**Appendix A**

**New Hampshire Automobile Dealers Association**

**

**WORK PROCESS SCHEDULE**

**AND**

**RELATED INSTRUCTION OUTLINE**

**Appendix A**

**WORK PROCESS SCHEDULE**

Automotive Technician Specialist

O\*NET-SOC CODE: 49-3023.02 RAPIDS CODE: 1034CB

This schedule is attached to and a part of these Standards for the above identified occupation.

# APPRENTICESHIP APPROACH

[x]  Time-based [ ]  Competency-based [ ]  Hybrid

# TERM OF APPRENTICESHIP

The term of the apprenticeship is 1 year with an OJL attainment of 2000 hours, supplemented by the minimum required 144 hours of related instruction.

# RATIO OF APPRENTICES TO JOURNEYWORKERS

The apprentice to journeyworker ratio is: 1 Apprentice(s) to 1 journeyworker(s).

# APPRENTICE WAGE SCHEDULE

Apprentices shall be paid a progressively increasing schedule of wages based on either a percentage or a dollar amount of the current hourly journeyworker wage rate. Wage schedules shall be determined by the individual employers participating in this apprenticeship, and shall be documented appropriately in Appendix D No apprentice shall be paid less than minimum wage at any point throughout this apprenticeship.

# PROBATIONARY PERIOD

Every applicant selected for apprenticeship will serve a probationary period of 90 days*.*

# SELECTION PROCEDURES

 **SECTION I – APPLICATION PROCEDURES**

|  |
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| * Open positions will be posted by the company on various platforms such as their website, Indeed.com, Craigslist.com, NH Job Match System, ApprenticeshipNH, and apprenticeship.gov.
 |
| * ApprenticeshipNH will offer host information sessions if requested and assist with helping to advertise any open positions.
 |
| * Interested candidates will be asked to complete a standardized job application.
 |
| * Candidates meeting or exceeding the minimum qualifications will be invited to interview.
 |
| * All completed applications are tracked and managed internally by Human Resources (HR) utilizing an ATS or similar tracking system.
 |
| * Applicants invited to participate in the selection process will be notified via text, email or telephone.
 |
| * Applicants who do not meet the minimum qualifications, will receive a letter from HR notifying them that they were not selected for an interview.
 |

**SECTION II – SELECTION PROCEDURES**

The sponsor has adopted the following selection procedures, consistent with the requirements set forth in 29 CFR § 30.10(b):

|  |
| --- |
| * Interviews will be scheduled by HR or the receptionist.
 |
| * Initial interviews will be conducted as a phone screening conducted by HR or company representative.
 |
| * All applicants will be asked standardized questions.
 |
| * All applicants will be scored using a standardized scoring system.
 |
| * Second interviews will be an in-person meeting with the Service Manager or company representative.
 |
| * All applicants will be asked the same questions and scored on the same standardized scoring system.
 |
| * Answers will be written down and kept in ATS or a similar tracking spreadsheet for at least 5 years.
 |
| * The Service Manager or company representative will evaluate the notes and observations from each interview and complete a rating scale to select candidates.
 |
| * Selected candidates will be notified verbally, then sent a written job offer will be sent via email or USPS upon request.
 |
| * Upon acceptance, candidates will go to a third-party background screening vendor to have the drug screening, background check, motor vehicle record check and 2 professional references completed.
 |

