Automotive Technology Program

Program Coordinator: Milton Ayakawa  
Location: ET 101C  
Phone: (808) 455-0439  
Email: mayakawa@hawaii.edu

CTE Counselor: Blake Hunrick  
Location: GT 111  
Phone: (808) 455-0652  
Email: hunrick@hawaii.edu

The goals of the program are:

• to prepare students with the skills and competencies necessary for a successful career as an automotive technician;
• to instill in students the work habits and attitudes necessary to work in a highly competitive field; and
• to provide students with the basic skills necessary to become lifelong learners in order to keep abreast of the latest technological changes in the automotive field.

In order to promote a student's readiness and success, prerequisites have been established for each AMT certificate and degree and for AMT courses. The competencies students are expected to achieve in the AMT program are based on the tasks prescribed by National Automotive Technician Education Foundation (NATEF) and the National Institute for Automotive Service Excellence (ASE) for technician certification.

Entering students must purchase or provide a basic tool set and uniform as prescribed by the program. Cost is approximately $2200. Additionally, most courses have textbook requirements.

The programs in Automotive Technology are accredited by the National Automotive Technicians Education Foundation (NATEF), 101 Blue Seal Drive, S.E. Suite 101, Leesburg, VA 20175, (703) 669-6650. To file a complaint with NATEF, email webmaster@natef.org or visit www.natef.org.

Recommended high school preparation: Pre-Algebra, Electronics, Chemistry or Physics, Industrial Arts.

Ford ASSET Option

Automotive Student Service Educational Training (ASSET) is a Statewide program sponsored by Ford Motor Company, Ford and Lincoln/Mercury Dealers and Leeward CC. It is a two-year program designed to develop entry-level service technicians for Ford and Lincoln/Mercury dealerships. ASSET provides the student with a unique two-year work-study experience which leads to an Associate in Applied Science Degree (64 credits) in Automotive Technology.

The ASSET program is designed to provide Ford and Lincoln/Mercury dealerships with qualified technicians proficient in the latest automotive service technologies and methods. In addition, the program enables graduates to make advancements in their career paths. The cost of tools and supplies is approximately $2,000. Students interested in enrolling in ASSET should see the AMT ASSET Instructor.

Automotive Technology Degrees and Certificates

Automotive Technology: Associate in Applied Science

Description

The Associate in Applied Science Degree is awarded to students who successfully complete both the required AMT and general education courses with a grade of C or better. The AAS degree enables students to enter the workforce. Graduates are able to seek employment in multiple areas in the automotive industry or related technical fields.
Program Learning Outcomes

Upon completion of the program, students will be able to do the following:

- Demonstrate the professional skills and knowledge required in the automotive industry.
- Apply safety procedures required in shop practices.
- Employ principles necessary for practical applications within the automotive industry.

Contact Information

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Program: Automotive Technology
Type: Associate in Applied Sciences (AAS)

Semester 1

<table>
<thead>
<tr>
<th>Item #</th>
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<tbody>
<tr>
<td>AMT 100</td>
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<td>AMT 141</td>
<td>Electrical/Electronic Systems I</td>
<td>5</td>
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<tr>
<td>AMT 152</td>
<td>Brake Systems</td>
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<td>AMT 162</td>
<td>Advanced Brake Systems</td>
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Semester 2

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<td>AMT 129</td>
<td>Engine Repair</td>
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<td>AMT 154</td>
<td>Suspension and Steering Systems</td>
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<td>AMT 164</td>
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<tr>
<td></td>
<td>AMT 145</td>
<td>Manual Drive Trains and Axles</td>
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<td></td>
<td>AMT 149</td>
<td>Automatic Transmissions and Transaxles</td>
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<tr>
<td></td>
<td>AMT 241</td>
<td>Electrical/Electronic Systems II</td>
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<td></td>
<td>Natural Science (100 level or above)</td>
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<tr>
<td></td>
<td>AMT 144</td>
<td>Heating and Air Conditioning</td>
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<td>AMT 245</td>
<td>Engine Performance Systems</td>
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<td>Social Sciences (100 level or above) - CTE</td>
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Total credits for degree: 60-61

Automotive Technology: Certificate of Achievement

Description

The Certificate of Achievement is awarded to students who successfully complete the first two semesters of Leeward CC’s Automotive Technology (AMT) program. Students earning this certificate have demonstrated the knowledge and skills required to enter the automotive industry with the goal of becoming an automotive technician.

