

Automotive Curriculum

Degrees:

Credential(s)

AAS: Automotive Technology

Options:

Automotive Technician Option 76

Automotive Parts/Service Writer Option 68

Diploma:

Automotive Technician 67

Automotive Parts/Service Writer 59

Certificate:

Automotive Air Conditioning Mechanic 4
 Automotive Electrician 10

Manual Transmission and Drive Train Technician 5
 Automatic Transmission/Transaxle Technician 5
 Brake Repairer 5
 Engine Repairer 5
 Front End Mechanic 5
 Tune Up Mechanic 25

Description:

Instruction in systems such as engines, fuel, on-board computers, transmissions, steering, suspension, and brakes is the basis for this program.

The Automotive Technician option provides knowledge of the various systems used to develop skills in troubleshooting, performing preventative maintenance, servicing and repairing automobiles. The program, which is designed to be completed in two years, prepares graduates for entry-level service technician jobs in the auto repair industry. The student may be provided a work-study experience alternating between periods of work on-site and work in a classroom-laboratory setting.

The Parts/Service Writer option provides knowledge of the various systems and components and how they relate. This knowledge enables the student to more accurately interpret their customers' automotive complaints, identify and sell automotive parts, and provide efficient customer service within the automotive service and repair industry. The student may take the ASE exams in these areas when they have completed the requirements for these tests.

Implementation: Fall 2004

Competencies:

AAS: Automotive Technology

Upon completion of the program, the graduate can:

General Education Competencies:

1. Communicate effectively using standard written English.

2. Communicate in a clear oral and non-verbal fashion and employ active listening skills.
3. Organize, analyze, and make information useful by employing mathematics
4. Demonstrate basic skills in computer operation and/or software applications.
5. Demonstrate an awareness of one's interaction with the biological/physical environment.
6. Demonstrate an awareness of self as an individual, as a member of a multicultural society, and/or as a member of the world community.
7. Recognize the impact of decisive ideas and events in human heritage.
8. Develop and perform basic search strategies and access information in a variety of formats, print and non-print.
9. Analyze, summarize, and interpret a variety of reading materials.
10. Think critically and make connections in learning across the disciplines.
11. Elaborate upon knowledge to create new thoughts, processes, and or product.
12. Demonstrate an awareness of ethical considerations in making value choices.

Automotive Technician Option:

1. Perform basic automotive maintenance, such as lubrication, battery, cooling system, wheels and tires, spark plugs, wipers, lamps and bulbs, fuses, and other "quick service" items, including vehicle pre-delivery service.
2. Diagnose and repair problems such as unusual tire wear, noise, and vibration related to the suspension and steering systems.
3. Demonstrate basic hydraulic principles and design.
4. Demonstrate the construction and operation of various brake systems.
5. Diagnose and repair both drum and disk brakes, master cylinder, wheel cylinder, vacuum power booster, antilock brakes, and related component parts.
6. Communicate the electronic components of the automobile, including semiconductors, diodes, transistors, and other components.
7. Demonstrate how each component of the automobile interacts with the electronic circuit.
8. Demonstrate computer basics, actuators, and speed control devices in the automobile.
9. Maintain and repair conventional ignition systems, coils, distributors, ignition timing, electronic ignition, and distributorless ignition systems.
10. Demonstrate the principles of refrigeration and the refrigeration cycle.
11. Diagnose and repair automotive heating and air conditioning systems to produce maximum comfort to passengers.
12. Diagnose and repair problems involving power and fuel economy.
13. Diagnose and repair faults in electronic controls and circuitry, including how automotive computers receive, convert, process, compare and use various input data to control appropriate systems and components.
14. Diagnose, repair and adjust the carburetor, fuel injection, and other parts of the automotive fuel system.
15. Communicate the principles of the four-stroke engine.
16. Repair internal combustion engines according to manufacturer's specifications using appropriate equipment, hand tools, and measuring instruments.
17. Demonstrate principles of operation, construction, and service of manual transmissions and related drive train components, differentials, clutches, u-joints, rear-wheel drive, and 4-wheel drive.
18. Repair and reassemble rear-wheel-drive automatic transmissions and front-wheel-drive automatic transaxle, hydraulic principles and power flow.

