Wallenpaupack Area School District
Planned Course Curriculum Guide

Career & Technical Education

Automotive Technology III

Course Description:

Automotive Technology III is an advanced-level course designed for students pursuing deeper knowledge and hands-on experience in vehicle systems and diagnostics. This course emphasizes the inspection, service, and repair of brake systems, steering and suspension systems, and the application of automotive diagnostic strategies.

Students will build on foundational skills to perform detailed component analysis, system testing, and troubleshooting using industry-standard tools and procedures. Topics include hydraulic and electronic brake systems (including ABS), steering geometry and alignment, suspension components and ride control systems, and the use of scan tools and service information for diagnosing drivability concerns.

Through lab-based instruction and real-world scenarios, students will:

- Inspect and service disc and drum brake systems
- Diagnose and repair steering and suspension components
- Perform wheel alignments and evaluate ride quality
- Use scan tools and multimeters to interpret diagnostic trouble codes (DTCs)
- Apply systematic diagnostic routines to resolve performance and safety issues

This course prepares students for ASE certification areas and entry-level employment in the automotive industry, while reinforcing safety, professionalism, and technical accuracy.

Initial Creation Date (if applicable) and Revision Dates:
2004
Revised:
2007,2014,2025

Wallenpaupack Area School District Curriculum	
COURSE: Automotive Technology 3	**GRADE/S:** 12
UNIT 1: Safety	**TIMEFRAME:** 1-2 weeks

PA COMMON CORE/NATIONAL STANDARDS:

ELA:

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.

CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Math:

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

Career Education:

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.

13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

Science:

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.

Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.

Apply systems analysis to predict results.

Analyze and describe the function, interaction and relationship among subsystems and the system itself.

Compare and contrast several systems that could be applied to solve a single problem.

Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.

Know and use the ongoing scientific processes to continually improve and better understand how things work.

UNIT OBJECTIVES (SWBATS):

Students will be able to:

- Identify and demonstrate proper use of personal protective equipment (PPE).
- Interpret and apply information from Safety Data Sheets (SDS).
- Recognize and respond to common shop hazards.
- Understand and follow OSHA and school safety regulations.
- Demonstrate safe behavior in the use of tools, equipment, and chemicals.

- Explain emergency procedures including fire safety, first aid, and evacuation protocols.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Safety demonstrations
- SDS analysis and hazard identification exercises
- Shop safety scavenger hunt
- Group discussion on real-world safety incidents and prevention strategies
- Interactive safety quizzes and games

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Diagnostic: Safety knowledge pre-assessment
- Formative: Daily safety checks and behavior logs
- Summative: Written safety exam and hands-on safety demonstration
- Benchmark: Completion of OSHA 10 Safety Certification

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Advanced students lead safety briefings or assist in demonstrations
- Enrichment: Create a safety training video or digital presentation
- Visual aids, simplified instructions, and peer support for students with learning needs

RESOURCES (Technology Based Resources, Text Resources, etc.):

- OSHA website
- *Modern Automotive Technology* textbook
- Safety Data Sheets (SDS)
- Fire extinguisher and first aid kit demonstrations

KEY VOCABULARY:

- PPE (Personal Protective Equipment)
- SDS (Safety Data Sheet)
- OSHA (Occupational Safety and Health Administration)
- Hazard
- Lockout/Tagout
- Evacuation
- First Aid
- Fire Safety
- Chemical Safety

Wallenpaupack Area School District Curriculum	
COURSE: Automotive Technology 3	**GRADE/S:** 12
UNIT 2: Brakes	**TIMEFRAME:** 5-6 weeks

PA COMMON CORE/NATIONAL STANDARDS:

ELA:

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.
CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Math:

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

Career Education:

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.
13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

Science:

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.
Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.
Apply systems analysis to predict results.
Analyze and describe the function, interaction and relationship among subsystems and the system itself.
Compare and contrast several systems that could be applied to solve a single problem.
Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.
Know and use the ongoing scientific processes to continually improve and better understand how things work.

Competency Task List:

602 Identify and interpret brake system concerns.
605 Measure brake pedal height, travel, and free play as applicable.
606 Check master cylinder for internal/external leaks and proper operation.
607 Remove, bench bleed, and reinstall master cylinder.
608 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; and determine necessary actions.
609 Replace brake lines, hoses, fittings, and supports.
610 Fabricate brake lines using proper material and flaring procedures (double flare and ISO types).

