivity.	4	3	2	1	0
			Analyze impact of specialization/division of labor on productivity.					
			Explain the concept of organized labor and business.					
			Explain the impact of the law of diminishing returns.					
			Describe the concept of economies of scale.					

	1.5	Describe the purpose and origin of business within the U.S.	Discuss the various commodities of trade within US history.	4	3	2	1	0
			Explain the origins of Wall Street.					
			Describe the evolution in consumer awareness and buyer relationships.					
			Explain the concept of Gross Domestic Product and its development with the U.S.					
	1.6	Analyze the history and importance of trade within a global marketplace.	Difference between imports and exports.	4	3	2	1	0
			Explain the role of cultures and political systems on global trade.					
			Explain the currency exchanges and how the value fluctuates.					
	1.7	Apply verbal skills when obtaining and conveying information.	Participate in group discussions.	4	3	2	1	0
			Demonstrate open listening when cultivating relationships.					
			Share thoughts respectfully while being direct.					
	1.8	Compose internal and external multi-paragraph documents clearly, succinctly, and accurately to convey and obtain information.	Prepare simple written correspondence (cover letters, memorandums, resumes).	4	3	2	1	0
			Identify the elements of effective written communications.					
			Use appropriate etiquette in written communications.					
			Write analytical reports (i.e., reports that examine a problem/issue and recommend an action.)					
			Write research reports.					
			Develop and deliver formal and informal presentations using appropriate media to engage					

	1.9	Prepare oral presentations to provide information for specific purposes and audiences.	Organize information effectively.	4	3	2	1	0
			Select and use appropriate graphic aids.					
			Make oral presentations.					
			Describe business's responsibility to know and abide by laws and regulations that affect business					
	1.10	Describe the nature of legally binding business contracts.	Identify the basic torts relating to business enterprises.	4	3	2	1	0
			Describe the nature of legally binding contracts.					
			Understand the civil foundations of the legal requirements of business to demonstrate					
	1.11	Identify regulatory agencies and regulatory legislation.	Describe the nature of legal procedure.	4	3	2	1	0
			Discuss the nature of debtor-creditor relationships.					
			Explain the nature of agency relationships.					
			Discuss the nature of environmental law.					
			Discuss the role of administrative law.					
	1.12	Identify types of business ownership.	Explain types of business ownership.	4	3	2	1	0
			Select form of business ownership.					
Topic	2							
Benchmark	2.0	Technical Skills: Use the technical knowledge and skills required to pursue the targeted careers for all pathways in the career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.						

		Competencies	Sample Indicators				
		Perform customer service activities to support customer relationships and encourage repeat business.	Explain a customer-service mindset.				
	2.1			4	3	2	1
			Respond to customer inquiries and complaints.				
			Interpret business policies to customers/clients.				
			Understands the techniques and strategies used to foster positive-ongoing relationships with				
	2.2	Utilize technology to facilitate customer relationship management.	Understand the nature of customer relationship management.	4	3	2	1
Topic	3						
Benchmark	3.0	EMOTIONAL INTELLIGENCE: Employ and manage techniques, strategies, and systems used by management to foster self-understanding and enhance business relationships					
		Competencies	Sample Indicators				
		Demonstrate managerial and business ethics.	Discuss ethics, responsibility, honesty, integrity, and work habits.	4	3	2	1
	3.1						
	3.2	Develop personal traits and behaviors to foster career advancement.	Identify desirable personality traits important to business.	4	3	2	1
			Exhibit a positive attitude.				
			Exhibit self-confidence.				
			Demonstrate interest and enthusiasm.				
			Demonstrate initiative.				
			Foster positive working relationships.				
			Participate as a team member.				

			Explain the nature of effective communications.					
Topic	4							
Benchmark	4.0	ENTREPRENEURSHIP: Assess entrepreneurship/small-business management-career information to enhance opportunities for career success.						
		Competencies	Sample Indicators					
	4.1	Analyze entrepreneur careers to determine careers of interest.	Discuss entrepreneurial discovery processes.	4	3	2	1	0
			Describe entrepreneurial planning considerations.					
			Explain the need for entrepreneurial discovery.					
			Assess global trends and opportunities for business ventures.					
	4.2	Compare individual's abilities, interests, and attitudes with those associated with entrepreneurial success to determine the match between the two.	Analyze desired lifestyle associated with entrepreneurship.	4	3	2	1	0
			Discern between desired benefits and those associated with entrepreneurship.					
			Research current business issues and entrepreneurs (e.g., Donald Trump, Martha Stewart, Mark Zuckerberg, Magic Johnson, etc.)					
			Contrast personal characteristics with those associated with entrepreneurial success.					
			Examine similarities and differences between personal educational goals and educational requirements for entrepreneurship.					
Topic	5							

Benchmark	5.0	FINANCIAL ANALYSIS: Understand how to maintain, monitor, plan, and control the use of financial resources to protect an entrepreneur and business’s fiscal well-being.						
		Competencies	Sample Indicators					
	5.1	Analyze how proper management of personal finance relates with maintaining business financial efficiency.	Explain forms of financial exchange.	4	3	2	1	0
			Manage personal finances to achieve financial goals with savings and investing.					
			Identify a business’s risks.					
			Explain the time value of money.					
			Explain the purposes and importance of credit.					
	5.2	Define the accounting equation and how accounting can assist in maintaining financial solvency.	Interpret cash-flow statements.	4	3	2	1	0
			Monitor business’s profitability.					
			Develop personal budget.					
			Properly maintain a personal financial account (e.g., savings, checking, etc.)					
			Interpret a pay stub.					
			Read and reconcile bank statements.					
			Maintain financial records.					
			Describe sources of income (e.g., wages/salaries, interest, rent, dividends, transfer payments, etc.)					

Topic	6										
Benchmark	6.0	INFORMATION TECHNOLOGY APPLICATIONS: Use information technology tools specific to the career cluster to access, manage, integrate, and create information.									
		Competencies	Sample Indicators								
	6.1	Use information technology tools to manage and perform work responsibilities.	Assess information needs.					4	3	2	1
			Use information literacy skills to increase workplace efficiency and effectiveness.								0
			Identify ways that technology impacts business.								
			Explain the role of information systems.								
			Operate writing and publishing applications to prepare business communications.								
	6.2	Prepare simple documents and other business communications.	Demonstrate basic research skills.					4	3	2	1
			Evaluate quality and source of information.								0
Topic	7										
Benchmark	7.0	MARKETING: Manage marketing activities to facilitate business development and growth.									
		Competencies	Sample Indicators								
	7.1	Understand marketing's role and function in business to facilitate economic exchanges with customers.	Plan product mix.					4	3	2	1
			Determine services to provide customers.								0
			Explain the role of customer service in positioning/image.								
			Analyze factors that contribute to business success.								