Automotive Parts/Service Writer Option:

1. Use knowledge of basic hydraulic principles and design to facilitate the automotive service process.
2. Outline operation and identify components and construction of various brake systems.
3. Define and communicate about the electronic components of the automobile, including semiconductors, diodes, transistors, and other components.
4. Identify and explain how each component of the automobile interacts with the electronic circuit.
5. Locate and read schematics for computer basics, actuators, and speed control devices in the

automobile.

6. Use knowledge of the principles of refrigeration and the refrigeration cycle to facilitate the automotive service process.
7. Translate customer communication about automotive problems by using knowledge of the principles of the four-stroke engine.
8. Apply principles of operation, construction, and service of manual transmissions and related drive train components, differentials, clutches, u-joints, rear-wheel drive, and 4-wheel drive to various aspects of automotive parts and service.

Diploma: Automotive Technician

Upon completion of this program, the graduate can:

General Education Competencies:

1. Communicate effectively using standard written English.
2. Communicate in a clear oral and non-verbal fashion and employ active listening skills.
3. Organize, analyze, and make information useful by employing mathematics.

Technical Competencies:

1. Perform basic automotive maintenance, such as lubrication, battery, cooling system, wheels and tires, spark plugs, wipers, lamps and bulbs, fuses, and other “quick service” items, including vehicle pre-delivery service.
2. Diagnose and repair problems such as unusual tire wear, noise, and vibration related to the suspension and steering systems.
3. Demonstrate basic hydraulic principles and design.
4. Demonstrate the construction and operation of various brake systems.
5. Diagnose and repair both drum and disk brakes, master cylinder, wheel cylinder, vacuum power booster, antilock brakes, and related component parts.
6. Demonstrate the electronic components of the automobile, including semiconductors, diodes, transistors, and other components.
7. Demonstrate how each component of the automobile interacts with the electronic circuit.
8. Demonstrate computer basics, actuators, and speed control devices in the automobile.
9. Maintain and repair conventional ignition systems, coils, distributors, ignition timing, electronic ignition, and distributorless ignition systems.
10. Demonstrate the principles of refrigeration and the refrigeration cycle.
11. Diagnose and repair automotive heating and air conditioning systems to produce maximum comfort to passengers.
12. Diagnose and repair problems involving power and fuel economy.
13. Diagnose and repair faults in electronic controls and circuitry, including how automotive computers receive, convert, process, compare and use various input data to control appropriate systems and components.
14. Diagnose, repair and adjust the carburetor, fuel injection, and other parts of the automotive fuel system.
15. Communicate the principles of the four-stroke engine.
16. Repair internal combustion engines according to manufacturer’s specifications using appropriate equipment, hand tools, and measuring instruments.
17. Demonstrate principles of operation, construction, and service of manual transmissions and related drive train components, differentials, clutches, u-joints, rear-wheel drive, and 4-wheel drive.
18. Repair and reassemble rear-wheel-drive automatic transmissions and front-wheel-drive automatic transaxle, hydraulic principles and power flow.

Diploma: Automotive Parts/Service Writer

Upon completion of the program, the graduate can:

General Education Competencies:

1. Communicate effectively using standard written English.
2. Communicate in a clear oral and non-verbal fashion and employ active listening skills.

3. Organize, analyze, and make information useful by employing mathematics.

Technical Competencies:

1. Use knowledge of basic hydraulic principles and design to facilitate the automotive service process.
2. Outline operation and identify components and construction of various brake systems.
3. Define and communicate about the electronic components of the automobile, including semiconductors, diodes, transistors, and other components.
4. Identify and explain how each component of the automobile interacts with the electronic circuit.
5. Locate and read schematics for computer basics, actuators, and speed control devices in the automobile.
6. Use knowledge of the principles of refrigeration and the refrigeration cycle to facilitate the automotive service process.
7. Translate customer communication about automotive problems by using knowledge of the principles of the four-stroke engine.
8. Apply principles of operation, construction, and service of manual transmissions and related drive train components, differentials, clutches, u-joints, rear-wheel drive, and 4-wheel drive to various aspects of automotive parts and service.