611 Select, handle, store, and test brake fluid for contamination and fill to proper level.
612 Inspect, test, and replace components of brake warning light system.
613 Bleed and flush brake system.
614 Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pedal pulsation concerns.
615 Remove, clean, inspect, and measure brake drums.
616 Refinish brake drum and measure final drum diameter.
617 Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates then lubricate and reassemble.
618 Inspect and install wheel cylinders.
619 Pre-adjust brake shoes and parking brake, install brake drums or drum/hub assemblies, and wheel bearings.
620 Install wheel, torque lug nuts, and make final checks and adjustments.
622 Remove caliper assembly, inspect for leaks, and damage to caliper housing.
623 Clean and inspect caliper mounting and slides/pins for operation, wear, and damage.
624 Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads; and inspect for leaks.
625 Clean, inspect, and measure rotor thickness, lateral runout, and thickness variation.
626 Remove and reinstall rotor.
627 Refinish rotor and measure final rotor thickness.
630 Check brake pad wear indicator system operation.
632 Check vacuum supply to vacuum-type power booster and check power assist operation.
633 Remove, clean, inspect, repack, and install wheel bearings, RACES and replace seals; install hub; and adjust bearings.
634 Check parking brake cables and components including integral parking brake system for wear, binding, and corrosion then clean, lubricate, adjust, or replace as needed.
635 Check parking brake and indicator light system operation.
636 Check operation of brake stop light system.
638 Inspect and replace wheel studs.
639 Remove and reinstall sealed wheel bearing assembly.
640 Identify and inspect electronic brake control system components.
641 Diagnose electronic brake control system, electronic control(s), and components by retrieving diagnostic trouble codes and using recommended test equipment.
643 Bleed the electronic brake control system hydraulic circuits.
644 Identify traction control/vehicle stability control system components.
645 Describe the operation of a regenerative braking system.

UNIT OBJECTIVES (SWBATS):

Students will be able to:

- Identify and describe the components and operation of hydraulic brake systems.
- Explain the function of disc and drum brake systems.
- Perform brake inspections, measurements, and basic service procedures.
- Understand brake fluid properties and service requirements.
- Diagnose common brake system issues including noise, pulsation, and reduced braking performance.
- Demonstrate safe use of brake service tools and equipment.
- Understand the role of ABS (Anti-lock Braking System) and basic electronic brake control systems.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Hands-on labs inspecting and servicing disc and drum brakes
- Brake system component identification and function exercises
- Brake fluid testing and bleeding procedures
- Group discussions on braking safety and performance
- ABS system overview and scan tool diagnostics

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Diagnostic: Brake system knowledge quiz
- Formative: Daily lab logs and inspection worksheets
- Summative: Written exam and hands-on brake service assessment
- Benchmark: Completion of a brake inspection and service report

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Advanced students assist with ABS diagnostics or lead brake service demonstrations
- Enrichment: Research and present on performance brake systems or regenerative braking in hybrids
- Visual aids, simplified notes, and peer support for students with learning needs

RESOURCES (Technology Based Resources, Text Resources, etc.):

- Modern Automotive Technology textbook
- Brake service tools and measuring equipment
- OEM service manuals and brake system diagrams
- Online tutorials and animations of brake system operation
- ASE and manufacturer training materials

KEY VOCABULARY:

- Hydraulic Brakes
- Disc Brakes
- Drum Brakes
- Brake Pads
- Brake Shoes
- Brake Fluid
- ABS (Anti-lock Braking System)
- Caliper
- Master Cylinder
- Brake Rotor

Wallenpaupack Area School District Curriculum	
COURSE: Automotive Technology 3	**GRADE/S:** 12
UNIT 3: Steering and Suspension	**TIMEFRAME:** 7-8 weeks

PA COMMON CORE/NATIONAL STANDARDS:

ELA:

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.
CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Math:

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

Career Education:

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.
13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

Science:

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.
Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.
Apply systems analysis to predict results.
Analyze and describe the function, interaction and relationship among subsystems and the system itself.
Compare and contrast several systems that could be applied to solve a single problem.
Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.
Know and use the ongoing scientific processes to continually improve and better understand how things work.

Competency Task List:

502 Identify and interpret suspension and steering system concerns and determine necessary actions.
507 Inspect rack and pinion steering gear and mounting bushings and brackets.
508 Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.
509 Determine proper power steering fluid type and inspect fluid level and condition.
510 Flush, fill, and bleed power steering system.
511 Diagnose power steering fluid leakage and determine necessary actions.
513 Remove and reinstall power steering pump.
514 Remove and reinstall press fit power steering pump pulley and check pulley and belt alignment.