			Develop strategies to position product/business.					
			Acquire foundational knowledge of customer, client, and business behavior to understand what motivates decision-making.					
	7.2	Explain marketing and its importance in global economy.	Identify considerations in implementing international marketing strategies.	4	3	2	1	0
	7.3	Describe marketing functions and related activities.	Identify elements of the marketing mix.	4	3	2	1	0
Topic	8							
Benchmark	8.0	EMPLOYABILITY AND CAREER DEVELOPMENT: Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills. Explore, obtain, and develop strategies for ensuring a successful business career.						
		Competencies	Sample Indicators					
	8.1	Develop personal traits and behaviors to foster career advancement.	Discuss appropriate personal appearance.	4	3	2	1	0
			Explain the importance of having a vision through properly setting personal short, mid and long-term goals.					
			Conduct mock interviews using local business representatives as interviewers.					
			Use time-management skills.					
	8.2	Identify the impact business has on local communities.	Invite guest speakers from represented modules (e.g., accountant, banker, marketer, etc.) to speak	4	3	2	1	0
			Tour a large business in the local community.					
			Tour a small business in the local community.					
	8.3	List the standards and qualifications that must be met in career.	Prepare a resume.	4	3	2	1	0

			Prepare a letter of application.					
			Complete an employment application.					
			Interview for employment.					
	8.4	Utilize critical thinking and decision-making skills to exhibit qualifications to a potential employer.	Demonstrate problem-solving skills.	4	3	2	1	0
			Obtain needed information efficiently					
			Evaluate quality and source of information.					
			Apply information to accomplish a task.					
	8.5	Demonstrate project-management skills.		4	3	2	1	0
	8.6	Demonstrate employability/career success skills.	Place artifacts that demonstrate employability/career success skills in the electronic portfolio section of the IPS (Individual Plan of Study).	4	3	2	1	0

Kansas Transportation, Distribution and Logistics Cluster

Course:	Alternative Power	Course #:	40210	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Technology – One & Two	Level:	Technical
Course Description:	A technical level course designed to provide students with basic theories and information needed to develop an understanding of alternative power used in vehicles.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Shop Operations and Safety		4	3	2	1	0
1.1	Identify and retrieve sources of service information.					
1.2	Identify and demonstrate safe shop procedures, including safe operation of tools.					
1.3	Demonstrate knowledge of chemical safety, including proper handling and disposal of hazardous materials.					
1.4	Demonstrate proper use of PPE (Personal Protective Equipment).					

Benchmark 2.0: Hybrid Technology		4	3	2	1	0
2.1	Recognize various hybrid technologies.					
2.2	Discuss principles of power flow in hybrid transmissions.					
2.3	Discuss principles of regenerative braking.					
2.4	Compare impact on vehicle emissions from hybrid technologies.					

Benchmark 3.0: Flexible Fuel Vehicles		4	3	2	1	0
3.1	Describe/Explain FFV principles of flexible fuel production.					

Benchmark 4.0: Electric Vehicles		4	3	2	1	0
4.1	Explain principles of energy production (fossil fuel, solar, hydro, wind, and nuclear) and power storage.					
4.2	Describe/Explain electrical motor principles.					
4.3	Describe/Explain production and characteristics of batteries used in electric vehicles.					

Benchmark 5.0: Hydrogen and Fuel Cell Vehicles		4	3	2	1	0
5.1	Describe/Explain principles of production, distribution and storage of hydrogen.					
5.2	Describe/Explain fuel cell technology.					
5.3	Describe/Explain usage of hydrogen in internal combustion.					

Benchmark 6.0: Emerging Trends		4	3	2	1	0
6.1	Research and report on future and emerging trends in alternative and green power.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Small Engines and Powertrains I	Course #:	40212	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Technology – One & Two	Level:	Technical
Course Description:	A comprehensive, technical level course to instruct students in the knowledge and skills common to all small engine operations and repair.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Demonstrate and apply safe working practices with tools and machines.					
1.2	Identify and follow safety procedures as outlined in OSHA guidelines.					
1.3	Identify, service needs, and maintain the working parts of 2- and 4-stroke cycle engines.					
1.4	Explain and demonstrate a working knowledge of engine systems on 2- and 4-stroke cycle engines.					
1.5	Utilize precision measuring equipment.					
1.6	Use and interpret service literature.					
1.7	Demonstrate an understanding of primary drive mechanisms.					
1.8	Demonstrate the ability to perform a leak inspection.					
1.9	Demonstrate the ability to disassemble and reassemble an engine.					
1.10	Remove and install an engine.					
1.11	Compare and contrast various types of transmissions and drive systems.					
1.12	Explain the principles of electricity as they pertain to small engines and powertrains.					
1.13	Interpret and follow reference manuals, schematics, diagrams, flow charts, symbols, and technical procedures.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Engine Mechanical Repair	Course #:	40216	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Technology – One & Two	Level:	Technical
Course Description:	A technical level course that covers the tools, skills, and techniques required to perform base engine mechanical repair and testing. This includes engine removal, installation, and maintenance.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Correctly identify the parts and describe the operation of an internal combustion engine (diesel, gas, 2-stroke, 4-stroke).					
1.2	Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.					
1.3	Disassemble and reassemble an internal combustion engine correctly, including finding engine torque and assembly specifications. This may be done in modules. (Example: Cylinder Head Gasket, valve train, and crankshaft).					
1.4	Identify and safely use and maintain the tools needed to perform mechanical repairs, including precision measurement tools.					
1.5	Identify the machining processes involved with engine mechanical repair.					
1.6	Clean and inspect engine parts to determine their quality and usability, including magna-fluxing and dye testing.					
1.7	Demonstrate knowledge of the removal and installation of an engine.					
1.8	Inspect, repair, or service cooling and lubrication system components.					
1.9	Demonstrate knowledge of broken fastener and thread repair techniques.					
1.10	Demonstrate knowledge of the various types of gaskets, sealers, and thread lockers and their usages.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Diesel Engine Technology	Course #:	40218	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Technology – One & Two	Level:	Technical
Course Description:	A comprehensive, technical level course to instruct students in the knowledge and skills common to diesel engine operations.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

- 4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
- 3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
- 2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
- 1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
- 0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Correctly identify and describe the parts of a diesel internal combustion engine.					
1.2	Demonstrate knowledge of air induction systems.					
1.3	Demonstrate knowledge of diesel fuel systems.					
1.4	Identify and describe operation of diesel exhaust system.					
1.5	Locate and describe the operation of diesel engine emission devices.					
1.6	Understand and describe diesel engine design and emerging trends.					
1.7	Research applicable diesel engine service information such as fluid types, service bulletins, and service precautions.					

Name: _____ ID: _____

Instructor: _____ School Year: _____

Enrollment Date	Completion Date	Credits Completed
___/___/___	___/___/___	___/___/___

I certify that the student received the training in the area indicated.

Student Signature: _____ Date: _____

Instructor Signature: _____ Date: _____

Technical Level Course

Entrepreneurship courses acquaint students with the knowledge and skills necessary to own and operate their own businesses or the ability to use the entrepreneurial mindset in an existing organization. Topics from several fields typically form the course content: economics, marketing principles, human relations and psychology, business and labor law, legal rights and responsibilities of ownership, business and financial planning, finance and accounting, and communication.

Rating Scale: 4 - Exemplary Achievement 3 - Proficient Achievement
2 - Limited Achievement 1 - Inadequate Achievement 0 - No Exposure

Topic	1					
Benchmark	1.0	Solve mathematical problems and use the information as it relates with entrepreneurship/small business ownership.				
		Competencies	Sample Indicators			
	1.1	Solve mathematical problems using numbers and operat	Recognize relationships among numbers.	4	3	2
			Employ mathematical operations.			
			Perform computations successfully.			
			Predict reasonable estimations.			
	1.2	Incorporate algebraic skills to make business decisions.	Recognize patterns and mathematical relations.	4	3	2
			Use algebraic symbols to represent, solve, and analyze mathematical problems.			

		Create mathematical models from real-life situations.						
		Represent changes in quantities mathematically.						
		Determine rate of change mathematically.						
		Interpret graphical and numerical data.						
1.3	Demonstrate an understanding of how basic economic concepts are utilized by an entrepreneur/small business	Explain the principles of supply and demand.	4	3	2	1	0	
		Explain the factors of production.						
		Explain the concept of scarcity.						
		Explain the concept of opportunity costs.						
1.4	Explain and describe cost/benefit analysis as it explains cost-profit relationships.	Describe cost/benefit analysis.	4	3	2	1	0	
		Analyze the impact of specialization/division of labor on productivity.						
		Explain the concept of organized labor and business.						
		Explain the law of diminishing returns.						
		Describe the concept of economies of scale.						
1.5	Explain and demonstrate the nature of effective communications.	Apply effective listening skills.	4	3	2	1	0	
		Explain the nature of effective verbal communications.						
		Demonstrate effective verbal, written, and digital communications.						
		Make oral presentations.						