Certificate: Automotive Air Conditioning Mechanic

Upon completion of the credential, the graduate can:

1. Demonstrate the principles of refrigeration and the refrigeration cycle.
2. Diagnose and repair automotive heating and air conditioning systems to produce maximum comfort to passengers.

Certificate: Automotive Electrician

Upon completion of the credential, the graduation can:

1. Explain the electronic components of the automobile, including semiconductors, diodes, transistors, and other components.
2. Demonstrate how each component of the automobile interacts with the electronic circuit.
3. Demonstrate computer basics, actuators, and speed control devices in the automobile.

Certificate: Manual Transmission and Drive Train Technician

Upon completion of the credential, the graduate can:

1. Demonstrate principles of operation, construction, and service of manual transmissions and related drive train components, differentials, clutches, u-joints, rear-wheel drive, and 4-wheel drive.

Certificate: Automatic Transmission /Transaxle Technician

Upon completion of the credential, the graduate can:

1. Repair and reassemble both rear-wheel-drive automatic transmissions and front-wheel-drive automatic transaxle, hydraulic principles and power flow.

Certificate: Brake Repairer

Upon completion of the credential, the graduate can:

1. Demonstrate basic hydraulic principles and design.
2. Demonstrate the construction and operation of various brake systems.
3. Diagnose and repair both drum and disk brakes, master cylinder, wheel cylinder, vacuum power booster, antilock brakes, and related component parts.

Certificate: Engine Repairer

Upon completion of the credential, the graduate can:

1. Communicate the principles of the four-stroke engine.
2. Repair internal combustion engines according to manufacturer's specifications using appropriate equipment, hand tools, and measuring instruments.

Certificate: Front End Mechanic

Upon completion of the credential, the graduate can:

1. Diagnose and repair problems such as unusual tire wear, noise, and vibration related to the suspension and steering systems.

Certificate: Tune Up Mechanic

Upon completion of the credential, the graduate can:

1. Explain the electronic components of the automobile, including semiconductors, diodes, transistors, and other components.
2. Demonstrate how each component of the automobile interacts with the electronic circuit.
3. Demonstrate computer basics, actuators, and speed control devices in the automobile.
4. Maintain and repair conventional ignition systems, coils, distributors, ignition timing, electronic ignition, and distributorless ignition systems.
5. Diagnose and repair problems involving power and fuel economy.
6. Diagnose and repair faults in electronic controls and circuitry, including how automotive computers receive, convert, process, compare and use various input data to control appropriate systems and components.
7. Diagnose, repair and adjust the carburetor, fuel injection, and other parts of the automotive fuel system.

Outlines:

AAS: Automotive Technology
(Offered at BGT, BSC, ELC, HZC, JFC)

General Education:

Mathematics	3 credits
Science	3 credits
Social Interaction	3 credits
Heritage/Humanities	3 credits
Writing/Accessing Information	3 credits
Oral Communication	3 credits
General Education Total Credit Hours:	18 credits

Technical Core:

ADX 120	Basic Automotive Electricity OR	3 credits
BEX 100	Basic Electricity for Non-Majors	(3credits)
ADX 150	Engine Repair	3 credits
ADX 170	Climate Control	3 credits
ADX 260	Electrical Systems	3 credits
AUT 110	Brake Systems	3 credits
AUT 130	Manual Transmissions	3 credits
AUT 140	Basic Fuel and Ignition Systems	3 credits
AUT 142	Emission Systems	3 credits
AUT 160	Suspension and Steering	3 credits
AUT 180	Automatic Transmission/Transaxle	3 credits
COE 199	Cooperative Education OR	1 credit
AUT 198	Practicum	(1credit)
AUT 240	Computer Control Systems and Diagnosis	3 credits
CPU 150	Computer Fundamentals OR	3 credits
CIS 100	Introduction to Computers	(3 credits)
	Technical Core Total Credit Hours:	37 credits