515 Inspect and replace power steering hoses and fittings.
516 Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper.
517 Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps.
519 Inspect, and replace upper and lower control arms, bushings, shafts, and rebound bumpers.
520 Inspect and replace strut rods and bushings.
521 Inspect and replace upper and lower ball joints.
522 Inspect and replace steering knuckle assemblies.
523 Inspect and replace short and long arm suspension system coil springs and spring insulators.
524 Inspect, replace, and adjust suspension system torsion bars and inspect mounts.
525 Inspect and replace stabilizer bar bushings, brackets, and links.
526 Inspect and replace strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.
527 Inspect, remove, and replace shock absorbers.
529 Lubricate suspension and steering systems.
530 Perform pre-alignment inspection and measure vehicle ride height and; perform necessary actions.
531 Perform four-wheel alignment.
535 Check front and rear cradle (subframe) alignment.
536 Inspect tire condition, identify tire wear patterns, and check and adjust air pressure.
537 Diagnose wheel/tire vibration, shimmy, and noise.
538 Rotate tires according to manufacturer's recommendations.
539 Measure wheel, tire, axle flange, and hub runout.
542 Dismount, inspect, and remount tire and balance wheel equipped with tire pressure monitoring system sensor.
544 Inspect tire and wheel assembly for air loss.
545 Repair tire using internal patch.
546 Identify indirect and direct tire pressure monitoring systems (TPMS), perform system calibration, and verify operation of instrument panel lamps.
547 Identify and perform steps required to remove and replace sensors in a tire pressure monitoring system (TPMS) including relearn procedure.
548 Identify the need for reset procedures post wheel alignment.
549 Identify and diagnose electronic power steering systems.

UNIT OBJECTIVES (SWBATS):

Students will be able to:

- Identify and describe tire, wheel, and wheel bearing components and their functions.
- Diagnose and repair tire, wheel, and wheel bearing issues.
- Explain the operation and components of suspension systems.
- Diagnose and repair common suspension system faults.
- Describe the function and types of steering systems.
- Diagnose and repair steering system components.
- Understand the principles and procedures of wheel alignment.
- Perform basic alignment checks and adjustments using appropriate equipment.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Hands-on labs inspecting and servicing tires, wheels, and bearings
- Suspension and steering system component identification exercises

- Demonstrations of alignment procedures and equipment use
- Group discussions on ride quality, handling, and safety
- Interactive diagrams and animations of system operation

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Diagnostic: Pre-assessment on steering and suspension systems
- Formative: Daily lab logs and inspection worksheets
- Summative: Written exam and hands-on service assessment
- Benchmark: Completion of a steering/suspension diagnostic and alignment report

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Advanced students assist with alignment setup or lead system walkthroughs
- Enrichment: Research and present on performance suspension systems or electronic steering technologies
- Visual aids, simplified notes, and peer support for students with learning needs

RESOURCES (Technology Based Resources, Text Resources, etc.):

- Modern Automotive Technology textbook
- OEM service manuals and system diagrams
- Alignment machines and tire service equipment
- Online tutorials and animations of steering/suspension operation
- ASE and manufacturer training materials

KEY VOCABULARY:

- Tire
- Wheel
- Wheel Bearing
- Suspension
- Shock Absorber
- Strut
- Steering Gear
- Tie Rod
- Wheel Alignment
- Camber, Caster, Toe

Wallenpaupack Area School District Curriculum	
COURSE: Automotive Technology 3	**GRADE/S:** 12
UNIT 3: Automotive Diagnostics	**TIMEFRAME:** 7-8 weeks

PA COMMON CORE/NATIONAL STANDARDS:

ELA:

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.

CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Math:

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

Career Education:

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.

13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

Science:

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.

Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.

Apply systems analysis to predict results.

Analyze and describe the function, interaction and relationship among subsystems and the system itself.

Compare and contrast several systems that could be applied to solve a single problem.

Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.

Know and use the ongoing scientific processes to continually improve and better understand how things work.

Competency Task List:

802 Identify and interpret engine performance concern.

812 Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns.

816 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data and clear codes when applicable.

817 Diagnose the causes of emissions or drivability concerns with stored or active diagnostic trouble codes and obtain, graph, and interpret scan tool data.

818 Access and use service information to perform step-by-step diagnosis.

819 Perform active tests of actuators using a scan tool.
820 Describe the importance of running all OBDII monitors for repair verification.
822 Inspect and test ignition primary and secondary circuit wiring and solid-state components and test ignition coil(s).
823 Inspect and test crankshaft and camshaft position sensor(s).
824 Inspect, test, and replace ignition control module and powertrain/engine control module and reprogram as necessary.
825 Diagnose hot or cold no-starting, hard starting, poor drivability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems.