			Prepare simple written reports (e.g. cover letters, memorandums, resumes)					
			Use appropriate etiquette in written communications.					
			Use proper grammar and vocabulary.					
	1.6	Describe methods in dealing with conflict as it relates with entrepreneurship/small business ownership.	Explain negotiation skills	4	3	2	1	0
			Describe techniques and importance of handling difficult customers/clients.					
Benchmark	2.0	Describe an entrepreneur's responsibility to know and abide by laws and regulations that affect all individuals involved in the business operations.						
		Competencies	Sample Indicators					
	2.1	Describe the relationship between principled entrepreneurship and personal responsibility.	Understand the civil foundations of the legal environment of business.	4	3	2	1	0
			Explain the difference and similarities between business and consumer rights to operate in a free market system.					
	2.2	Describe the relationship between government and business.	Describe the nature of legal procedures in business.	4	3	2	1	0
			Explain how an entrepreneur can protect its intellectual property rights (i.e., patents, trademarks, copyrights).					
	2.3	Identify types of business ownership.		4	3	2	1	0
	2.4	Demonstrate understanding of managerial and business ethics.	Discuss ethics, responsibility, honesty, integrity, and work habits.	4	3	2	1	0
	2.5	Analyze and define entrepreneurship.	Define entrepreneurship and entrepreneurs.	4	3	2	1	0
			Contrast the expressions of the entrepreneurial mindset (e.g., classic, change agent, intrapreneur), identifying their value and role.					

	2.6	Expound on the importance of entrepreneurship on market economies.	Describe the need for entrepreneurial discovery.	4	3	2	1	0
			Analyze the importance of entrepreneurship to US/global economy.					
	2.7	Explain characteristics of an entrepreneur as it relates to personal assessment and management.	Analyze desired lifestyle and that associated with entrepreneurship.	4	3	2	1	0
			Discern between desired benefits and those associated with entrepreneurship.					
			Examine similarities and differences between personal educational goals and educational requirements for entrepreneurship.					
Benchmark	3.0	Developing and recognizing a successful business venture opportunity through entrepreneurial discovery, concept development, resourcing, actualization and harvesting.						
		Competencies	Sample Indicators					
	3.1	Identify successful methods in developing and assessing innovative business ideas.	Utilize techniques for idea creation.	4	3	2	1	0
			Incorporate innovative thinking methods to meet consumer demands.					
			Identify methods in which technology creates innovation.					
			Use creativity in business activities/decisions.					
	3.2	Give explanation on how entrepreneurs recognize marketplace opportunities.	Assess global trends and opportunities for business ventures.	4	3	2	1	0
			Observe trends in the marketplace.					
	3.3	Explain tools used by entrepreneurs for venture planning.	Assess start-up requirements.	4	3	2	1	0
			Assess risks associated with venture.					
			Describe external resources useful to entrepreneurs during concept development.					

			Use components of a business plan to define venture idea.					
	3.4	Explain proper methods in assessing and calculating risk in developing a business venture.	Select an existing business and identify its initial business risks.	4	3	2	1	0
			Using financial and economic tools (e.g., Break-even, ROI, cost-benefit analysis, etc.) determine a venture's risk threshold (i.e., investing in a new business versus an established franchise).					
			Explain the complexity of business operations.					
			Explain the need for business systems and procedures.					
			Explain methods/processes for organizing work flow.					
			Identify processes for ongoing opportunity recognition.					
			Understand the need for changes in a business environment.					
	3.5	Describe the need for continuation planning as it relates with entrepreneurship/small business ownership.	Describe methods of venture harvesting.	4	3	2	1	0
			Evaluate options for continued venture involvement.					
			Develop exit strategies.					
	3.6	The student demonstrates an understanding of information management concepts and how they support effective business operations.	Explain the role of and justification for information management.	4	3	2	1	0
			Describe the nature of business records.					
			Explain the business and legal benefits of a records management system.					

			Explain how a records management program is established.					
			Describe the steps in planning and implementing a records management system.					
	3.7	Describe the impact of the Internet on entrepreneurship/small business ownership.	Explain the nature of e-commerce.	4	3	2	1	0
			Develop basic website.					
			Communicate by computer.					
			Demonstrate basic search skills on the Web.					
			Evaluate credibility of Internet resources.					
Benchmark	4.0	Understands the concepts, processes, and systems needed to determine and satisfy customer needs/wants/expectations, meet business goals/objectives, and create new product/service ideas.						
		Competencies	Sample Indicators					
	4.1	Understand marketing's role and function in business to facilitate economic exchanges with customers.	Determine services to provide customers.	4	3	2	1	0
			Explain the role of customer service in positioning/image.					
	4.2	Analyze the role of marketing research in constructing a small business management model.	Identify the reasons for conducting research.	4	3	2	1	0
			Explain the methods of market research, including an evaluation of the main research techniques.					
	4.3	Identify and explain primary and secondary market research.	Analyze the market viability of a new venture by conducting primary market research (surveys, interviews, etc) and secondary market research (publicly available reports, articles, etc).	4	3	2	1	0
	4.4	Describe marketing functions and related activities.	Identify elements of the marketing mix.	4	3	2	1	0

	4.5	Describe the components and purpose of a business plan.	Write a business venture executive summary.	4	3	2	1	0
			Describe the business venture in a company overview.					
			Determine the company mission statement, goals and objectives.					
			Describe the business environment and competition.					
			Describe the company description and marketing strategy.					
			Identify financial considerations.					
	4.6	Examine and explain the components and purpose of a financial plan for a business.	Estimate expenses for a start-up business.	4	3	2	1	0
			Identify break-even point.					
			Set profit goals.					
			Identify sources of capital.					
	4.7	Identify and evaluate a local entrepreneurial venture/business.	Evaluate all functions of business.	4	3	2	1	0
Benchmark	5.0	Understand organizational and financial tools used in making business decisions as it relates to entrepreneurship/small business ownership.						
		Competencies	Sample Indicators					
	5.1	Develop organizational skills to improve efficiency.	Apply time management principles.	4	3	2	1	0
			Develop a project plan.					
			Develop project management skills.					
			Describe the way technology affects operations management.					

	5.2	Identify and explain expense control strategies to enhance the financial well-being of a business.	Explain the nature of overhead/operating costs.	4	3	2	1	0
			Define expense control plans.					
	5.3	Give explanation on how entrepreneurs incorporate accounting in making business decisions.	Explain accounting standards (GAAP)	4	3	2	1	0
			Prepare estimated/projected income statement.					
			Estimate cash-flow needs.					
			Prepare estimated/projected balance sheet.					
			Calculate financial ratios.					
	5.4	Understand the need for proper financial and money management as it relates to an entrepreneur/small business owner.	Explain the purposes and importance of obtaining business credit.	4	3	2	1	0
			Describe use of credit bureaus.					
			Explain the nature of overhead/operating expenses.					
			Determine financing needed to start a business.					
			Determine risks associated with obtaining business credit.					
			Explain sources of financial assistance.					
			Explain loan evaluation criteria used by lending institutions.					
			Identify sources of business loans.					
			Determine business's value.					