**WORK PROCESS SCHEDULE**

**Automotive Technician Specialist**

**O\*NET/SOC CODE: 49-3032-02 RAPIDS CODE: 1034CB**

**Work Process Schedule: Approximate Hours:**

|  |  |
| --- | --- |
| **Safety** | **100-200** |
| * Identify shop hazards and explain the necessary steps to avoid personal injury or property damage.
 |  |
| * Demonstrate the correct use of safety equipment such as safety glasses, fire extinguishers and how to properly lift a heavy object.
 |
| * Identify ad define hazardous materials.
 |
| * Apply federal, state and local regulations when storing and disposing of chemical materials and waste.
 |
| **Suspension and steering** | **450-900** |
| * Steering Systems Diagnosis and Repair
 |  |
| * Suspension Systems Diagnosis and Repair
 |
| * Wheel Alignment Diagnosis Adjustment and Repair
 |
| * Wheel and Tire Diagnosis and Repair
 |
| **Brakes** | **750-1500** |
| * Hydraulic System Diagnosis and Repair
 |  |
| * Drum Brake Diagnosis and Repair
 |
| * Disk Brake Diagnosis and Repair
 |
| * Powers assist unit’s diagnosis and repair
 |
| * Miscellaneous (Wheel bearings, parking brakes, electrical, etc.) Diagnosis and Repair
 |
| * Anti Lock brake system
 |
| **Electrical/Electronic Systems** | **400-800** |
| * General/Electrical Systems Diagnosis
 |  |
| * Battery Diagnosis and Service
 |
| * Starting system diagnosis and repair
 |
| * Charging system diagnosis and repair
 |
| * Lighting systems diagnosis and repair
 |
| * Gauges, warning devices and driver information systems diagnosis and repair
 |
| * Horn and wiper/washer diagnosis and repair
 |
| * Accessories diagnosis and repair
 |
| **Engine Performance** | **300-600** |
| * General Engine Diagnosis
 |
| * Computerized Engine Controls Diagnosis and Repair
 |
| * Ignition System Diagnosis and Repair
 |
| * Fuel, Air induction and Exhaust systems diagnosis and repair
 |
| * Emissions Control Systems Diagnosis and Repair
 |
| * Engine related Services
 |

**Related Instruction**

**Automotive Technician Specialist**

O\*NET/SOC CODE: 49-3023.02 RAPIDS CODE: 1034CB

**Related Training Provider(s):** Great Bay Community College, Lakes Region Community College, Manchester Community College, and White Mountains Community College

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Each employer in the NH Automobile Dealers Association consortium will determine which Community College’s related instruction will be used.



**Related Instruction Training Outline: Approximate Hours:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Class Number** | **Class Name** | **Credits** | **Hrs/Wk****Class** | **Hrs/Wk****Lab** | **Total****Hours** |
| AUTO 110G | Automotive Maintenance & Light Repair | 3 | 2 | 3 | 80 |
| AUTO 125G | Automotive Electronics 1 | 4 | 3 | 3 | 96 |
| **TOTAL MINIMUM HOURS** | **176** |

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| Course Curriculum Outline or Course Descriptions: |
| AUTO 110G | **Automotive Maintenance & Light Repair** |
| The Maintenance & Light Repair course prepares students for entry into the automotive repair industry. Students explore career opportunities and requirements of a professional service technician. Content emphasizes beginning transportation service skills and workplace success skills. Student study safety, tools, equipment, shops operations, vehicle fundamentals and basic technician skills. Instruction will incorporate hands-on lab work, discussion, demonstration, lecture and assigned readings. Upon completion of the course, students will be eligible to take the MLR ASE Student Certification Exam. |

