

Georgia Department of Education

**Transportation, Distribution and Logistics Career Cluster
Basic Maintenance and Light Repair
Course Number 47.53110**

Course Description:

This course is designed as the foundational course for the Automobile Maintenance and Light Repair pathway. Students in this course will learn the basic skills needed to gain employment as a maintenance and light repair technician. Students will be exposed to courses in automotive preventative maintenance and servicing and replacing brakes, and steering and suspension components. In addition, student will learn how to do general electrical system diagnosis, learn electrical theory, perform basic tests and determine necessary action. In addition, students will learn how to evacuate and recharge air-conditioning systems using the proper refrigerant. The hours completed in this course are aligned with ASE/NATEF standards and are a base for the entry-level technician. The pre-requisite for this course is advisor approval.

Course Standard 1

TDL-BMLR-1

The following standard is included in all CTAE courses adopted for the Career Cluster/Pathways. Teachers should incorporate the elements of this standard into lesson plans during the course. The topics listed for each element of the standard may be addressed in differentiated instruction matching the content of each course. These elements may also be addressed with specific lessons from a variety of resources. This content is not to be treated as a unit or separate body of knowledge but rather integrated into class activities as applications of the concept.

Standard: Demonstrate employability skills required by business and industry.

The following elements should be integrated throughout the content of this course.

1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.

Person-to-Person Etiquette	Telephone and Email Etiquette	Cell Phone and Internet Etiquette	Communicating At Work	Listening
Interacting with Your Boss	Telephone Conversations	Using Blogs	Improving Communication Skills	Reasons, Benefits, and Barriers
Interacting with Subordinates	Barriers to Phone conversations	Using Social Media	Effective Oral Communication	Listening Strategies
Interacting with Co-workers	Making and Returning Calls		Effective Written Communication	Ways We Filter What We Hear
Interacting with Suppliers	Making Cold Calls		Effective Nonverbal Skills	Developing a Listening Attitude
	Handling Conference Calls		Effective Word Use	Show You Are Listening
	Handling Unsolicited Calls		Giving and Receiving Feedback	Asking Questions
				Obtaining Feedback
				Getting Others to Listen

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Nonverbal Communication	Written Communication	Speaking	Applications and Effective Résumés
Communicating Nonverbally	Writing Documents	Using Language Carefully	Completing a Job Application
Reading Body Language and mixed Messages	Constructive Criticism in Writing	One-on-One Conversations	Writing a Cover Letter
Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé
Improving Nonverbal Indicators		Large Group Communication	Selling Yourself in a Résumé
Nonverbal Feedback		Making Speeches	Terms to Use in a Résumé
Showing Confidence Nonverbally		Involving the Audience	Describing Your Job Strengths
Showing Assertiveness		Answering Questions	Organizing Your Résumé
		Visual and Media Aids	Writing an Electronic Résumé
		Errors in Presentation	Dressing Up Your Résumé

1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

Teamwork and Problem Solving	Meeting Etiquette
Thinking Creatively	Preparation and Participation in Meetings
Taking Risks	Conducting Two-Person or Large Group Meetings
Building Team Communication	Inviting and Introducing Speakers
	Facilitating Discussions and Closing
	Preparing Visual Aids
	Virtual Meetings

1.3 Exhibit critical thinking and problem solving skills to locate, analyze and apply information in career planning and employment situations.

Problem Solving	Customer Service	The Application Process	Interviewing Skills	Finding the Right Job
Transferable Job Skills	Gaining Trust and Interacting with Customers	Providing Information, Accuracy and Double Checking	Preparing for an Interview	Locating Jobs and Networking
Becoming a Problem Solver	Learning and Giving Customers What They Want	Online Application Process	Questions to Ask in an Interview	Job Shopping Online
Identifying a Problem	Keeping Customers Coming Back	Following Up After Submitting an Application	Things to Include in a Career Portfolio	Job Search Websites
Becoming a Critical Thinker	Seeing the Customer's Point	Effective Résumés:	Traits Employers are Seeking	Participation in Job Fairs
Managing	Selling Yourself and the Company	Matching Your Talents to a Job	Considerations Before Taking a Job	Searching the Classified Ads
	Handling Customer Complaints	When a Résumé Should be Used		Using Employment Agencies
	Strategies for Customer Service			Landing an Internship
				Staying Motivated to Search

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1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

Workplace Ethics	Personal Characteristics	Employer Expectations	Business Etiquette	Communicating at Work
Demonstrating Good Work Ethic	Demonstrating a Good Attitude	Behaviors Employers Expect	Language and Behavior	Handling Anger
Behaving Appropriately	Gaining and Showing Respect	Objectionable Behaviors	Keeping Information Confidential	Dealing with Difficult Coworkers
Maintaining Honesty	Demonstrating Responsibility	Establishing Credibility	Avoiding Gossip	Dealing with a Difficult Boss
Playing Fair	Showing Dependability	Demonstrating Your Skills	Appropriate Work Email	Dealing with Difficult Customers
Using Ethical Language	Being Courteous	Building Work Relationships	Cell Phone Etiquette	Dealing with Conflict
Showing Responsibility	Gaining Coworkers' Trust		Appropriate Work Texting	
Reducing Harassment	Persevering		Understanding Copyright	
Respecting Diversity	Handling Criticism		Social Networking	
Making Truthfulness a Habit	Showing Professionalism			
Leaving a Job Ethically				

1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team work skills.