			Explain the importance of having financial goals and objectives.					
			Define how to build and monitor a budget.					
			Explain the nature of capital investment.					
Benchmark	6.0	Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills. Obtain and develop strategies for ensuring a successful career in entrepreneurship/small business ownership.						
		Competencies	Sample Indicators					
	6.1	Develop personal traits and behaviors to foster career advancement.	Discuss appropriate personal appearance.	4	3	2	1	0
			Set personal goals.					
			Use time-management skills.					
			Discuss the role of one's community and network in achieving personal and professional success.					
	6.2	Demonstrate employability/career success skills.	Place artifacts that demonstrate employability/career success skills in the electronic portfolio section of the IPS (Individual Plan of Study).	4	3	2	1	0

Kansas Transportation, Distribution and Logistics Cluster

Course:	General Service I	Course #:	40150	Credit:	1.0
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – One	Level:	Technical
Course Description:	A technical level course designed to provide students with basic theories and information needed to develop an understanding of automotive and light truck vehicles.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Shop Operations and Safety		4	3	2	1	0
1.1	Demonstrate and apply safe working practices with tools and machines.					
1.2	Identify and follow safety procedures as outlined in OSHA guidelines.					
1.3	Identify sources of service information.					
1.4	Explain and use chemical safety procedures.					
1.5	Demonstrate proper use of PPE (personal protective equipment).					

Benchmark 2.0: Engine Repair		4	3	2	1	0
2.1	Demonstrate knowledge of engine fundamentals.					
2.2	Demonstrate knowledge of fluid maintenance.					
2.3	Inspect engine assembly for fluid leaks and recommend repair needs.					

Benchmark 3.0: Drive Train		4	3	2	1	0
3.1	Perform inspection of fluid levels on transmissions and axles.					

3.2	Lubricate u-joints.					
3.3	Inspect CV joints and boots.					
3.4	Explain basic transmission/differential operation.					

Benchmark 4.0: Suspension and Steering		4	3	2	1	0
4.1	Inspect steering fluid levels.					
4.2	Demonstrate knowledge of steering systems.					
4.3	Inspect system for leaks.					
4.4	Inspect tires for wear and proper pressures.					
4.5	Demonstrate knowledge of tire pressure monitoring (TPM) systems.					

Benchmark 5.0: Brakes		4	3	2	1	0
5.1	Demonstrate knowledge of brake principles.					
5.2	Inspect brake fluid levels.					
5.3	Demonstrate knowledge of brake fluids.					
5.4	Inspect hoses, fittings, and lines for damage.					
5.5	Inspect brake pads and shoes for wear and thickness.					
5.6	Inspect rotors, drums, and related hardware.					

Benchmark 6.0: Electrical Systems		4	3	2	1	0
6.1	Demonstrate knowledge of electrical principles.					
6.2	Solder/repair electrical wiring and connections.					
6.3	Identify components of electrical schematics.					
6.4	Understand basic diagnostic and troubleshooting processes.					
6.5	Perform battery maintenance and testing.					
6.6	Inspect vehicle lighting and basic electrical systems.					

Benchmark 7.0: HVAC		4	3	2	1	0
7.1	Demonstrate knowledge of HVAC fundamentals.					

7.2	Identify refrigerants used in Mobile HVAC.					
7.3	Identify and visually inspect HVAC components.					
7.4	Inspect and identify HVAC system for refrigerant leaks.					

Benchmark 8.0: Engine Performance		4	3	2	1	0
8.1	Perform engine scan tests.					
8.2	Interpret scan data and trouble codes.					
8.3	Identify and explain fuel delivery systems.					
8.4	Identify and explain exhaust and emission systems.					
8.5	Identify and explain ignition systems.					
8.6	Inspect vehicle filters.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Electronic & Electrical Systems I	Course #:	40200	Credit:	1.0
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Technical
Course Description:	A comprehensive, technical level course designed to provide students with the basic theories, equipment, and skills needed to inspect and service electrical systems.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Diagnose and repair battery starting and charging systems.		4	3	2	1	0
1.1	Clean and inspect battery clamps, cables, and connectors.					
1.2	Perform battery condition tests.					
1.3	Jump-start a vehicle.					
1.4	Charge and install a battery.					
1.5	Diagnose starting system problems and determine necessary action.					
1.6	Diagnose starting system problems and determine necessary action.					
1.7	Remove, clean, and inspect starter motor and components; reinstall.					
1.8	Apply knowledge and understanding of a parasitic drain test.					
1.9	Diagnose charging systems and repair or replace components if necessary.					
1.10	Remove, clean, inspect ,and reinstall generator (alternator).					
1.11	Maintain and restore electronic memory functions; identify and perform required reinitialization or code entry after a battery voltage loss.					

Benchmark 2.0: Electrical Circuits		4	3	2	1	0
2.1	Apply knowledge and understanding of basic electrical theories to construct and analyze all types of basic electrical circuits.					
2.2	Utilize electrical system schematics and symbols to locate and identify components and analyze and repair electrical circuits.					
2.3	Compute unknown voltages, amperage, and resistances in basic circuit types using Ohms Law.					
2.4	Check continuity in electrical circuits using a test light, DVOM.					
2.5	Check for shorts, opens, and grounds.					
2.6	Measure resistance in electrical circuits using an ohmmeter.					
2.7	Measure voltage with a voltage meter.					
2.8	Measure current with an ammeter and amp probe.					
2.9	Diagnose and repair wires, terminals, and wiring harnesses.					
2.10	Use voltage drop test to determine electrical circuit condition.					
2.11	Explore module networking communications.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Brakes I	Course #:	40204	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Technical
Course Description:	A comprehensive, technical level course designed to provide students with the basic theories, equipment, and skills needed to inspect and service braking systems.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: General Brake Systems Diagnosis		4	3	2	1	0
1.1	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.					

Benchmark 2.0: Hydraulic System Diagnosis and Repair		4	3	2	1	0
2.1	Diagnose pressure concerns in the brake system using hydraulic principles, Pascal's Law.					
2.2	Diagnose poor stopping, pulling, or dragging concerns, caused by malfunctions in the hydraulic system; determine necessary action.					
2.3	Inspect brake system for leaks, rust, cracks, and bulging or wear in lines.					
2.4	Fill brake fluids to proper level.					
2.5	Fabricate and/or install brake lines.					
2.6	Describe the purpose of the metering (hold-off) proportioning (balance), pressure differential and combination valves.					
2.7	Inspect, test, and/or replace components of brake warning light system.					
2.8	Describe the different types of brake fluids and select the correct type for the vehicle to be worked on.					
2.9	Identify and describe the master cylinder operation.					

2.10	Describe different methods of bleeding brakes and demonstrate at least one method.					
------	------------------------------------------------------------------------------------	--	--	--	--	--

Benchmark 3.0: Drum Brake Diagnosis and Repair		4	3	2	1	0
3.1	Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pedal pulsation concerns; determine necessary action.					
3.2	Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.					
3.3	Inspect, measure brake drums, and reassemble.					
3.4	Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings.					

Benchmark 4.0: Disc Brake Diagnosis and Repair		4	3	2	1	0
4.1	Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing; determine necessary action.					
4.2	Clean and inspect caliper mounting and slides for wear and damage; determine necessary action.					
4.3	Remove, clean, and inspect pads and retaining hardware; determine necessary action.					
4.4	Clean, inspect and measure rotor with a dial indicator and a micrometer; follow manufacture's recommendations in determining need to machine or replace.					
4.5	Describe or demonstrate caliper piston retraction on an integrated parking brake system.					

Benchmark 5.0: Power Assist Units Diagnosis and Repair		4	3	2	1	0
5.1	Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; determine necessary action.					
5.2	Demonstrate an understanding of and the application of a hydraulically assisted power brake system.					

Benchmark 6.0: Miscellaneous Diagnosis and Repair (Wheel Bearings, Parking Brakes, Electrical, etc.)		4	3	2	1	0
6.1	Diagnose wheel bearing noises, wheel shimmy, and vibration concern.					
6.2	Replace wheel bearing and grease.					
6.3	Remove and reinstall sealed wheel bearing assembly.					
6.4	Inspect and replace wheel studs.					
6.5	Demonstrate an understanding of and the application of air brake systems.					