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| --- |
| Learning Objectives: |
| 1. Explain and apply shop safety rules and procedures
 |
| 1. Given a task in an automotive application, identify the correct hand tool or power tool for the job, and demonstrate safe use and care
 |
| 1. Determine information required to complete a service order, locate service information and follow standard operating procedures
 |
| 1. Ensure vehicle is prepared to return to customer per school/company policy
 |
| 1. Demonstrate ability to complete fundamental service requirement of the following automotive systems: engines, transmissions and transaxles, manual drive trains and axles, braking, suspension and steering, electrical, HVAC and computer
 |
| 1. Demonstrate ability to work independently, and with others, including coworkers, instructors, and customers.
 |
| AUTO 125G | **Automotive Electronics 1** |
| This course will introduce the student to general vehicle electrical and electronic principles, theory and components. Topics include: Ohm’s Law, circuit analysis, basic circuits, diodes, transistors, relays and solenoids. The lab will use electrical test equipment to analyze and troubleshoot basic electrical circuits including warning systems, electrical accessories, battery, starting and charging systems. |
| Learning Objectives: |
| 1. Identify and research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
 |
| 1. Explain and provide examples of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm’s Law).
 |
| 1. Demonstrate proper use of digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance.
 |
| 1. Explain, compare and contrast causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.
 |
| 1. Check operation of electrical circuits with a test light.
 |
| 1. Check operation of electrical circuits with fused jumper wires.
 |
| 1. Use wiring diagrams, diagnosis (troubleshoot) electrical/electronic circuit problems.
 |
| 1. Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine necessary action
 |
| 1. Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.
 |
| 1. Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; determine necessary action.
 |
| 1. Replace electrical connectors and terminal ends.
 |
| 1. Repair wiring harness.
 |
| 1. Perform solder repair of electrical wiring.
 |
| 1. Perform battery state-of-charge test; determine necessary action.
 |
| 1. Confirm proper battery capacity for vehicle application; perform battery capacity test; determine necessary action.
 |
| 1. Maintain or restore electronic memory functions.
 |
| 1. Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs.
 |
| 1. Perform slow/fast battery charge according to manufacturer’s recommendations.
 |
| 1. Jump-start vehicle using jumper cables and a booster batter or an auxiliary power supply.
 |
| 1. Identify high-voltage circuits of electric or hybrid vehicle and related safety precautions.
 |
| 1. Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.
 |
| 1. Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures.
 |
| 1. Perform starter current draw tests; determine necessary action.
 |
| 1. Perform starter circuit voltage drop tests; determine necessary action.
 |
| 1. Inspect and test starter relays and solenoids; determine necessary action.
 |
| 1. Remove and install starter in a vehicle.
 |
| 1. Inspect and test switches, connectors, and wires of starter control circuits, determine necessary action.
 |
| 1. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.
 |
| 1. Charging System Diagnosis and Repair 1. Perform charge output test; determine necessary action.
 |
| 1. Diagnose (troubleshoot) charging system for causes of undercharge, or no charge.
 |
| 1. Inspect, adjust, or replace generator (alternator) drive belts; check pulleys and tensioners.
 |
| 1. Remove, inspect, and re-install generator(alternator).
 |
| 1. Perform charging circuit voltage drop tests; determine necessary action. Light operation; determine necessary action.
 |
| 1. Diagnose (troubleshoot) the causes of brighter-than-normal, intermittent, dim, or no light operation; determine necessary action.
 |
| 1. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed.
 |
| 1. Aim headlights
 |
| 1. Identify system voltage and safety precautions associated with high intensity discharge headlights.
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| **Class Number** | **Class Name** | **Credits** | **Hrs/Wk****Class** | **Hrs/Wk****Lab** | **Total****Hours** |
| AUTO 120L | Introduction to Automotive Service | 3 | 2 | 4 | 96 |
| AUTO 125L | Electrical/Electronics 1 | 4 | 3 | 5 | 128 |
| **TOTAL MINIMUM HOURS** | **224** |

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| Course Curriculum Outline or Course Descriptions: |
| AUTO 120L | **Introduction to Automotive Service** |
| This course is the first of a series of courses that make up the Automotive Technology track. It provides instruction in career opportunities, safety, Oxy-Acetylene usage, measurement, proper tool usage and service operations and basic maintenance including tire service, safety inspections, light engine repair and brake work.  |
| Learning Objectives: |
| 1. Be able to identify learning needs and construct activities to attain growth through self-directed lifelong learning.
 |
| 1. Be able to safely perform routine diagnostics, service and repair on today’s modern cars and light trucks.
 |
| 1. Be able to safely diagnose and repair the integrated systems used on today’s advanced vehicles.
 |
| 1. 2018 MLR Task List & NATEF/ASE Supplemental Tasks
 |
| AUTO 128L | **Electrical/Electronics 1** |
| In this course, students study electrical and electronics theory including the application of Ohms Law and Kirchhoff’s Law to the solution of electrical and electronic concerns, wiring schematics and symbols; series and parallel circuits; the use of multi-meters, logic probes, oscilloscopes and graphing multimeters; wiring repair, electronic component and devices; batter, charging and starting systems. |
| Learning Objectives:  |
| 1. Explain the design features and characteristics of starting and charging systems.
 |
| 1. Explain the ignition systems and engines.
 |
| 1. Perform diagnostic, service and repair procedures
 |
| 1. Overall Learning Outcomes with Final Skill Performances:
2. Instructional Units 1: (623) Circuit Board Electrical Diagnostics and Battery
3. Learning outcome: circuit board analysis
4. FSP (skills): circuit building and DVOM measurements
5. FSP (skills): circuit tracing and analysis
6. Learning outcome: battery testing and diagnosis
7. FSP (skills): battery load test using GR8 and carbon pile tester
8. FSP (skills): alternator output test (correlates to 3a)
9. Instructional Units 2(652) Electrical Diagnosis without Multiplex Capstone
10. Learning outcome: voltage drop diagnosis without multiplex
11. FSP (skills): diagnosing accessory system faults on non-multiplex circuits
12. FSP (skills): voltage drop diagnosis without multiplex
13. Instructional Unit 3: (623,652,901,673) Voltage Drop Diagnosis with Multiplex and Starting and Charging
14. Learning outcome: starting and charging systems diagnosis
15. FSP (skills): starter voltage drop diagnosis
16. FSP (skills): starter current draw test
17. Learning outcome: voltage drop diagnosis with multiplex
 |
| 1. FSP (skills): voltage drop diagnosis with multiplex
 |
| 1. 5ASE Educational Foundation – A6 Electrical Tasks
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| --- | --- | --- | --- | --- | --- |
| **Class Number** | **Class Name** | **Credits** | **Hrs/Wk****Class** | **Hrs/Wk****Lab** | **Total****Hours** |
| AUTO 1011M | Maintenance & Light Repair | 4 | 2 | 8 | 160 |
| AUTO 1012M | Electrical Systems | 6 | 3 | 9 | 176 |
| **TOTAL MINIMUM HOURS** | **336** |

