

# Auto Service Tech (AST)

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**AST 100. Consumer Mechanics. 2 Credits.**

An awareness course for the passenger car owner-operator. A study of the operation and minor maintenance and repair techniques used in service stations and garages. Also a study of the cost of repair, purchasing, financing, and insuring an automobile.

Course Fees: \$4.30

**AST 102. Intro to Automotive Service. 1 Credit.**

An introductory course designed to assist the novice automotive technician in adjusting to the demands of an automotive service facility. This course will expose the students to the flat rate method of shop pay. Students will also develop a portfolio which showcases the student's technical expertise and human relation skills for obtaining cooperative education and full-time employment. This course meets the human relation component of related instruction for Certificates of Applied Science and Associate of Applied Science degrees. Students will fulfill human relations requirements for the Automotive Certificate of Applied Science and Associate of Applied Science by completing this course.

**AST 106. Auto Manual Drive Train/Axles. 5 Credits.**

This course examines automotive manual power trains. It includes the construction maintenance, diagnosis, and repair of manual transmissions and transaxles, transfer cases, rear axles, drive shafts, and clutches. Driveline angles and Noise, Vibration and Harshness (NVH) will be discussed. Lab application of service procedures is included.

**AST 107. Auto Man Drive Train/Axles Lab. 0 Credits.**

This course examines automotive manual power trains. It includes the construction maintenance, diagnosis, and repair of manual transmissions and transaxles, transfer cases, rear axles, drive shafts, and clutches. Driveline angles and Noise, Vibration and Harshness (NVH) will be discussed. Lab application of service procedures is included.

Course Fees: \$21.50

**AST 114. Automotive Brakes. 5 Credits.**

This course examines automotive braking systems, including hydraulic and friction theory. The construction, maintenance, diagnosis, and repair of disc, drum and antilock braking systems are studied. Use of off-the-car and on-the-car-brake lathes are included in lab. Lab application of service procedures is included.

**AST 115. Automotive Brakes Lab. 0 Credits.**

This course examines automotive braking systems, including hydraulic and friction theory. The construction, maintenance, diagnosis, and repair of disc, drum and antilock braking systems are studied. Use of off-the-car and on-the-car-brake lathes are included in lab. Lab application of service procedures is included.

Course Fees: \$97.50

**AST 160. Automotive Engine Repair. 5 Credits.**

This course is an overview of the design, operation, diagnosis, and service procedures of modern automotive engines. Students participate in the disassembly and the reassembly of engines. Students will participate in the removal and installation of engines in school vehicles. Service and technical engine data are presented to prepare the students for practical experience in engine service and repair.

**AST 161. Automotive Engine Repair Lab. 0 Credits.**

This course is an overview of the design, operation, diagnosis, and service procedures of modern automotive engines. Students participate in the disassembly and the reassembly of engines. Students will participate in the removal and installation of engines in school vehicles. Service and technical engine data are presented to prepare the students for practical experience in engine service and repair.

Course Fees: \$21.50

**AST 164. Auto Diagnosis & Tune Up. 6 Credits.**

This course examines the theory and diagnosis of gasoline engines and related systems. These systems include engine mechanical testing, ignition systems, fuel delivery, emission control systems and an introduction to computerized fuel injection systems. Students will use the latest diagnostic equipment available to test and diagnose these systems during the lab.

**AST 165. Auto Diagnostics & Tune Up Lab. 0 Credits.**

This course examines the theory and diagnosis of gasoline engines and related systems. These systems include engine mechanical testing, ignition systems, fuel delivery, emission control systems and an introduction to computerized fuel injection systems. Students will use the latest diagnostic equipment available to test and diagnose these systems during the lab.

Course Fees: \$21.50

**AST 191. Special Topics. 3 Credits.**

Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

**AST 220. Auto Steering and Suspension. 5 Credits.**

This course examines automotive suspension and steering systems. The theory of operation, construction, maintenance, diagnosis and repair of steering and suspension systems is examined. Alignment procedures, wheel balancing, steering, suspension, headlight aiming, and structural damage diagnosis will be discussed. Lab application of service procedures is included.

**AST 221. Auto Steering & Suspension Lab. 0 Credits.**

This course examines automotive suspension and steering systems. The theory of operation, construction, maintenance, diagnosis and repair of steering and suspension systems is examined. Alignment procedures, wheel balancing, steering, suspension, headlight aiming, and structural damage diagnosis will be discussed. Lab application of service procedures is included.

Course Fees: \$97.00

**AST 266. Computerized Engine Control. 6 Credits.**

This course examines the theory and diagnosis of computerized gasoline fuel injected engines. Students will work with the latest diagnostic equipment to test and repair computerized engine control systems on Toyota, Ford, General Motors and Chrysler vehicles. Prerequisites: AST 160, AST 164, ATDI 134.

Course Fees: \$21.50

**AST 285. ASE Exam Prep: Section One. 1 Credit.**

Students will prepare for ASE tests in Engine Repair (A1), Brakes (A5), Suspension and Steering (A4) and Manual Drive Train and Axles (A3). At the conclusion of this class students will take their ASE certification tests. Prerequisite: AST 106, AST 114, AST 220, AST 160, AST 164.

Course Fees: \$144.00

**AST 286. ASE Exam Prep: Section Two. 1 Credit.**

Students will prepare for ASE tests in Automatic Transmission/Transaxle (A2), Electrical/Electronic Systems (A6), Heating and Air Conditioning (A7) and Engine Performance (A8). At the conclusion of this class students will take their ASE certification tests. Prerequisite: ATDI 134, ATDI 257, ATDI 264, ATDI 265, AST 266.

**AST 298. Cooperative Education. 1-12 Credits.**

A planned and supervised work-learning experience in industry, business, government, or community service agencies related to the University program of study. Prerequisites: two semesters of attendance at Montana State University-Northern, approval of advisor, Dean of the College of Technical Sciences, and cooperative education coordinator. Pass/Fail Only.

**AST 391. Special Topics. 4 Credits.****AST 408. Current Trends Mobility Tech. 2 Credits.**

This course presents an examination of current model year design and trends in the mobility industries. Extensive undergraduate research and the latest techniques for presenting material will be employed.

**AST 450. Advanced Engine Performance. 4 Credits.**

Students in this course will use advanced diagnostic equipment to dynamically test and analyze computer-controlled emission, fuel delivery and ignition systems. Students will follow manufacturer drive cycles to see what effect the alternative fuels, additives and trouble codes have on drivability, emissions and performance. The ASE L1-Advanced Engine Performance Specialist will be heavily emphasized during this course. Prerequisite: AST 266.

Course Fees: \$21.50

**AST 457. Advanced Power Trains. 4 Credits.**

This course examines advanced component operation and diagnosis in automotive power trains. Topics covered in the class are automatic transmissions, automatic transaxles, all-wheel drive systems, CVT (constant variable transmissions), power train electronic control systems and NVH (noise, vibration and harshness) diagnosis. Prerequisites: AST 106 and ATDI 257.

Course Fees: \$21.50

**AST 495. Automotive Practicum. 3 Credits.**

Individualized research practicum selected by the student and an automotive instructor. Survey of literature available, testing and evaluation of project with an oral defense of the resulting paper. Prerequisites: WRIT 101, COMX 111, all required AST courses, and Senior standing.

**AST 498. Cooperative Education. 1-12 Credits.**

A planned and supervised work-learning experience in industry, business, government, or community service agencies related to the University program of study. Prerequisites: two semesters of attendance at Montana State University-Northern, approval of advisor, Dean of the College of Technical Sciences, and cooperative education coordinator. Pass/Fail Only.