

# Automotive/Diesel Technology (ADT)

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## Courses

### ADT A100 Pre-Commercial Driving License 2 Credits

Prepares students to pass the State of Alaska Commercial Drivers License Permit. Includes basics on inspections, air brakes, and combination vehicles.

**Special Note:** A DOT Medical card is not required for a Commercial Learner's Permit, but it is required for a Commercial Driver's License.

**Registration Restrictions:** Must be 18 years of age to enroll in class.

### ADT A101 Commercial Drivers Training 1 Credit

Provides beginning Commercial Drivers License instruction for students intending to become commercial drivers.

**Special Note:** Must be 18 years old and obtain a Department of Transportation (DOT) medical certificate to meet the requirements for a Commercial Drivers License.

**Registration Restrictions:** Department approval with prior possession of the written Commercial Driver License permit

**Prerequisites:** ADT A100 with a minimum grade of P.

### ADT A102 Introduction to Automotive Technology 3 Credits

Provides career information about the automotive industry. Covers shop safety, hand tools, fasteners, fittings, and an introduction to the major automotive systems.

### ADT A121 Basic Electrical Systems 3 Credits

Covers basic automotive and heavy-duty equipment electrical theory, diagnosis, minor repair, and general service of alternators, starters, and batteries.

**Special Note:** Students are expected to provide the basic hand tools needed to participate in lab activities. See faculty advisor for tool list.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment.

### ADT A122 Engine Theory and Diagnosis 3 Credits

Introduces the fundamental aspects of engine theory, design, operation, general diagnosis and engine-related service. Includes an introduction of combustion process, engine mechanics and associated engine systems.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment.

### ADT A131 Auto Electrical II 3 Credits

Theory, diagnosis and repair of automotive and heavy-duty electrical systems, to include testing tools, schematics, and computer inputs and outputs.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment and ADT A121 with a minimum grade of C or concurrent enrollment.

### ADT A140 Automotive Engine Repair 3 Credits

Apply skills essential to diagnose, repair, overhaul, and recondition automotive internal combustion engines. Includes cylinder head, valve train, and engine block service, as well as starting and running the engine.

**Special Note:** A running engine is imperative in industry. Lab engines must run in order to receive a passing grade.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment.

### ADT A150 Brake Systems 4 Credits

Theory, diagnosis and repair of automotive braking systems, including antilock brake systems (ABS).

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment and ADT A121 with a minimum grade of C or concurrent enrollment and ADT A131 with a minimum grade of C or concurrent enrollment.

### ADT A152 Heavy-Duty Suspension and Steering 4 Credits

Introduces theory, operation and maintenance of suspension and steering systems on medium- and heavy-duty trucks and equipment.

**Special Note:** Students are expected to provide the basic hand tools needed to participate in lab activities. See faculty advisor for tool list.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment.

### ADT A153 Medium/Heavy-Duty Diesel Engines 4 Credits

Introduces theory and application of design, operation, diagnosis, disassembly, repair, and service procedures for engines used in medium and heavy-duty trucks and equipment.

**Special Note:** Students are expected to provide the basic hand tools needed to participate in lab activities. See faculty advisor for tool list.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment.

### ADT A155 Heavy-Duty Brake Systems 4 Credits

Introduces theory, operation, diagnosis, repair and service procedure of brake systems on medium- and heavy-duty trucks and equipment.

**Special Note:** Students are expected to provide the basic hand tools needed to participate in lab activities. See faculty advisor for tool list.

**Registration Restrictions:** Completion of ADT A121 and ADT A131 with a minimum grade of C or concurrent enrollment is recommended.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment.

### ADT A156 Heavy-Duty Maintenance and Inspection 3 Credits

Introduces regulations and inspection/maintenance procedures on medium- and heavy-duty trucks and equipment.

**Special Note:** Students are expected to provide the basic hand tools needed to participate in lab activities. See faculty advisor for tool list.

**Registration Restrictions:** Must be eligible to enroll in WRTG A090 and MATH A055.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment.

**ADT A160 Manual Drive Trains and Axles 4 Credits**

Introduces theory, diagnosis, and repair of manual drive train components and drive axles. Content includes clutches, manual transmissions and transaxles, 4-wheel drive components, and drive axles.

**Prerequisites:** ADT A102 with a minimum grade of D.

**ADT A162 Suspension and Alignment 4 Credits**

Modern automotive suspension, alignment, and steering theory, inspection, service, and adjustments including four wheel alignment.

**Prerequisites:** ADT A121 with a minimum grade of D.

**ADT A195 Automotive Practicum I 1-6 Credits**

Provides supervised workplace experience in selected industry settings. Integrates knowledge and practice of competencies gained in program coursework.

**Special Note:** May be repeated for a maximum of 18 credits.

**Registration Restrictions:** Recommendation by faculty advisor, at least 12 credits of advisor-approved ADT program technical courses and a valid Alaska driver's license.

