

## Automotive Curriculum

### Degrees:

#### Credential(s)

<b>AAS:</b>	Automotive Technology	
<b>Tracks:</b>	Automotive Technician Track	69-72
	Automotive Parts/Service Writer Track	61-64
<b>Diploma:</b>	Automotive Technician	61-64
	Automotive Parts/Service Writer	53-56
<b>Certificate:</b>	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 track 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 track 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 2011

### Competencies:

#### AAS: Automotive Technology

Upon completion of the program, the graduate can:

Upon completion of the **General Education Competencies:**

Students should prepare for twenty-first century challenges by gaining:

- A. Knowledge of human cultures and the physical and natural worlds through study in the sciences and mathematics, social sciences, humanities, languages, and the arts.
- B. Intellectual and practical skills, including
  - Inquiry and analysis
  - Critical and creative thinking
  - Written and oral communication
  - Quantitative literacy
  - Information literacy
  - Teamwork and problem solving
- C. Personal and social responsibility, including
  - Civic knowledge and engagement (local and global)
  - Intercultural knowledge and competence

- Ethical reasoning and action
  - Foundations and skills for lifelong learning
- D. Integrative and applied learning, including synthesis and advanced accomplishment across general and specialized skills.

**Automotive Technician Track:**

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 Track:**

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:

**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:

**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**

General Education Titles and Requirements Updated October 2011

**General Education:**

Quantitative Reasoning	3 credits
Natural Sciences	3 credits
Social/Behavioral Sciences	3 credits
Heritage/ Humanities	3 credits
Written Communication	3 credits
<b>General Education Total Credit Hours:</b>	<b>15 credits</b>

**Technical Core:**

	Computer /Digital Literacy course OR demonstrated competency	0-3 credits
ADX 120	Basic Automotive Electricity	3 credits
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
AUT 240	Computer Control Systems and Diagnosis	3 credits

**Total Technical core credits 33-36 credits**

**Automotive Technician Track:**

ADX 121	Basic Automotive Electricity Lab	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
	<b>Subtotal Credits:</b>	<b>21 credits</b>
	<b>Total Credits:</b>	<b>69-72 credits</b>

**Automotive Parts/Service Writer Track:**

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)
	<b>Subtotal Credits:</b>	<b>13 credits</b>
	<b>Total Credits:</b>	<b>61-64 credits</b>

**Diploma: Automotive Technician**

**General Education:**

Area 1= Written Communication, Oral Communications, or Humanities/Heritage .....3

General Education Titles and Requirements Updated October 2011

Area 2= Social/Behavior al Sciences, Natural Sciences or Quantitative Reasoning.....3  
**General Education Total Credit Hours** **6 credits**

**Technical Core:**

		Computer /Digital Literacy course Or demonstrated competency	0-3 credits
ADX	120	Basic Automotive Electricity	3 credits
ADX	121	Basic Automotive Electricity Lab	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
AUT	240	Computer Control Systems and Diagnosis	3 credits
AUT	241	Computer Control Systems and Diagnosis	2 credits
		Any approved work experience component	1 credit
		<b>Subtotal Credits:</b>	<b>55-58 credits</b>
		<b>Total Credits:</b>	<b>61-64 credits</b>

**Diploma: Automotive Parts/Service Writer**

**General Education:**

Area 1= Written Communication, Oral Communications, or Humanities/Heritage .....3  
 Area 2= Social/Behavior al Sciences, Natural Sciences or Quantitative Reasoning.....3  
**General Education Total Credit Hours** **6 credits**

**Technical or Support Courses:**

		Computer /Digital Literacy course Or demonstrated competency	0-3 credits
ADX	120	Basic Automotive Electricity	3 credits
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
AUT	240	Computer Control Systems and Diagnosis	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

General Education Titles and Requirements Updated October 2011

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
		Any approved work experience component	1 credit

**Technical or Support Courses Total Credit Hours: 47-50 credits**  
**Total Credits: 53-56 credits**

**Certificate: Automotive Air Conditioning Mechanic**

ADX	170	Climate Control	3 credits
ADX	171	Climate Control Lab	1 credit
		<b>Total Credits</b>	<b>4 credits</b>

**Certificate: Automotive Electrician**

ADX	120	Basic Automotive Electricity AND	3 credits
ADX	121	Basic Automotive Electricity Lab	2 credits
ADX	260	Electrical Systems	3 credits
ADX	261	Electrical Systems Lab	2 credits
		<b>Total Credits</b>	<b>10 credits</b>

**Certificate: Manual Transmission/Drive Train Technician**

AUT	130	Manual Transmissions	3 credits
AUT	131	Manual Transmissions Lab	2 credits
		<b>Total Credits</b>	<b>5 credits</b>

**Certificate: Automatic Transmission/Transaxle Technician**

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

**Certificate: Brake Repairer**

AUT	110	Brake Systems	3 credits
AUT	111	Brake Systems Lab	2 credits
		<b>Total Credits</b>	<b>5 credits</b>

**Certificate: Engine Repairer**

ADX	150	Engine Repair	3 credits
ADX	151	Engine Repairer	2 credits
		<b>Total Credits</b>	<b>5 credits</b>

**Certificate: Front End Mechanic**

AUT	160	Suspension and Steering	3 credits
AUT	161	Suspension and Steering Lab	2 credits
		<b>Total Credits</b>	<b>5 credits</b>

**Certificate: Tune-up Mechanic**

ADX	120	Basic Automotive Electricity	3 credits
ADX	121	Basic Automotive Electricity Lab	2 credits
ADX	260	Electrical Systems	3 credits

General Education Titles and Requirements Updated October 2011

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
		<b>Total Credits</b>	<b>25 credits</b>

**Dates of Actions:**

**Approved:**

**Revised:** December 2003, May 2004, April 2011