Benchmark 7.0: Antilock Brake and Traction Control System		4	3	2	1	0
7.1	Identify and inspect antilock brake system (ABS components).					
7.2	Describe ABS principles of operation and retrieve ABS codes.					
7.3	Demonstrate proper removal and reinstallation of the tire and wheel assembly including proper torque of lug nuts.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Drive Train Technology	Course #:	40208	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Technical
Course Description:	A comprehensive, technical level course designed to provide students with the basic theories and skills needed to inspect and service drive train components.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Inspect and adjust shift linkage and transmission range sensor/switch.					
1.2	Inspect, test, and locate electrical/electronic transmission components including, solenoids, sensors, relays, connectors, switches, and harnesses.					
1.3	Use a scan tool to read transmission related data and diagnostic trouble codes.					
1.4	Identify basic manual transmission components and calculate gear ratios.					
1.5	Inspect and diagnose constant-velocity and standard universal joints for noise and vibration concerns.					
1.6	Inspect rear axle differential fluid; diagnose rear axle noise and vibration concerns.					
1.7	Research applicable vehicle and service information, such as transmission/transaxle operation, fluid type and service needs, bulletins and service precautions.					
1.8	Identify and interpret transmission/transaxle concerns and determine necessary operation.					
1.9	Inspect and determine cause of fluid leaks, condition, level, and replace fluid and filter where applicable.					
1.10	Perform stall test and determine necessary action.					
1.11	Perform transmission pressure test using Pascal's law to diagnose pressure concerns.					
1.12	Inspect clutch pedal linkage and cables; adjust as necessary.					
1.13	Inspect hydraulic slave and master cylinders, lines, and hoses for leaks and condition; bleed system.					

1.14	Diagnose abnormal clutch operation and noise.					
1.15	Identify basic automatic transmission/transaxle components and theory of operation.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Engine Performance I	Course #:	40220	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Technical
Course Description:	A comprehensive, technical level course designed to provide students with the basic skills needed to inspect, understand, and diagnose engine control systems.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Demonstrate and apply safe working practices with tools and machines.					
1.2	Identify and follow safety procedures as outlined in OSHA guidelines.					
1.3	Access VIN information, electronic service information, and complete customer repair order.					
1.4	Conduct engine performance tests using diagnostic test equipment and determine necessary action.					
1.5	Identify engine service precautions for hybrid vehicles.					
1.6	Utilize a scan tool to view computer data stream information.					
1.7	Retrieve and record diagnostic trouble codes.					
1.8	Identify and test computer input sensors and devices.					
1.9	Identify and test computer-controlled output devices.					
1.10	Identify, test, and replace ignition system primary and secondary components.					
1.11	Diagnose ignition/fuel related no start conditions.					
1.12	Diagnose ignition/fuel related misfire conditions, power loss, and poor drivability					
1.13	Demonstrate knowledge of vehicle networking.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Steering & Suspension I	Course #:	40224	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Technical
Course Description:	A comprehensive, technical level course designed to provide students with the basic theories, equipment, and skills needed to inspect and service steering and suspension systems.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Steering System Service and Repair		4	3	2	1	0
1.1	Demonstrate and apply safe working practices with tools and machines.					
1.2	Identify and follow safety procedures as outlined in OSHA guidelines.					
1.3	Clean and inspect electric, hydraulic, and manual steering gear boxes.					
1.4	Inspect, repair, and replace steering linkage components.					
1.5	Diagnose steering and tire wear problems; determine necessary action.					

Benchmark 2.0: Diagnose and Repair Front and Rear Suspension Systems		4	3	2	1	0
2.1	Diagnose conventional and electronic front suspension systems; determine necessary action.					
2.2	Inspect control arm and spring assemblies on conventional systems.					
2.3	Inspect shock absorbers and stabilizer bars.					
2.4	Diagnose McPherson strut assemblies and determine necessary action.					

Benchmark 3.0: Tire and Wheel Alignment Service		4	3	2	1	0
3.1	Perform a pre-alignment inspection					
3.2	Inspect wheel hubs, spindles, and bearings.					
3.3	Rotate and balance tires, install and torque wheel assemblies, and adjust tire pressure.					
3.4	Inspect, diagnose, and calibrate tire pressure monitoring system					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Mobile HVAC	Course #:	40228	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Technical
Course Description:	A comprehensive technical level course designed to provide students with the basic and advanced theory of operation, service and repair of the air conditioning, heating, and vehicle cooling system as it relates to the mobile climate control system.				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: A/C System Diagnosis and Repair		4	3	2	1	0
1.1	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause & correction, and identify and interpret heating and air conditioning concern.					
1.2	Performance test A/C system including abnormal noises and leak test.					
1.3	Identify refrigerant type; select and connect proper gauge set and record temperature and pressure readings.					
1.4	Using scan tool, observe and record HVAC data and trouble codes and determine the necessary action.					

Benchmark 2.0: Refrigeration System Component Diagnosis and Repair		4	3	2	1	0
2.1	Remove, inspect, and reinstall A/C compressor; determine oil quantity.					
2.2	Inspect and replace A/C compressor drive belts, pulleys, and tensioners.					
2.3	Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and PCM) to interrupt system operation; determine necessary action.					
2.4	Inspect A/C condenser for airflow restrictions; remove and replace condenser; determine oil quantity.					
2.5	Remove, inspect and replace evaporator.					
2.6	Remove, inspect and replace receiver/drier or accumulator/drier; determine oil quantity.					

Benchmark 3.0: Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair		4	3	2	1	0
3.1	Diagnose temperature control problems in the heater/ventilation system.					
3.2	Inspect engine cooling including hoses and belts.					
3.3	Inspect, test, and replace thermostat and gasket/seal.					
3.4	Determine coolant condition and coolant type for vehicle application; drain and recover coolant, Flush system; refill system with recommended coolant; bleed system.					
3.5	Inspect and test electric/mechanical cooling fan, fan control system and circuits.					
3.6	Inspect and test heater control valve(s).					
3.7	Remove, inspect, and replace heater core.					

Benchmark 4.0: Operating Systems and Related Controls Diagnosis and Repair		4	3	2	1	0
4.1	Diagnose malfunctions in the electrical controls of heating, ventilation, and A/C (HVAC) systems.					
4.2	Diagnose malfunctions in the vacuum and mechanical components and controls of the HVAC system.					
4.3	Describe the proper operation of the thermostat.					

Benchmark 5.0: Refrigerant Recovers, Recycling, and Handling		4	3	2	1	0
5.1	Identify and recover A/C system refrigerant including recycling, labeling, and storing of refrigerant.					
5.2	Evacuate and charge A/C system and add refrigerant oil as needed.					

Benchmark 6.0: Safety Practices		4	3	2	1	0
6.1	Comply with personal and environmental safety practices associated with clothing, eye protection, hand tools, power tools, proper ventilation.					
6.2	Demonstrate proper handling and storage and disposal of chemicals/materials in accordance with local, state and safety organizations.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Work Experience in Transportation	Course #:	40250	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Collision Auto Technology – One & Two	Level:	Application
Course Description:	An advanced research and application level course covering specific topics in transportation. Should include opportunities for Work-Based Learning (WBL) such as in-house training, job shadowing, and/or internships. <i>(Prerequisite: Must take at least 1.0 credit of Technical level course and Application level course combined.)</i>				

Directions: The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Employability Skills and Career Development Strategies		4	3	2	1	0
1.1	Complete a Work-Based Learning experience plan.					
1.2	Enhance Individual Plan of Study through interest assessment(s).					
1.3	Research and report on careers in transportation.					
1.4	Research licensing certification and credentialing in the transportation industry.					
1.5	Create a professional portfolio to document activities completed while working with a mentor or through an internship in the transportation industry.					
1.6	Prepare a resume to include in student Individual Plan of Study (IPS).					
1.7	Prepare a letter of application to include in student Individual Plan of Study (IPS).					
1.8	Demonstrate interview skills through mock or actual employment interview.					