**ADT A202 Auto Fuel and Emissions Systems 4 Credits**

Presents design and function of emission control devices, laws and regulations concerning vehicle emissions, combustion chemistry, and volumetric efficiency. Emphasizes proper diagnostic procedures with engine systems, including interfacing with on-board computers, automotive computer networking, and exhaust gas analysis.

**Prerequisites:** ADT A102 with a minimum grade of C and ADT A131 with a minimum grade of C.

**ADT A222 Automotive Engine Performance 4 Credits**

Introduces the relationship between fuel composition, engine design, computerized engine controls, engine control sensors and ignition control systems. Incorporates instructional areas in the Automotive Service Excellence (ASE) Education Foundation task list for the Automotive Engine Performance area.

**Prerequisites:** ADT A102 with a minimum grade of C and ADT A131 with a minimum grade of C.

**ADT A225 Mobile Heating, Ventilation and Air Conditioning Systems 3 Credits**

Presents theory, operation, diagnosis and repair of heating, ventilation and air conditioning (HVAC) systems used in automotive and heavy-duty applications.

**Prerequisites:** ADT A131 with a minimum grade of C.

**ADT A227 Auto Electrical III 3 Credits**

Studies the description, operation and diagnosis of automotive and heavy duty computerized systems. Covers the study of computer inputs, outputs, networks, and programming; including advanced lighting, sensors, instrument cluster gauges, accessories, safety systems, and security systems as well as several other computer control systems and networks.

**Special Note:** Digital Volt Ohm Meter (DVOM) and test light required.

**Prerequisites:** ADT A131 with a minimum grade of D.

**ADT A230 Electric and Hybrid Vehicle I 3 Credits**

Provides an introduction to Electric and Hybrid vehicles. Discusses EV and hybrid history, high voltage batteries, parallel hybrid, series hybrid, series-parallel hybrid, and safety when working around high-voltage systems. Elaborates on maintenance procedures on hybrid and electric vehicles.

**Prerequisites:** ADT A227 with a minimum grade of C or concurrent enrollment.

**ADT A240 Electric and Hybrid Vehicle II 3 Credits**

Introduces students to fundamentals and applied skills essential to diagnosing, maintaining, and repairing EV and hybrid vehicles. Topics include charging diagnostics for Plug-in Hybrid Electric (HEV) and Battery Electric Vehicles (BEV). Includes Electric Vehicle (EV) communication and control systems on BEVs and HEVs.

**Prerequisites:** ADT A230 with a minimum grade of C or concurrent enrollment.

**ADT A260 Electronic and Automatic Transmissions 3 Credits**

Introduces automatic transmission construction and design. Covers hydraulic systems, electronic shift fundamentals, operation of planetary gear-sets, apply mechanism, inspection, servicing, diagnosis, and overhaul. Introduces transmission control module programming, and electronic fault diagnosis. Reinforces theory with practical, hands-on classroom and lab exercises.

**Prerequisites:** ADT A131 with a minimum grade of C.

**ADT A267 Heavy-Duty Diesel Engine Performance 4 Credits**

Covers design, operation, diagnosis, repair and service procedures of engines, fuel systems and emissions systems on engines used in the medium- and heavy-duty diesel industry. Emphasizes engine performance and computer systems diagnosis.

**Special Note:** Students are expected to provide the basic hand tools needed to participate in lab activities. See faculty advisor for tool list.

**Prerequisites:** ADT A131 with a minimum grade of C and ADT A153 with a minimum grade of C.

**ADT A268 Mobile Hydraulic Systems 4 Credits**

Includes diagnosis, repair and service of hydraulic systems and components used on medium- and heavy-duty equipment.

**Special Note:** Students are expected to provide the basic hand tools needed to participate in lab activities. See faculty advisor for tool list.

**Registration Restrictions:** Students are strongly encouraged to complete ADT A121 and ADT A131 prior to enrolling in this course.

**Prerequisites:** ADT A102 with a minimum grade of C.

**ADT A269 Heavy-Duty Drive Trains 3 Credits**

Includes design, operation, diagnosis, repair and service procedures for transmissions and drive trains used in medium- and heavy-duty applications.

**Special Note:** Students are expected to provide the basic hand tools needed to participate in lab activities. See faculty advisor for tool list.

**Registration Restrictions:** Completion or concurrent enrollment in ADT A156 is strongly recommended.

**Prerequisites:** ADT A102 with a minimum grade of C or concurrent enrollment.

**ADT A295 Automotive Practicum II 3 Credits**

Provides experience in selected industry settings for students nearing the completion of a program in the Automotive and Diesel Technology Department at UAA.

**Special Note:** Most practicum sites will require a valid Alaska driver's license and personally owned tools.

**Registration Restrictions:** A minimum of 24 ADT credits completed, a minimum grade of C or higher for all ADT courses, and advisor approval. Enrollment in this course is restricted to admitted majors in Automotive and Diesel Technology. Instructor approval is required.