Automotive Technician Option:
(Offered at BGT, BSC, ELC, HZC, JFC)

ADX	121	Basic Automotive Electricity Lab OR	2 credits
BEX	101	Basic Electricity Lab for Non-Majors	(2 credits)
ADX	151	Engine Repair Lab	2 credits
ADX	171	Climate Control Lab	1 credit
ADX	261	Electrical Systems Lab	2 credits
AUT	111	Brake Systems Lab	2 credits
AUT	131	Manual Transmissions Lab	2 credits
AUT	141	Basic Fuel and Ignition Systems Lab	2 credits
AUT	143	Emission Systems Lab	2 credits
AUT	161	Suspension and Steering Lab	2 credits
AUT	181	Automatic Transmission/Transaxle Lab	2 credits
AUT	241	Computer Control Systems and Diagnosis Lab	2 credits
Subtotal Credits:			21 credits
Total Credits:			76 credits

Automotive Parts/Service Writer Option:

ISX	100	Industrial Safety	3 credits
TQX	110	Total Quality Management	3 credits
B&E	100	Introduction to Business and Economics	1 credits
ACT	101	Fundamentals of Accounting I	3 credits
TEC	100	Communication for Business and Industry OR	3 credits
CMS	152	Writing for Business and Industry	(3 credits)
Subtotal Credits:			13 credits
Total Credits:			68 credits

Diploma Automotive Technician

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HAZ, JFC, MYC, OWC, SEC, SMC)

General Education:

		Mathematics	3 credits
		Science	3 credits
		Writing/Accessing Information	3 credits
		OR	
WPP	200	Workplace Principles*	(3) credits
TEC	200	Technical Communications*	(3) credits
General Education Total Credit Hours			9 credits

* The following courses may be used for six of the nine credits if a diploma is sought. The following courses will not count toward the AAS degree.

Technical Core:

ADX	120	Basic Automotive Electricity AND	3 credits
ADX	121	Basic Automotive Electricity Lab OR	2 credits
BEX	100	Basic Electricity for Non-Majors AND	(3credits)
BEX	101	Basic Electricity Lab for Non-Majors	(2 credits)
ADX	150	Engine Repair	3 credits
ADX	151	Engine Repair Lab	2 credits
ADX	170	Climate Control	3 credits
ADX	171	Climate Control Lab	1 credit
ADX	260	Electrical Systems	3 credits
ADX	261	Electrical Systems Lab	2 credits
AUT	110	Brake Systems	3 credits
AUT	111	Brake Systems Lab	2 credits
AUT	130	Manual Transmissions	3 credits

AUT	131	Manual Transmissions Lab	2 credits
AUT	140	Basic Fuel and Ignition Systems	3 credits
AUT	141	Basic Fuel and Ignition Systems Lab	2 credits
AUT	142	Emission Systems	3 credits
AUT	143	Emission Systems Lab	2 credits
AUT	160	Suspension and Steering	3 credits
AUT	161	Suspension and Steering Lab	2 credits
AUT	180	Automatic Transmission/Transaxle	3 credits
AUT	181	Automatic Transmission/Transaxle Lab	2 credits
COE	199	Cooperative Education OR	1 credit
AUT	198	Practicum	(1credit)
AUT	240	Computer Control Systems and Diagnosis	3 credits
AUT	241	Computer Control Systems and Diagnosis	2 credits
CPU	150	Computer Fundamentals OR	3 credits
CIS	100	Introduction to Computers	(3 credits)
		Subtotal Credits:	58 credits
		Total Credits:	67 credits

Automotive Parts/Service Writer

General Education:

		Mathematics	3 credits
		Science	3 credits
		Writing/Accessing Information	3 credits
		OR	
WPP	200	Workplace Principles*	(3 credits)
TEC	200	Technical Communications*	(3 credits)
		General Education Total Credit Hours	9 credits

* The following courses may be used for six of the nine credits of general education if a diploma is sought. The following courses will not count toward the AAS degree.