UNIT OBJECTIVES (SWBATS):

Students will be able to:

- Understand the diagnostic process and its role in automotive service.
- Use visual inspection, customer input, and service history to identify vehicle concerns.
- Apply basic diagnostic strategies including symptom analysis and system testing.
- Use scan tools and multimeters to retrieve and interpret diagnostic trouble codes (DTCs).
- Access and utilize electronic service information (ESI) for troubleshooting procedures.
- Perform basic system tests to verify faults and confirm repairs.
- Document diagnostic findings and communicate repair recommendations.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Hands-on labs using scan tools and multimeters for system diagnostics
- Role-playing customer interviews and repair order documentation
- Guided practice using ESI platforms to research diagnostic procedures
- Group discussions on diagnostic strategies and troubleshooting logic
- Case studies of real-world vehicle faults and repair outcomes

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Diagnostic: Pre-assessment on diagnostic tools and procedures
- Formative: Daily lab logs and DTC interpretation worksheets
- Summative: Written exam and hands-on diagnostic assessment
- Benchmark: Completion of a diagnostic report and repair recommendation for a mock vehicle concern

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Advanced students assist with scan tool usage or lead diagnostic walkthroughs
- Enrichment: Research and present on advanced diagnostic technologies (e.g., CAN bus, ADAS diagnostics)
- Visual aids, simplified notes, and peer support for students with learning needs

RESOURCES (Technology Based Resources, Text Resources, etc.):

- Modern Automotive Technology textbook
- Scan tools and multimeters
- OEM service information systems (e.g., ALLDATA, Mitchell1)
- Online tutorials and diagnostic simulations
- ASE and manufacturer training materials

KEY VOCABULARY:

- Diagnostic Strategy
- DTC (Diagnostic Trouble Code)
- Scan Tool
- Multimeter
- ESI (Electronic Service Information)
- Symptom Analysis
- Fault Verification
- Repair Recommendation
- System Testing
- Customer Concern

Wallenpaupack Area School District Curriculum	
COURSE: Automotive Technology 3	**GRADE/S:** 12
UNIT 5: Heating and Air Conditioning	**TIMEFRAME:** 3-4 weeks

PA COMMON CORE/NATIONAL STANDARDS:

ELA:

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.
CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Math:

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

Career Education:

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.
13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

Science:

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.
Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.
Apply systems analysis to predict results.
Analyze and describe the function, interaction and relationship among subsystems and the system itself.
Compare and contrast several systems that could be applied to solve a single problem.
Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.
Know and use the ongoing scientific processes to continually improve and better understand how things work.

Competency Task List:

402 Prepare to obtain EPA 609 Refrigerant Recovery and Recycling Certification.
1203 Inspect air conditioning (A/C) condenser for airflow restrictions.
1204 Inspect engine cooling and heating systems hoses.
1205 Inspect A/C heating ducts, doors, hoses, cabin filters, and outlets.
1206 Check for A/C leaks.
1207 Identify refrigerant type and recovery procedure

UNIT OBJECTIVES (SWBATS):

Students will be able to:

- Identify components of automotive heating and air conditioning (A/C) systems.
- Explain the principles of heat transfer, refrigerant cycles, and climate control.
- Perform basic inspections and service procedures on heating and A/C systems.
- Safely handle refrigerants and understand environmental regulations.
- Diagnose and repair common heating and A/C system faults.
- Use A/C service equipment including recovery, recycling, and recharging tools.
- Understand electronic climate control systems and cabin air filtration.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Hands-on labs inspecting and servicing HVAC components
- Demonstrations of refrigerant recovery and recharging procedures
- Group discussions on climate control and passenger comfort
- Interactive diagrams and animations of HVAC system operation
- EPA Section 609 certification preparation activities

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- Diagnostic: HVAC system knowledge quiz
- Formative: Daily lab logs and service worksheets
- Summative: Written exam and hands-on HVAC service assessment
- Benchmark: Completion of a heating and A/C system diagnostic and service report

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Advanced students assist with refrigerant recovery or lead system walkthroughs
- Enrichment: Research and present on electric vehicle HVAC systems or heat pump technology
- Visual aids, simplified notes, and peer support for students with learning needs

RESOURCES (Technology Based Resources, Text Resources, etc.):

- Modern Automotive Technology textbook
- HVAC service equipment (manifold gauges, recovery machines, thermometers)
- OEM service manuals and system diagrams
- EPA Section 609 training materials
- Online tutorials and animations of HVAC operation

KEY VOCABULARY:

- HVAC (Heating, Ventilation, Air Conditioning)
- Refrigerant
- Compressor
- Condenser
- Evaporator
- Expansion Valve
- Climate Control
- Recovery Machine
- Cabin Air Filter
- Section 609 Certification