Benchmark 2.0: Interpersonal Skills – Making Informed Decisions to Continue Business Operations		4	3	2	1	0
2.1	Demonstrate sound customer services principles when working with customer or client to complete a client-driven project.					
2.2	Develop and maintain professional working relationships.					

Benchmark 3.0: Communication in the Workplace - Concepts, Strategies, and Systems		4	3	2	1	0
3.1	Apply verbal skills when obtaining and conveying information.					
3.2	Use appropriate grammar and word usage in the creation and delivery of a formal graphic presentation using current standards and technology.					
3.3	Develop and deliver oral presentations to provide information for specific purposes.					

Benchmark 4.0: Professional Workplace - Technical Knowledge and Skills		4	3	2	1	0
4.1	Research and report on "Green" applications in the Transportation industry.					
4.2	Research and discuss modern & future trends in equipment, methods, & techniques.					
4.3	Conduct project and facility evaluations and critique their effectiveness.					
4.4	Understand MSDS (Material Safety Data Sheets) and other safety resources required for the workplace.					
4.5	Demonstrate an understanding of OSHA regulations for personal safety, including utilization of PPE, safe use of tools & equipment, and safe handling of hazardous materials.					
4.6	Access and utilize industry resources.					
4.7	Utilize knowledge and skills to perform job duties to industry standards.					
4.8	Utilize effective management techniques to organize workflow.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Work Experience in Transportation - Comprehensive	Course #:	40251	Credit:	1.0
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Collision Auto Technology – One & Two	Level:	Application
Course Description:	An advanced research and application course covering specific topics in transportation. Should include opportunities for Work-Based Learning (WBL) such as in-house training, job shadowing, and/or internships. In relationship to the half credit version, the full credit version requires more in-depth research opportunities, the creation of a portfolio documentation of internship activities, and the completion of the OSHA 10 Safety Certification course. <i>(Prerequisite: Must take at least 1.0 credit of Technical level course and Application level course combined.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Employability Skills and Career Development Strategies		4	3	2	1	0
1.1	Complete a Work-Based Learning experience plan.					
1.2	Enhance Individual Plan of Study through interest assessment(s).					
1.3	Research and report on careers in transportation.					
1.4	Research licensing certification and credentialing in the transportation industry.					
1.5	Create a professional portfolio to document activities completed while working with a mentor or through an internship in the transportation industry.					
1.6	Prepare a resume to include in student Individual Plan of Study (IPS).					
1.7	Prepare a letter of application to include in student Individual Plan of Study (IPS).					
1.8	Demonstrate interview skills through mock or actual employment interview.					

Benchmark 2.0: Interpersonal Skills – Making Informed Decisions to Continue Business Operations		4	3	2	1	0
2.1	Demonstrate sound customer services principles when working with customer or client to complete a client-driven project.					
2.2	Develop and maintain professional working relationships.					

Benchmark 3.0: Communication in the Workplace - Concepts, Strategies, and Systems		4	3	2	1	0
3.1	Apply verbal skills when obtaining and conveying information.					
3.2	Use appropriate grammar and word usage in the creation and delivery of a formal graphic presentation using current standards and technology.					
3.3	Develop and deliver oral presentations to provide information for specific purposes.					
3.4	Prepare simple documents and other business communications.					
3.5	Use information technology tools to manage and perform work responsibilities.					

Benchmark 4.0: Professional Workplace - Technical Knowledge and Skills		4	3	2	1	0
4.1	Research and report on “Green” applications in the Transportation industry.					
4.2	Research and discuss modern & future trends in equipment, methods, & techniques.					
4.3	Conduct project and facility evaluations and critique their effectiveness.					
4.4	Understand MSDS (Material Safety Data Sheets) and other safety resources required for the workplace.					
4.5	Demonstrate an understanding of OSHA regulations for personal safety, including utilization of PPE, safe use of tools & equipment, and safe handling of hazardous materials.					
4.6	Access and utilize industry resources.					
4.7	Utilize knowledge and skills to perform job duties to industry standards.					
4.8	Utilize effective management techniques to organize workflow.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Small Engines and Powertrains II	Course #:	40214	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Technology – One & Two	Level:	Application
Course Description:	A comprehensive, application level course designed to provide students with advanced knowledge and skills common to all small engine operations and repair. <i>(Prerequisite: Small Engines and Powertrains I.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Perform preventive maintenance on tools and equipment.					
1.2	Follow safety procedures as outlined in OSHA guidelines.					
1.3	Perform electrical system service, diagnostics, and testing.					
1.4	Perform fuel system service and diagnosis.					
1.5	Perform ignition system service and diagnosis.					
1.6	Describe and explain the principles of multiple cylinder engines.					
1.7	Perform starting and charging system service and diagnosis.					
1.8	Demonstrate advanced troubleshooting techniques.					
1.9	Research and discuss the advantages and disadvantages of alternative power systems.					
1.10	Prepare a repair order and estimate required time and materials to accomplish service procedure.					
1.11	Discuss/Explain the principles of hydraulics.					
1.12	Perform troubleshooting techniques.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	General Service II	Course #:	40152	Credit:	1.0
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – One	Level:	Application
Course Description:	A comprehensive, application level course designed to provide students with knowledge in the theory of operation, the equipment, and the skills necessary for employment in the field of automotive and light truck service. <i>(Prerequisite: General Service I.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

- 4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
- 3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
- 2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
- 1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
- 0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Shop Operations and Safety		4	3	2	1	0
1.1	Demonstrate and apply safe working practices with tools and machines.					
1.2	Identify and follow safety procedures as outlined in OSHA guidelines.					
1.3	Identify & retrieve sources of service information.					
1.4	Demonstrate proper handling of chemicals used in the automotive shop.					
1.5	Utilize PPE (personal protective equipment) properly in all required shop areas.					
1.6	Demonstrate proper handling and disposal of hazardous materials.					

Benchmark 2.0: Engine Repair		4	3	2	1	0
2.1	Demonstrate engine removal and installation procedures.					
2.2	Inspect cooling system components.					
2.3	Disassemble, clean, and inspect engine components.					
2.4	Perform engine diagnostic tests.					
2.5	Perform engine maintenance procedures.					

Benchmark 3.0: Drive Train		4	3	2	1	0
3.1	Perform fluid service on transmissions and axles.					
3.2	Demonstrate drive shaft removal and installation.					
3.3	Service u-joints.					
3.4	Inspect and service CV joint equipped drivelines.					
3.5	Research and differentiate between four-wheel drive and AWD operation.					
3.6	Research and differentiate between FWD and RWD.					
3.7	Research and discuss clutch operation and service.					

Benchmark 4.0: Suspension and Steering		4	3	2	1	0
4.1	Demonstrate knowledge of steering and suspensions.					
4.2	Inspect and replace steering fluid.					
4.3	Inspect system for leaks and determine necessary action.					
4.4	Demonstrate knowledge of component replacement.					
4.5	Perform a pre-alignment inspection.					
4.6	Demonstrate knowledge of principles of steering geometry.					
4.7	Rotate tires according to manufacturer's recommendation.					
4.8	Dismount, inspect, and repair wheels and tires.					
4.9	Balance wheel/tire assembly.					
4.10	Demonstrate working knowledge of proper wheel torque.					
4.11	Demonstrate proper service of tire pressure monitoring (TPM) systems.					