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| Course Curriculum Outline or Course Descriptions: |
| AUTO1011M | **Maintenance & Light Repair** |
| AUTO1011M is a comprehensive face-to-face course covering all aspects of general vehicle maintenance and light repair of the latest automobiles and light trucks. Topics include safety, customer service relations, repair documentation, service-department operations, safety inspection, pre-delivery inspection, in-depth preventative maintenance and inspection and common general repairs. Using the various skills and knowledge learned, students will perform the same basic tasks on today’s automobiles as an express lane maintenance technician would in a dealership. Tools identified on the student tool list are required for this course. |
| Learning Objectives: |
| 1. The students will demonstrate sound customer relationship management techniques during all aspects of the course.
 |
| 1. The students will practice safe work habits and safe equipment and tool usage while performing general maintenance and light repair of engine, transmission drivetrain, suspension, steering, heating, air conditioning, electrical and related systems.
 |
| 1. Using electronic service information sources, the students will research service maintenance information necessary to complete general maintenance and light repair of engine, transmission, drivetrain, suspension, steering, heating, air conditioning, and electrical related systems.
 |
| 1. Using assigned vehicles, the students will inspect general engine, transmission, drivetrain, suspension, steering, air conditioning, electrical and related systems.
 |
| 1. Using assigned vehicles, the students will diagnose and test general engine transmission, drivetrain, suspension, steering, heating, air conditioning, electrical and related systems.
 |
| 1. Using assigned vehicles, the students will perform general repairs of engine, transmission, drivetrain, suspension, steering, heating, air conditioning, electrical and related systems.
 |
| 1. Using assigned vehicles, the students will perform general maintenance of engine, transmission, drivetrain, suspension, steering, heating, air conditioning, electrical, and related systems.
 |
| AUTO1012M | **Electrical Systems** |
| AUTO1012M is a comprehensive face-to-face course covering all aspects of the theory and diagnosis of basic electrical systems of the latest automobiles and light trucks. Topics include: electrical safety, basic electrical theory and electrical systems, circuit diagrams, magnetism, induction, battery technology, semiconductors automotive electrical systems, electric circuit repair techniques, digital multi meter and other diagnostic equipment, and diagnostic techniques. Using the various skills and knowledge learned, students will perform basic electrical system inspection, diagnosis and repairs on today’s automobiles. Tools identified on the student tool list are required for this course. |
| Learning Objectives: |
| 1. The students will practice safe work habits and safe equipment and tool usage while performing inspection, diagnosis and repair of electrical and related systems.
 |
| 1. The students will demonstrate knowledge of electrical systems theory, inspection, diagnosis and repair techniques.
 |
| 1. Using electronic service information sources, the students will research information necessary to complete inspection, diagnosis and repair of electrical and related systems.
 |
| 1. Using assigned vehicles, the students will inspect electrical and related systems.
 |
| 1. Using assigned vehicles, the students will diagnose and test electrical and related systems.
 |
| 1. Using assigned vehicles, the students will perform general repairs and maintenance of electrical and related systems.
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| --- | --- | --- | --- | --- | --- |
| **Class Number** | **Class Name** | **Credits** | **Hrs/Wk****Class** | **Hrs/Wk****Lab** | **Total****Hours** |
| AUTO 121N | Automotive Service & Maintenance | 4 | 2 | 4 | 96 |
| AUTO 113N | Automotive Electricity & Wiring | 3 | 2 | 3 | 80 |
| **TOTAL MINIMUM HOURS** | **176** |

