

**Transportation, Distribution & Logistics Career Cluster
Automobile Service Technology 8
Course Number: 47.43800**

Course Description:

Students will learn the basic skills needed to gain employment as a maintenance and light repair technician. This course will expose the student to automotive preventative maintenance and servicing and replacing brakes, and steering and suspension components. Students will also learn electrical theory, learn general electrical system diagnosis, and perform basic tests to determine necessary action. In addition, students will learn how to evacuate and recharge air-conditioning systems using the proper refrigerant. The course standards are aligned with ASE/NATEF standards and are an excellent foundation for the entry-level technician. The prerequisite for this course is Master Automobile Service Technology 7.

Course Standard 1

TDL-AST8-1

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

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

Georgia Department of Education

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

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

Georgia Department of Education

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			

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.

Course Standard 2

TDL-AST8-2

Identify and utilize safety procedures and proper tools

The tasks in this standard originate from the NATEF Required Supplemental Tasks.

- 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 and use marked safety areas.
- 2.7 Identify the location and the types of fire extinguishers and other fire safety equipment.
- 2.8 Demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.
- 2.9 Identify the location and use of eye wash stations.
- 2.10 Identify and use the location and use of eye wash stations.
- 2.11 Identify the location of the posted evacuation routes.
- 2.12 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.
- 2.13 Identify and wear appropriate clothing for lab/shop activities.
- 2.14 Demonstrate securing hair and jewelry for lab/shop activities.
- 2.15 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.
- 2.16 Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.).
- 2.17 Locate and demonstrate knowledge of material safety data sheets (MSDS).

Course Standard 3

TDL-AST8-3

Identify and utilize proper tools and equipment.

- 3.1 Identify tools and the proper usage in automotive applications.
- 3.2 Identify and properly use standard and metric designation.
- 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 (i.e. micrometer, dial-indicator, dial-caliper).

Course Standard 4

TDL-AST8-4

Identify and utilize vehicle service information.

Preparing the Vehicle for Service

- 4.1 Identify information needed and the service requested on a repair order.
- 4.2 Identify purpose and demonstrate proper use of fender covers, 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.

Preparing the Vehicle for Customer

- 4.6 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).

Course Standard 5

TDL-AST8-5

Demonstrate general engine service techniques.

Course Standard 6

TDL-AST8-6

Perform general automatic transmission and manual transaxle and differential service.

General: Transmission and Transaxle Diagnosis

- 6.1 Perform pressure tests (including transmissions/transaxles equipped with electronic pressure control); determine necessary action (P-1).
- 6.2 Diagnose noise and vibration concerns; determine necessary action (P-2).
- 6.3 Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information (P-1).

AUTOMATIC TRANSMISSION AND TRANSAXLE

Off-Vehicle Transmission and Transaxle Repair

- 6.4 Disassemble, clean, and inspect transmission/transaxle (P-2).
- 6.5 Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, check valves/balls, screens, spacers, and gaskets) (P-2).
- 6.6 Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action. (P-2).
- 6.7 Assemble transmission/transaxle (P-2).
- 6.8 Inspect, measure, and reseal oil pump assembly and components (P-2).
- 6.9 Measure transmission/transaxle end play or preload; determine necessary action (P-1).
- 6.10 Inspect, measure, and replace thrust washers and bearings (P-2).
- 6.11 Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls (P-2).
- 6.12 Inspect bushings; determine necessary action (P-2).
- 6.13 Inspect and measure planetary gear assembly components; determine necessary action (P-2).
- 6.14 Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action (P-2).
- 6.15 Diagnose and inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action (P-2).
- 6.16 Inspect, measure, repair, adjust or replace transaxle final drive components (P-2).
- 6.17 Inspect clutch drum, piston, check-balls, springs, retainers, seals, and friction and pressure plates, bands and drums; determine necessary action (P-2).
- 6.18 Measure clutch pack clearance; determine necessary action (P-1).
- 6.19 Air test operation of clutch and servo assemblies (P-1).
- 6.20 Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, retainers; determine necessary action (P-2).

MANUAL DRIVE TRAIN AND AXLES

Transmission/Transaxle Diagnosis and Repair

- 6.21 Diagnose noise concerns through the application of transmission/transaxle power-flow principles (P-2).
- 6.22 Diagnose hard shifting and jumping out of gear concerns; determine necessary action (P-2).
- 6.23 Diagnose transaxle final drive assembly noise and vibration concerns; determine necessary action (P-3).
- 6.24 Disassemble, inspect clean, and reassemble internal transmission/transaxle components (P-3).

Georgia Department of Education

MANUAL DRIVE TRAIN AND AXLES

Drive Axle Diagnosis and Repair

- 6.25 Diagnose noise and vibration concerns; determine necessary action (P-2).
- 6.26 Remove, inspect, and reinstall drive pinion and ring gear, spacers, sleeves, and bearings (P-3).
- 6.27 Measure and adjust drive pinion depth (P-3).
- 6.28 Measure and adjust drive pinion bearing preload (P-3).
- 6.29 Measure and adjust side bearing preload and ring and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup or shim types) (P-3).
- 6.30 Check ring and pinion tooth contact patterns; perform necessary action (P-3).
- 6.31 Disassemble, inspect, measure, and adjust or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case (P-3).
- 6.32 Reassemble and reinstall differential case assembly; measure run out; determine necessary action (P-3).

Limited Slip Differential

- 6.33 Diagnose noise, slippage, and chatter concerns; determine necessary action (P-3).
- 6.34 Measure rotating torque; determine necessary action (P-3).

Drive Axles

- 6.35 Diagnose drive axle shafts, bearings, and seals for noise, vibration, and fluid leakage concerns; determine necessary action (P-26).

MANUAL DRIVE TRAIN AND AXLES

Four-wheel Drive/All-wheel Drive Component Diagnosis and Repair

- 6.36 Diagnose noise, vibration, and unusual steering concerns; determine necessary action (P-3).
- 6.37 Diagnose, test, adjust, and replace electrical/electronic components of four-wheel drive systems (P-3).
- 6.38 Disassemble, service, and reassemble transfer case and components (P-3).

Course Standard 7

TDL-AST8-7

Prepare vehicle for general suspension and steering systems service.

SUSPENSION AND STEERING

General: Suspension and Steering Systems

- 7.1 Identify and interpret suspension and steering system concerns; determine necessary action (P-1).

Steering Systems Diagnosis and Repair

- 7.2 Identify hybrid vehicle power steering system electrical circuits and safety precautions (P-2).

Course Standard 8

TDL-AST8-8

Perform hydraulic brake system service and repairs.

Course Standard 9

TDL-AST8-9

Perform general electrical systems service.

Course Standard 10

TDL-AST8-10

Demonstrate knowledge of A/C systems.

Course Standard 11

TDL-AST8-11

Analyze engine performance.