Program Learning Outcomes

Upon completion of the program, students will be able to do the following:

- Demonstrate the professional skills and knowledge required in the automotive industry.
- Apply safety procedures required in shop practices.
- Employ principles necessary for practical applications within the automotive industry.

Contact Information

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CTE Counselor: Blake Hunrick  
Location: GT 111  
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Email: hunrick@hawaii.edu

**Program:**  
Automotive Technology  
**Type:**  
Certificate of Achievement (CA)

### Semester 1

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**Total credits for degree:** 30

### Automotive Technology: Certificate of Competence

**Description**

The Certificate of Competence is awarded to students who successfully complete the first semester of Leeward CC’s Automotive Technology (AMT) program. Students earning this certificate will be able to obtain an entry-level position in the automotive repair industry.

**Program Learning Outcomes**

Upon completion of the program, students will be able to do the following:

- Demonstrate the professional skills and knowledge required in the automotive industry.
• Apply safety procedures required in shop practices.
• Employ principles necessary for practical applications within the automotive industry.

Contact Information

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CTE Counselor: Blake Hunrick
Location: GT 111
Phone: (808) 455-0652
Email: hunrick@hawaii.edu

Program: Automotive Technology
Type: Certificate of Competence (CO)

Course Requirements

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Total credits for degree: 15

Automotive Technology Classes

**AMT 20: Introduction to Automotive Mechanics**
An introductory course to the automotive service/repair industry and Standard Operating Procedures (SOP) for the AMT program. Principles of system operation, equipment usage, and safety practices are applied to preventive maintenance, inspection and service. Students participating in the AMT program are required to have a valid driver's license. Verification of its validity will be made during class; anyone without a current driver's license will be disenrolled. A tool set as listed by Leeward CC's AMT program must be purchased within the first three weeks of class.

Credits: 2
Prerequisites: MATH 100 or QM 107C with a grade of C or better or equivalent or concurrent enrollment.
Program: Automotive Technology

**AMT 30: Engines**
Covers the theory of design and operation of internal combustion engines in current production automobiles. The course provides training in repair, overhaul, reconditioning, and troubleshooting of internal components and related subsystems. Students participating in the AMT program are required to have a valid driver's license. Verification of its validity will be made during class; anyone without a current driver's license will be disenrolled. A tool set as listed by Leeward CC's AMT program is required.
AMT 40: Electrical/Electronic Systems I
Explains the concepts and theories of automotive electrical/electronic devices and circuits. Areas of study include: starting, charging, ignition, fuel, lighting, and accessories. Emphasis is placed on the application of principles to evaluate components based on measurements obtained from specialized equipment. Students participating in the AMT program are required to have a valid driver’s license. Verification of its validity will be made during class; anyone without a current driver’s license will be disenrolled. A tool set as listed by Leeward CC's AMT program is required. (60 lecture; 90 lab hours)

Credits: 7
Prerequisites: AMT 20, AMT 40, AMT 53 with a grade of C or better and ENG 100 with a grade of C or better or equivalent or concurrent enrollment.
Program: Automotive Technology

AMT 40D: Engine Performance
Examines the operation and relationships of engine, ignition, air/fuel induction, emission, and computerized control systems. Diagnostic procedures are covered using test equipment. These include distributor testers, oscilloscopes, gas analyzers, scan tools, and specialized meters. Students participating in the AMT program are required to have a valid driver's license. Verification of its validity will be made during class; anyone without a current driver's license will be disenrolled. A tool set as listed by Leeward CC's AMT program is required.

Credits: 9
Prerequisites: AMT 20, AMT 30, AMT 40, AMT 41, AMT 46, AMT 50, AMT 53, AMT 55 with a grade of C or better. Social Science 100 level and Arts & Humanities 100 level course with a grade of C or better or concurrent enrollment.
Program: Automotive Technology

AMT 41: Electrical/Electronic Systems II
An advanced course in problem diagnosis and trouble-shooting of semi-conductor components and related circuits. This course provides explanations of operating parameters for electronic sensors, actuators, control modules, and automotive on-board computers.

Credits: 3
Prerequisites: AMT 20, AMT 30, AMT 40, AMT 46, AMT 50 with a grade of C or better. AMT 46 and AMT 50 with a grade of C or better or concurrent enrollment.
Program: Automotive Technology

AMT 50: Automatic Transmissions and Transaxles
Explains the fundamental principles of automatic transmission design and operation found on Front Wheel Drive (FWD) and Rear Wheel Drive (RWD) automobiles. Service, repair, and overhaul procedures are included for a variety of import and domestic automatic transmissions. Students participating in the AMT program are required to have a valid driver's license. Verification of its validity will be made during class; anyone without a current driver's license will be disenrolled. A tool set as listed by Leeward CC's AMT program is required.