Technical or Support Courses:

ADX	120	Basic Automotive Electricity OR	3 credits
BEX	100	Basic Electricity for Non-Majors	(3credits)
ADX	150	Engine Repair	3 credits
ADX	170	Climate Control	3 credits
ADX	260	Electrical Systems	3 credits
AUT	110	Brake Systems	3 credits
AUT	130	Manual Transmissions	3 credits
AUT	140	Basic Fuel and Ignition Systems	3 credits
AUT	142	Emission Systems	3 credits
AUT	160	Suspension and Steering	3 credits
AUT	180	Automatic Transmission/Transaxle	3 credits
COE	199	Cooperative Education OR	1 credit
AUT	198	Practicum	(1 credit)
AUT	240	Computer Control Systems and Diagnosis	3 credits
CPU	150	Computer Fundamentals OR	3 credits
CIS	100	Introduction to Computers	(3 credits)
ISX	100	Industrial Safety	3 credits
TQX	110	Total Quality Management	3 credits
B&E	100	Introduction to Business and Economics	1 credit
TEC	100	Communication for Business and Industry OR	3 credits
CMS	152	Writing for Business and Industry	(3 credits)
ACT	101	Fundamentals of Accounting I	3 credits
		Technical or Support Courses Total Credit Hours:	50 credits

Total Credits:

59 credits

Certificate

Automotive Air Conditioning Mechanic

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HZC, JFC, MDC, MYC, OWC, SEC, SMC)

ADX	170	Climate Control	3 credits
ADX	171	Climate Control Lab	1 credit
		Total Credits	4 credits

Automotive Electrician

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HZC, JFC, MDC, MYC, OWC, SEC, SMC)

ADX	120	Basic Automotive Electricity AND	3 credits
ADX	121	Basic Automotive Electricity Lab OR	2 credits
BEX	100	Basic Electricity for Non-Majors AND	(3 credits)
BEX	101	Basic Electricity Lab for Non-Majors	(2 credits)
ADX	260	Electrical Systems	3 credits
ADX	261	Electrical Systems Lab	2 credits
		Total Credits	10 credits

Manual Transmission/Drive Train Technician

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HZC, JFC, MYC, OWC, SEC, SMC)

AUT	130	Manual Transmissions	3 credits
AUT	131	Manual Transmissions Lab	2 credits
		Total Credits	5 credits

Automatic Transmission/Transaxle Technician

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HZC, JFC, MYC, OWC, SEC, SMC)

AUT	180	Automatic Transmission/Transaxle	3 credits
AUT	181	Automatic Transmission/Transaxle Lab	2 credits
		Total Credits	5 credits

Brake Repairer

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HZC, JFC, MYC, OWC, SEC, SMC)

AUT	110	Brake Systems	3 credits
AUT	111	Brake Systems Lab	2 credits
		Total Credits	5 credits

Engine Repairer

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HZC, JFC, MYC, OWC, SEC, SMC)

AUT	150	Engine Repair	3 credits
AUT	151	Engine Repairer	2 credits
		Total Credits	5 credits

Front End Mechanic

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HZC, JFC, MYC, OWC, SEC, SMC)

AUT	160	Suspension and Steering	3 credits
AUT	161	Suspension and Steering Lab	2 credits
		Total Credits	5 credits

Tune-up Mechanic

(Offered at ASC, BGT, BSC, CKT, ELC, GTW, HZC, JFC, MYC, OWC, SEC, SMC)

ADX	120	Basic Automotive Electricity	3 credits
ADX	121	Basic Automotive Electricity Lab	2 credits
ADX	260	Electrical Systems	3 credits
ADX	261	Electrical Systems Lab	2 credits
AUT	140	Basic Fuel and Ignition Systems	3 credits
AUT	141	Basic Fuel and Ignition Systems Lab	2 credits
AUT	142	Emissions Systems	3 credits
AUT	143	Emissions Systems Lab	2 credits
AUT	240	Computer Control Systems and Diagnosis	3 credits
AUT	241	Computer Control Systems and Diagnosis Lab	2 credits
		Total Credits	25 credits

Dates of Actions:

Approved:

Revised: December 2003, May 2004