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| Course Curriculum Outline or Course Descriptions: |
| AUTO 121N | **Maintenance & Light Repair** |
| The study and development of skills in automotive maintenance and preventative maintenance procedures such as engine lubrication, exhaust systems, cooling systems, tire rotation and balance, NH state motor vehicle inspection procedures, engine drive belt, thread repair and Oxy/acetylene torches. A student must earn a “C” or better to achieve a passing grade in this course. This course includes a service learning opportunity. |
| Learning Objectives: |
| 1. Recognize and apply the safety procedures involved in the service and repair of automobile chassis systems.
 |
| 1. Apply the proper procedures in using the oxygen acetylene torch.
 |
| 1. Perform new vehicle destination service and NH state motor vehicle inspection.
 |
| 1. Analyze and apply the proper procedures for using the black light for fluid leak detection.
 |
| AUTO 113N | **Automotive Electricity & Wiring** |
| Learning Objectives: |
| 1. Recognize how electricity is created and the relationships between electrical voltage, current flow and electrical resistances.
 |
| 1. Recognize, apply and analyze the theory of automotive electrical systems and the diagnosis and troubleshooting of these systems.
 |
| 1. Recognize, apply and analyze wiring procedures, reading wiring diagrams, and repair techniques for electrical harness and components.
 |
| 1. Understand basic electrical principles as applied to the different types of circuits.
 |
| 1. Analyze circuits using Ohm’s Law and related formulas.
 |
| 1. Become proficient at reading wiring diagrams and service manuals.
 |
| 1. Develop skill in the use of electrical test equipment.
 |
| 1. Build experience and competence in the troubleshooting of electrical problems on vehicles.
 |
| 1. Demonstrate knowledge of the design and function of starting and charging systems
 |
| 1. Develop safe working habits and respect for equipment and shop management.
 |

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| --- | --- | --- | --- | --- | --- |
| **Class Number** | **Class Name** | **Credits** | **Hrs/Wk****Class** | **Hrs/Wk****Lab** | **Total****Hours** |
| AUTO 101W | Introduction to Automotive Service | 3 | 2 | 3 | 40 |
| AUTO 113N | Automotive Electricity & Wiring | 3 | 2 | 3 | 80 |
| **TOTAL MINIMUM HOURS** | **176** |

|  |
| --- |
| Course Curriculum Outline or Course Descriptions: |
| AUTO 101W | **Introduction to Automotive Service** |
| This course provides a comprehensive study of the basics in automobile technology including safety, precision measuring, and the proper use of tools and equipment. Students will also learn how to use computerized information systems and lab procedures and policies. |
| Learning Objectives: |
| 1. Develop a safety plan
 |
| 1. Perform basic vehicle maintenance
 |
| 1. Distinguish different hand tools
 |
| 1. Perform cooling system tests
 |
| 1. Calculate measurements using precision measurement tools
 |
| 1. Explain exhaust system components.
 |
| 1. Distinguish different lubrication systems
 |
| 1. Demonstrate proper lab procedures
 |
| 1. Perform vehicle lifting procedures
 |
| AUTO 112W | **Automotive Electricity I** |
| A study of electricity as it is applied to today’s automobile. This course will include the theory of electricity, the study of magnetism and electrical circuits, and the theory and service of batteries, starters and charging systems. |
| Learning Objectives: |
| 1. Explain and demonstrate how a modern ignition system functions.
 |
| 1. Diagnose and repair ignition systems
 |
| 1. Discover the importance of computers and wiring diagrams
 |
| 1. Diagnose and repair computer issues.
 |
| 1. Read and interpret wiring diagrams
 |
| 1. Distinguish the difference between pulse width and duty cycles
 |
| 1. Explain and demonstrate how a modern fuel injection systems works
 |
| 1. Properly diagnose modern fuel injection systems
 |
| 1. Recognize the importance and function of fuel injection sensors
 |
| 1. Perform lab scope tests and functions
 |