Credits: 6
Prerequisites: AMT 20, AMT 30, AMT 40, AMT 53, and AMT 55 with a grade of C or better. AMT 46 with a grade of C or better or concurrent registration. MATH 100 or QM 107C with a grade of C or better or equivalent or concurrent enrollment. Natural Science 100 level or higher with a grade of C or better or concurrent enrollment.

AMT 53: Brakes
Explains design requirements and reconditioning practices of automotive brakes. Various mechanical, hydraulic, vacuum, and electrical/electronic principles are applied to troubleshooting, servicing and repairing of drums, discs, power assist units, parking, and Anti-lock Braking Systems (ABS). Students participating in the AMT program are required to have a valid driver's license. Verification of its validity will be made during class; anyone without a current driver's license will be disenrolled. A tool set as listed by Leeward CC's AMT program is required.

Credits: 4
Prerequisites: AMT 20 and AMT 40 with a grade of C or better or concurrent registration. MATH 100 or QM 107C with a grade of C or better or equivalent or concurrent enrollment.

AMT 55: Suspension and Steering
Explains the theory and practical application of the operation, problem diagnosis, maintenance and repair of the modern suspension and steering systems to include: front wheel drive steering and suspension systems; rear wheel drive steering and suspension systems; four wheel drive steering and suspension systems; and all wheel drive steering and suspension systems. Wheel alignment and tire servicing for all systems are also covered. Students participating in the AMT program are required to have a valid driver's license. Verification of its validity will be made during class; anyone without a current driver's license will be disenrolled. A tool set as listed by Leeward CC's AMT program is required.

Credits: 5
Prerequisites: AMT 20, AMT 40 and AMT 53 with a grade of C or better. AMT 30 with a grade of C or better or concurrent enrollment. ENG 100 with a grade of C or better or equivalent or concurrent enrollment.

AMT 93D: Cooperative Education
This cooperative training experience will provide students an opportunity to apply their professional and technical skills in dealership service centers. Students will be supervised on the job by a professional Journeyman Technician. Students will complete 225 hours per training experience. This course may be repeated up to four times, for a maximum of 15 credits.

Credits: 3
Prerequisites: AMT 100, AMT 141 and AMT 144 with a grade of C or better

AMT 100: Introduction to Automotive Technology
This course will cover policies and procedures of the Automotive Technology (AMT) program, various career opportunities in the automotive field, shop safety, proper use of technical reference manuals, and identifying and proper use of basic hand tools and precision measuring tools. (Formerly AMT 20)

Credits: 2
Prerequisites: MATH 100 or higher or equivalent or QM 107C or higher or equivalent with a grade of C or better or concurrent enrollment

Program: Automotive Technology
AMT 129: Engine Repair
This course will cover shop safety, tools and all components found in the modern internal combustion engine. The course is designed to provide students with an understanding of the fundamental operation and construction of internal combustion engines. Instruction will include theory and laboratory (shop) activities in which students will learn how to inspect, service, maintain, diagnose, and repair automobile engine malfunctions. This course includes live work. (Formerly AMT 30)

Credits: 7
Prerequisites: AMT 100, AMT 141 and AMT 152 with a grade of C or better and ENG 100 or higher or equivalent with a grade of C or better or concurrent enrollment
Program: Automotive Technology

AMT 141: Electrical/Electronic Systems I
This course will provide students with fundamental principles of automotive electricity and electronics. Practical skills to diagnose, test, and service battery, starting, charging and lighting systems are covered. Testing and repair of electrical safety devices, wiring, connectors, and relays are also covered. (Formerly AMT 40)

Credits: 5
Prerequisites: AMT 100 with a grade of C or better or concurrent enrollment and MATH 100 or higher or equivalent or QM 107C or higher or equivalent with a grade of C or better or concurrent enrollment
Program: Automotive Technology

AMT 144: Heating and Air Conditioning
This course provides an understanding of the theory, diagnosis, service, safe handling of refrigerants and repair of automotive heating, ventilation and air conditioning (HVAC) systems. The course presents the operation and function of vacuum, electrical, refrigeration circuits, and computer controls. Training is provided in the use of tools and equipment while performing diagnostics, repairs, and service on HVAC systems. (Formerly AMT 43)