Benchmark 5.0: Brakes		4	3	2	1	0
5.1	Demonstrate knowledge of brake principles.					
5.2	Inspect and service brake fluid.					
5.3	Demonstrate brake system bleeding procedures.					
5.4	Repair and/or replace hoses, fittings, and lines.					
5.5	Replace brake pads, shoes, and associated assemblies.					
5.6	Service rotors and drums according to manufacturer's specs.					
5.7	Inspect caliper and wheel cylinder assemblies.					
5.8	Service wheel hub and/or bearing assemblies.					

5.9	Perform operational brake inspection.					
-----	---------------------------------------	--	--	--	--	--

Benchmark 6.0: Electrical Systems		4	3	2	1	0
6.1	Demonstrate knowledge of electrical principles.					
6.2	Solder/repair electrical wiring and connections.					
6.3	Utilize schematics in electrical diagnoses.					
6.4	Research and explain basic diagnostic and troubleshooting processes.					
6.5	Perform starting and charging system tests.					
6.6	Demonstrate the proper usage of a test light and DVOM.					
6.7	Demonstrate battery service.					
6.8	Test, diagnose, and repair electrical systems.					

Benchmark 7.0: HVAC		4	3	2	1	0
7.1	Compare and Contrast HVAC systems.					
7.2	Demonstrate proper refrigerant identification and recovery procedures ; conduct performance tests of HVAC system and determine necessary action.					

Benchmark 8.0: Engine Performance		4	3	2	1	0
8.1	Perform engine scan tests ; interpret scan data and trouble codes.					
8.2	Perform emissions testing.					
8.3	Perform engine diagnostic procedures.					
8.4	Discuss and compare/contrast fuel systems.					
8.5	Diagnose problems with intake and exhaust systems.					

Benchmark 9.0: Alternative Energy		4	3	2	1	0
9.1	Research and compare/contrast basic alternative power systems.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	General Service III	Course #:	40154	Credit:	1.0
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – One	Level:	Application
Course Description:	An advanced, comprehensive, application level course that provides students opportunities to perform inspection, diagnosis and repair of automobiles and light-duty trucks. May include Work-Based Learning (WBL) opportunities. <i>(Prerequisite: General Service II.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Shop Operations and Safety		4	3	2	1	0
1.1	Demonstrate and apply safe working practices with tools and machines.					
1.2	Identify and follow safety procedures as outlined in OSHA guidelines.					
1.3	Utilize service information in automotive repair procedures.					
1.4	Evaluate shop environment for proper safety procedures.					
1.5	Demonstrate fastener usage and repair.					
1.6	Discuss operations and safety of SRS systems.					
1.7	Utilize safety precautions in servicing of high voltage power systems.					
1.8	Locate and utilize technical service bulletins.					

Benchmark 2.0: Engine Repair		4	3	2	1	0
2.1	Remove and replace cooling system components.					
2.2	Perform engine diagnostic tests.					

2.3	Utilize precision measuring instruments in testing and diagnostic procedures.					
2.4	Determine necessary action for engine components after disassembly and cleaning.					
2.5	Change engine oil and filter.					
2.6	Change fuel filter.					

Benchmark 3.0: Drive Train		4	3	2	1	0
3.1	Remove and replace CV shafts.					
3.2	Remove and replace u-joints.					
3.3	Inspect 4WD/AWD transfer case and determine appropriate function.					

Benchmark 4.0: Suspension and Steering		4	3	2	1	0
4.1	Perform a pre-alignment inspection.					
4.2	Properly set-up alignment equipment and demonstrate understanding of proper operation.					
4.3	Demonstrate knowledge and proper adjustment procedures for 4-wheel alignment techniques.					

Benchmark 5.0: Brakes		4	3	2	1	0
5.1	Demonstrate knowledge of ABS brake principles.					
5.2	Replace brake pads and shoes and associated assemblies.					
5.3	Service rotors and drums according to manufacturer's specs.					
5.4	Inspect, diagnose, and repair caliper and wheel cylinder assemblies.					
5.5	Inspect, diagnose and repair master cylinder and power assist brake systems.					
5.6	Inspect and service parking brake.					
5.7	Discuss and compare/contrast operational principles of traction control and accident avoidance systems.					
5.8	Analyze brake stop light function and determine necessary action.					
5.9	Replace wheel hub and bearing assemblies.					

Benchmark 6.0: Electrical Systems		4	3	2	1	0
6.1	Replace and aim headlights and bulbs.					
6.2	Diagnose repair needs for starters, relays, and solenoids.					
6.3	Maintain or restore electronic memory functions.					

Benchmark 7.0: HVAC		4	3	2	1	0
7.1	Demonstrate proper refrigerant identification and recovery procedures.					
7.2	Conduct performance tests of HVAC system and determine necessary action.					
7.3	Perform leak test.					
7.4	Remove and replace HVAC components.					
7.5	Inspect and recharge HVAC system with refrigerant.					
7.6	Perform AC system evacuation.					
7.7	Inspect, diagnose, and repair air conditioner compressor and clutch.					
7.8	Inspect, diagnose, and repair electrical HVAC control circuits.					
7.9	Diagnose heating system malfunctions.					
7.10	Service heater control system.					

Benchmark 8.0: Engine Performance		4	3	2	1	0
8.1	Explain the basic operating principles of ignition and fuel systems.					
8.2	Diagnose ignition and fuel system for proper operation.					
8.3	Identify basic principles of electronic engine management.					
8.4	Identify basic diagnostic steps for engine control systems.					
8.5	Perform engine scan test.					
8.6	Interpret scan data and trouble codes.					
8.7	Perform operational tests of engine sensors and control units.					
8.8	Demonstrate knowledge of emissions system.					
8.9	Perform emission system diagnostic procedures and identify components.					
8.10	Perform engine mechanical diagnostic procedures.					

8.11	Perform diagnostic tests of fuel delivery system and identify components.					
8.12	Diagnose engine temperature related concerns and identify components.					
8.13	Remove and replace thermostat and gasket.					
8.14	Diagnose air intake and exhaust systems and identify components.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Electronics & Electrical Systems II	Course #:	40202	Credit:	1.0
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Application
Course Description:	A comprehensive, application level course designed to provide students with the basic skills needed to inspect, service, and repair electrical circuits and devices. <i>(Prerequisite: Electronic & Electrical Systems I.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Identify location of Hybrid vehicle high voltage circuit disconnect location and safety procedures.					
1.2	Diagnose lighting system problems; inspect, replace, and aim headlights and bulbs.					
1.3	Repair or replace sockets, wires, and switches.					
1.4	Diagnose and repair gauge, warning, and horn circuits.					
1.5	Diagnose and repair wiper, windshield washer, and motor-driven accessory circuits.					
1.6	Diagnose and repair heated glass and electric locks.					
1.7	Diagnose and repair cruise control systems.					
1.8	Diagnose and repair supplemental restraint systems.					
1.9	Diagnose and repair radio systems.					
1.10	Diagnose and repair keyless entry and anti-theft systems.					
1.11	Diagnose body electrical systems with a scan tool.					
1.12	Use test equipment to record and diagnose waveforms from electrical sensors and actuators.					
1.13	Use a scan tool to check computer network communication systems.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Brakes II	Course #:	40206	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Application
Course Description:	A comprehensive, application level course designed to provide students with the basic skills needed to inspect, service and repair braking systems to industry standards. <i>(Prerequisite: Brakes I.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: General Brake Systems Diagnosis		4	3	2	1	0
1.1	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.					
1.2	Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pedal pulsation concerns; determine necessary action.					

Benchmark 2.0: Hydraulic System Diagnosis and Repair		4	3	2	1	0
2.1	Measure brake pedal height; determine necessary action.					
2.2	Check master cylinder for leaks and proper operation; determine necessary action.					
2.3	Remove, bench bleed, and reinstall master cylinder.					
2.4	Flush or bleed hydraulic system.					