Expected Work Traits	Teamwork	Time Management
Demonstrating Responsibility	Teamwork Skills	Managing Time
Dealing with Information Overload	Reasons Companies Use Teams	Putting First Things First
Transferable Job Skills	Decisions Teams Make	Juggling Many Priorities
Managing Change	Team Responsibilities	Overcoming Procrastination
Adopting a New Technology	Problems That Affect Teams	Organizing Workspace and Tasks
	Expressing Yourself on a Team	Staying Organized
	Giving and Receiving Constructive Criticism	Finding More Time
		Managing Projects
		Prioritizing Personal and Work Life

1.6 Present a professional image through appearance, behavior and language.

On-the-Job Etiquette	Person-to-Person Etiquette	Communication Etiquette	Presenting Yourself
Using Professional Manners	Meeting Business Acquaintances	Creating a Good Impression	Looking Professional
Introducing People	Meeting People for the First Time	Keeping Phone Calls Professional	Dressing for Success
Appropriate Dress	Showing Politeness	Proper Use of Work Email	Showing a Professional Attitude
Business Meal Functions		Proper Use of Cell Phone	Using Good Posture
Behavior at Work Parties		Proper Use in Texting	Presenting Yourself to Associates
Behavior at Conventions			Accepting Criticism
International Etiquette			Demonstrating Leadership
Cross-Cultural Etiquette			
Working in a Cubicle			

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Support of CTAE Foundation Course Standards and Georgia Standards of Excellence L9-10RST 1-10 and L9-10WHST 1-10:

Georgia Standards of Excellence ELA/Literacy standards have been written specifically for technical subjects and have been adopted as part of the official standards for all CTAE courses. Additional Georgia Standards of Excellence ELA/Literacy standards for Speaking and Listening are listed in the foundational course standards below.

Course Standard 2

TDL-BMLR-2

Identify and utilize safety procedures and proper tools.

- 2.1 Identify general shop safety rules and procedures.
- 2.2 Utilize safe procedures for handling of tools and equipment
- 2.3 Identify and use proper placement of floor jacks and jack stands.
- 2.4 Identify and use proper procedures for safe lift operation.
- 2.5 Utilize proper ventilation procedures for working within the lab/shop area.
- 2.6 Identify marked safety areas.
- 2.7 Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.
- 2.8 Identify the location and use of eye wash stations.
- 2.9 Identify the location of the posted evacuation routes.
- 2.10 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.
- 2.11 Identify and wear appropriate clothing for lab/shop activities.
- 2.12 Secure hair and jewelry for lab/shop activities.
- 2.13 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.
- 2.14 Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.
- 2.15 Locate and demonstrate knowledge of material safety data sheets (MSDS).

Support of CTAE Foundation Course Standards and Georgia Standards of Excellence

ELACC9-10SL1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

Course Standard 3

TDL-BMLR-3

Identify and utilize proper tools and equipment.

- 3.1 Identify tools and their usage in automotive applications.
- 3.2 Identify standard and metric designations.
- 3.3 Demonstrate safe handling and use of appropriate tools.
- 3.4 Demonstrate proper cleaning, storage, and maintenance of tools and equipment.
- 3.5 Demonstrate proper use of precision measuring tools (e.g. micrometer, dial-indicator, and dial-caliper).

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ELACC9-10SL4: Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

Course Standard 4

TDL-BMLR-4

Identify and utilize vehicle service information.

- 4.1 Identify information needed and the service requested on a repair order.
- 4.2 Identify purpose and demonstrate proper use of fender covers and mats.
- 4.3 Demonstrate use of the three C's (concern, cause, and correction).
- 4.4 Review vehicle service history.
- 4.5 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
- 4.6 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).

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Course Standard 5

TDL-BMLR-5

Demonstrate general engine service techniques.

- 5.1 Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- 5.2 Verify operation of the instrument panel engine warning indicators.
- 5.3 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
- 5.4 Inspect, replace, and adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.
- 5.5 Inspect, and test coolant; drain and recover coolant; flush and refill cooling system with recommended coolant; bleed air, as required.
- 5.6 Perform engine oil and filter change.