Credits: 4
Prerequisites: AMT 100, AMT 129, AMT 141, AMT 145, AMT 149, AMT 152, AMT 154 and AMT 241 with a grade of C or better and MATH 100 or higher or equivalent or QM 107C or higher or equivalent with a grade of C or better or concurrent enrollment
Program: Automotive Technology

AMT 145: Manual Drive Trains and Axles
This course covers the theory and fundamental operating principles of the modern automotive drive trains and axles. Students learn maintenance and repair of C-V shafts, propeller shafts, clutch systems, standard transmissions, standard transaxles, all-wheel drive, four-wheel drive, and final-drive systems. (Formerly AMT 46)

Credits: 4
Prerequisites: AMT 100, AMT 129, AMT 141, AMT 152 and AMT 154 with a grade of C or better and MATH 100 or higher or equivalent or QM 107C or higher or equivalent with a grade of C or better or concurrent enrollment and Natural Science 100 level with a grade of C or better or concurrent enrollment
Program: Automotive Technology

AMT 149: Automatic Transmissions and Transaxles
This course covers the fundamental principles of automatic transmission design and operation found on Front Wheel Drive (FWD) and Rear Wheel Drive (RWD) automobiles. Service, repair, and overhaul procedures are included for a variety of import and domestic automatic transmissions. (Formerly AMT 50)

Credits: 4
Prerequisites: AMT 100, AMT 129, AMT 141, AMT 152 and AMT 154 with a grade of C or better and MATH 100 or higher or equivalent or QM 107C or higher or equivalent with a grade of C or better or concurrent enrollment and AMT 145 with a grade of C or better or concurrent enrollment
Program: Automotive Technology

AMT 152: Brake Systems
This course covers the principles in the operation of the modern automotive brake systems. Further development in new technology such as computerized ABS (Anti-skid Brake Systems), electronic power brakes, and four-wheel disc brakes will be covered. Repair and service techniques of the complete brake systems will be demonstrated. (Formerly AMT 53)
AMT 154: Suspension and Steering Systems
This course presents the theory and practical application of the operation, problem diagnosis, maintenance and repair of the modern suspension and steering systems to include: front wheel drive steering and suspension systems; rear wheel drive steering and suspension systems; four wheel drive steering and suspension systems; and all-wheel drive steering and suspension systems. Wheel alignment and tire servicing for all systems are also covered. (Formerly AMT 55)

Credits: 4
Prerequisites: AMT 100 and AMT 141 with a grade of C or better or concurrent enrollment and MATH 100 or higher or equivalent or QM 107C or higher or equivalent with a grade of C or better or concurrent enrollment
Co-Requisites: AMT 162
Program: Automotive Technology

AMT 162: Advanced Brake Systems
This course is a continuation of AMT 152 Brake Systems with a more detailed examination of the modern technologies of current production electronic braking systems. Professional level diagnostic procedures and techniques will be emphasized.

Credits: 1
Co-Requisites: AMT 152
Program: Automotive Technology

AMT 164: Advanced Suspension and Steering Systems
This course is a continuation of AMT 154 with a detailed examination of the modern technologies of current production electronic suspension and steering systems. Professional level diagnostic procedures and techniques will be emphasized.

Credits: 1
Co-Requisites: AMT 154
Program: Automotive Technology

AMT 241: Electrical/Electronic Systems II
This course covers essential theories and practical skills in diagnosing electronic control systems, networking, and the repair of automotive accessory circuits such as power windows, power door locks, power antennas, power mirrors, audio systems, anti-theft systems, power seats, horns, blower fan, and wiper/washer. Also covered are conventional instrumentation, digital instrumentation, supplemental inflatable restraint (SRS), and high voltage systems. (Formerly AMT 41)

Credits: 4
Prerequisites: AMT 100, AMT 129, AMT 141, AMT 152 and AMT 154 with a grade of C or better and MATH 100 or higher or equivalent or QM 107C or higher or equivalent with a grade of C or better or concurrent enrollment and AMT 145 and AMT 149 with a grade of C or better or concurrent enrollment
Program: Automotive Technology

AMT 245: Engine Performance Systems
Examines the theory, operation and relationships of engine, ignition, air induction, fuel delivery, emission and computerized control systems. Diagnostic procedures are covered using professional service information and test equipment. These include oscilloscopes, gas analyzers, scan tools, and specialized meters. (Formerly AMT 40D)

Credits: 8
Prerequisites: AMT 100, AMT 129, AMT 141, AMT 241, AMT 145, AMT 149, AMT 152, AMT 154, AMT 162 and AMT 164 with a grade of C or higher and AMT 144 with a grade of C or higher or concurrent enrollment
Program: Automotive Technology