Benchmark 3.0: Drum Brake Diagnosis and Repair		4	3	2	1	0
3.1	Remove, inspect, and install wheel cylinders.					
3.2	Remove, inspect, refinish, and measure drum.					

Benchmark 4.0: Disc Brake Diagnosis and Repair		4	3	2	1	0
4.1	Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing; determine necessary action.					
4.2	Disassemble and clean caliper assembly inspect part for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts.					
4.3	Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks.					
4.4	Remove, refinish and replace rotor on and off vehicle.					
4.5	Adjust caliper equipped with an integrated parking brake system.					

Benchmark 5.0: Power Assist Units Diagnosis and Repair		4	3	2	1	0
5.1	Test pedal free travel with and without engine running; check power assist operation.					
5.2	Inspect the vacuum-type power booster unit for vacuum leaks and inspect the check valve for proper operation; Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.					
5.3	Measure and adjust master cylinder pushrod length.					
5.4	Inspect and test hydraulic/electric assisted power brake system for leaks and proper operation; determine necessary action.					

Benchmark 6.0: Diagnosis and Repair of Wheel Bearings, Parking Brakes, Electrical, etc.		4	3	2	1	0
6.1	Inspect and diagnose parking brake operation including parking brake cables and components, for wear, rusting, binding, and corrosion; clean, lubricate, or replace as needed.					
6.2	Analyze operation of brake stop light system and the parking brake indicator light system.					
6.3	Demonstrate proper removal and reinstallation of tire wheel assembly including proper torque of lugnuts.					
6.4	Demonstrate inspection and service of both sealed and non-sealed wheel bearings.					

Benchmark 7.0: Antilock Brake and Traction Control System		4	3	2	1	0
7.1	Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise concerns caused by the antilock brake system (ABS); determine necessary action.					
7.2	Diagnose antilock brake system (ABS) electronic controls and components using self-diagnosis and/or recommended test equipment; including braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio).					
7.3	Depressurize high-pressure components of the antilock brake system (ABS).					
7.4	Bleed the antilock brake system's (ABS) front and rear hydraulic circuits.					
7.5	Remove and install antilock brake system (ABS) electrical and hydraulic components.					
7.6	Test, diagnose and service ABS speed sensors, toothed ring (tone wheel), and circuits using a graphing multimeter (GMM), digital storage oscilloscope (DSO) or digital volt ohm meter (DVOM) (including output signal, resistance, shorts to voltage/ground, and frequency data).					

7.7	Identify traction control/vehicle stability control system components.					
7.8	Identify and describe traction control/ vehicle stability control system and its components.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Small Engines and Powertrains II	Course #:	40214	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Auto Technology – One & Two	Level:	Application
Course Description:	A comprehensive, application level course designed to provide students with advanced knowledge and skills common to all small engine operations and repair. <i>(Prerequisite: Small Engines and Powertrains I.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Perform preventive maintenance on tools and equipment.					
1.2	Follow safety procedures as outlined in OSHA guidelines.					
1.3	Perform electrical system service, diagnostics, and testing.					
1.4	Perform fuel system service and diagnosis.					
1.5	Perform ignition system service and diagnosis.					
1.6	Describe and explain the principles of multiple cylinder engines.					
1.7	Perform starting and charging system service and diagnosis.					
1.8	Demonstrate advanced troubleshooting techniques.					
1.9	Research and discuss the advantages and disadvantages of alternative power systems.					
1.10	Prepare a repair order and estimate required time and materials to accomplish service procedure.					
1.11	Discuss/Explain the principles of hydraulics.					
1.12	Perform troubleshooting techniques.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Engine Performance II	Course #:	40222	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Application
Course Description:	A comprehensive, application level course designed to provide students with the skills needed to inspect, service, and repair engine control systems. <i>(Prerequisite: Engine Performance I.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0:		4	3	2	1	0
1.1	Demonstrate and apply safe working practices with tools and machines.					
1.2	Identify and follow safety procedures as outlined in OSHA guidelines.					
1.3	Retrieve and interpret computer diagnostic codes and data to repair computer related engine problems.					
1.4	Identify, remove, and replace faulty computer input sensors and output devices.					
1.5	Locate and interpret computer diagnostic monitor data.					
1.6	Use a scan tool to record and interpret computer data information.					
1.7	Explain the process used to download and install on-board computer updates.					
1.8	Diagnose fuel and air induction system problems; determine necessary action.					
1.9	Inspect, repair, and/or replace fuel supply components.					
1.10	Disassemble, clean, inspect, and replace fuel injection components.					
1.11	Diagnose and repair exhaust system concerns, including exhaust color and odor.					
1.12	Diagnose emission control systems problems and determine necessary action.					
1.13	Clean, inspect, and replace positive crankcase ventilation (PCV) system components.					
1.14	Clean, inspect, and replace exhaust gas recirculation (EGR) components.					
1.15	Test, inspect, and replace exhaust treatment components.					
1.16	Test, inspect, and replace fuel vapor control system components.					

1.17	Conduct engine mechanical noise and performance tests using diagnostic test equipment; determine necessary action. (Example: compression, leakage, vacuum, and back pressure).					
1.18	Verify camshaft mechanical, hydraulic, and electronic timing.					

Kansas Transportation, Distribution and Logistics Cluster

Course:	Steering and Suspension II	Course #:	40226	Credit:	.5
Pathways & CIP Codes:	Mobile Equipment Maintenance (47.9999)	Strand(s):	Automotive Technology – Two	Level:	Application
Course Description:	A comprehensive, application level course designed to provide students with the advanced skills needed to inspect, service, and repair steering and suspension systems. <i>(Prerequisite: Steering & Suspension I.)</i>				

Directions: *The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.*

Rating Scale:

4. Exemplary Achievement: Student possesses outstanding knowledge, skills, or professional attitude.
3. Proficient Achievement: Student demonstrates good knowledge, skills, or professional attitude.
Requires limited supervision.
2. Limited Achievement: Student demonstrates fragmented knowledge, skills, or professional attitude.
Requires close supervision.
1. Inadequate Achievement: Student lacks knowledge, skills, or professional attitude.
0. No Instruction / Training: Student has not received instruction or training in this area.

Student: _____

Graduation Date: _____

I certify that the student has received training in the areas indicated.

Instructor Signature: _____

Benchmark 1.0: Steering System Service and Repair		4	3	2	1	0
1.1	Diagnose steering systems and determine necessary action.					
1.2	Clean, inspect, adjust, and install electric hydraulic and manual steering gear boxes and rack and pinion steering gears.					
1.3	Inspect and repair steering column and steering linkage components.					
1.4	Inspect, repair, and replace power steering pumps and hydraulic lines.					
1.5	Disable and enable SRS systems following manufacturer's procedures.					
1.6	Test and diagnose electronically controlled steering systems; determine necessary action.					

Benchmark 2.0: Diagnose and Repair Front and Rear Suspension Systems		4	3	2	1	0
2.1	Test and diagnose conventional suspension systems; determine necessary action.					
2.2	Inspect and repair control arm and spring assemblies on conventional systems.					
2.3	Inspect and repair wheel hubs, spindles, and bearings.					
2.4	Inspect and replace shock absorbers and stabilizer bars.					
2.5	Diagnose, disassemble, inspect, and assemble McPherson strut assemblies; determine necessary action.					
2.6	Test and diagnose components of electronically controlled suspension systems; determine necessary action.					

Benchmark 3.0: Tire and Wheel Alignment Service		4	3	2	1	0
3.1	Diagnose steering and tire wear problems; determine necessary action.					
3.2	Set correct alignment angles on front and rear wheels.					
3.3	Dismount, inspect, repair, and remount tire on wheel.					
3.4	Diagnose vibration, measure tire and wheel run-out.					