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Course Standard 6

TDL-BMLR-6

Perform general automatic transmission and manual transaxle and differential service.

- 6.1 Research applicable vehicle and service information, fluid type, vehicle service history, service precautions, and technical service bulletins.
- 6.2 Check fluid level in a transmission or a transaxle equipped with a dip-stick.
- 6.3 Check fluid level in a transmission or a transaxle not equipped with a dip-stick.
- 6.4 Check transmission fluid condition; check for leaks.
- 6.5 Inspect for leakage at external seals, gaskets, and bushings.
- 6.6 Drain and refill manual transmission/transaxle and final drive unit.
- 6.7 Check and adjust clutch master cylinder fluid level.

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- 6.8 Check hydraulic clutch for system leaks.
- 6.9 Clean and inspect differential housing; check for leaks; inspect housing vent.
- 6.10 Check and adjust differential housing fluid level.
- 6.11 Drain and refill differential housing.
- 6.12 Check for leaks at drive assembly seals; check vents; check lube level.

Support of CTAE Foundation Course Standards and Georgia Standards of Excellence

ELACC9-10SL2: Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

Course Standard 7

TDL-BMLR-7

Prepare vehicle for general suspension and steering systems service.

- 7.1 Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- 7.2 Determine proper power steering fluid type; inspect fluid level and condition.
- 7.3 Inspect for power steering fluid leakage; determine necessary action.
- 7.4 Inspect tire condition; identify tire wear patterns; check for correct size and application (load and speed ratings) and adjust air pressure; determine necessary action.
- 7.5 Rotate tires according to manufacturer's recommendations.
- 7.6 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly (static and dynamic).
- 7.7 Remove and properly re-install tire pressure monitoring system.
- 7.8 Inspect, dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.
- 7.9 Inspect tire and wheel assembly for air loss; perform necessary action. Explain patch/plug system.
- 7.10 Repair tire using internal patch.
- 7.11 Identify and test tire pressure monitoring systems (indirect and direct) for operation; verify operation of instrument panel lamps.

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Course Standard 8

TDL-BMLR-8

Perform hydraulic brake system service and repairs.

- 8.1 Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- 8.2 Select, handle, store, and fill brake fluids to proper level.
- 8.3 Install wheel and torque lug nuts.
- 8.4 Check parking brake cables and components for wear, binding and corrosion; clean, lubricate, adjust or replace, as needed.
- 8.5 Check operation of brake stop light system.

Course Standard 9

TDL-BMLR-9

Perform general electrical systems service.

- 9.1 Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- 9.2 Perform battery state-of-charge test; determine necessary action.
- 9.3 Confirm proper battery capacity for vehicle application; perform battery capacity test; determine necessary action.
- 9.4 Maintain or restore electronic memory functions.
- 9.5 Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs.
- 9.6 Perform slow/fast battery charge according to manufacturer's recommendations.
- 9.7 Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.
- 9.8 Identify high-voltage circuits of electric or hybrid electric vehicle.
- 9.9 Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace, as needed.
- 9.10 Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators.
- 9.11 Verify windshield wiper and washer operation; replace wiper blades.

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Course Standard 10

TDL-BMLR-10

Demonstrate knowledge of A/C systems.

- 10.1 Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- 10.2 Inspect and replace A/C compressor drive belts, pulleys, and tensioners; determine necessary action.

Course Standard 11

TDL-BMLR-11

Analyze engine performance.

- 11.1 Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
- 11.2 Inspect and replace A/C compressor drive belts, pulleys, and tensioners; determine necessary action.
- 11.3 Replace fuel filter(s).
- 11.4 Inspect, service, or replace air filters, filter housings, and intake ductwork.
- 11.5 Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; determine necessary action.

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Course Standard 12

TDL-BMLR-12

Develop an understanding of automotive careers, describing the principal fields of specializations and identifying associated career opportunities.

- 12.1 Identify education requirements for automotive occupations and locations where programs of study are available.
- 12.2 Match automotive job titles with qualifications and responsibilities.
- 12.3 Participate in activities related to career interests.

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Course Standard 13

TDL-BMLR-13

Examine how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects, and competitive events.

- 13.1 Explain the purpose, mission, objectives, motto, colors, official dress and other distinguishing characteristics of SkillsUSA.
- 13.2 Explain how participation in SkillsUSA can promote lifelong responsibility for community service, professional growth and development.
- 13.3 Explore the impact and opportunities SkillsUSA can develop to bring business and industry together with education in a positive working relationship through innovative leadership and career development programs.
- 13.4 Explore the local, state, and national opportunities available to students through participation in SkillsUSA, including, but not limited to conferences, competitions, community service, philanthropy, and other SkillsUSA activities.

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