

AUTOMOTIVE TECHNOLOGY

Associate of Applied Science Degree Program Description

Department of Transportation Technologies

Scott Community College

Bettendorf, IA 52722

(563) 441-4202

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Department Coordinator

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Program Description

Since the inception of Scott Community College, Auto Technology has been one of the college's most successful programs. The Automotive Technology Program is a two-year program admitting students in the Fall and Spring semester every year.

The automotive industry is the single largest employer in the United States. Our program is recognized by employers in Iowa and Illinois for its quality, and it is ASE certified. That means it has received a guarantee from the National Institute for Automotive Service Excellence that it meets the highest industry standards.

In just two years, you'll have your Associate of Applied Science Degree, plus the skills you need to solve the challenge of today's high-tech systems.

Program Accreditation

In 1988 the Automotive Technology Program became the first program in Iowa to gain certification in Automotive Service Excellence (ASE). In 1991, 1995 the Automotive Technology Program received the award for Best in Iowa from the American Vocational Association. Graduates from our program are prepared to pass certification exams in all of the following eight areas:

Engine Repair

Manual Drive Train & Axles

Brakes

Heating & Air Conditioning

Automotive Transmission/Transaxle

Suspension & Steering

Electrical/Electronics Systems

Engine Performance

Full-Time vs. Part-Time Students

The Automotive Technology Program is designed for full-time students interested in a career in diagnosing and repairing automobiles. Students interested in enrolling in specific disciplines or courses on a part-time basis may be admitted by the department coordinator. Classes in Automotive Technology are taught by lecture and followed by appropriate laboratory experience.

Description of the Profession

An Automotive Technician of today must be a versatile person willing to deal with customers as well as repair automobiles. Today's technicians work with computers and other sophisticated diagnostic equipment

Some of the graduates of this program will work in shops as general line technicians performing work on all systems of the vehicle. Others Will work in specialty shops that specialize in just certain areas of the vehicle such as brakes or transmissions.

Graduates may also work in related areas such as service advising or parts distribution.

Typical Duties

- Diagnose & repair driveability problems
- Troubleshoot and repair electrical problems
- Prepare repair estimates
- Perform basic automobile service
- Perform computerized four wheel alignments
- Diagnose & repair transmission and drive trains
- Service & repair heating and air conditioning systems
- Perform brake service
- Advise customers
- Attend classes & seminars to stay current in the Field
- Maintain equipment used in shops

Performance Standards

The Automotive Technician must have sufficient strength, motor coordination and manual dexterity to:

- Lift and move the various components of an automobile.
- Move toolboxes, floor jacks and other portable devices freely about the shop area.

The Automotive Technician must be capable of:

- Reading and interpreting various shop manuals and technical bulletins associated with the automobile.
- Reading and interpreting as well as writing repair orders.
- Communicating verbally with customers, parts personnel and management.
- Interpreting electrical wiring schematics and diagrams.

The Automobile Technician must have the mental and intellectual capacity to:

- Logically solve mechanical problems.
- Absorb and understand the new technology as it evolves.
- Interpret electronic meters including oscilloscopes.

Employment Opportunities

Graduates are employed by automobile dealerships, independent garages, fleet garages and chain stores, as well as city, county, state and federal agencies. Entry-level technicians can expect to earn between \$16,000 and \$25,000 annually. Experienced technicians earn considerably more.

Job Outlook

The current job market for Automotive Technology remains very good. In the last five years there were more job opportunities than there were graduates to fill them. On a national employment level this field remains very good and stable. In 2004 automotive technicians held about 803,000 jobs. The number of jobs is expected to increase 10 to 15 percent through the year 2014.

Program Faculty

The Automotive Technology Program along with the Diesel Technology Program at Scott Community College employs five instructors.

Alan Shaw, B.A., Master ASE Automotive Technician Certified

Darrell Hanan, A.A.S., B.T., Master ASE Automotive Technician & Advanced Level Engine Performance Certified

John Wingert, A.A.S., Master ASE Heavy-Duty Truck, Master ASE Automotive Technician Certified

How to Enroll

A candidate for admission to the Auto Technology Program must:

- Submit the Scott Community College admission application in person or by mail.
- Send all High School and College transcripts or GED scores to:
Student Services, Scott Community College,
500 Belmont Road,
Bettendorf, IA 52722
- Complete the college assessment by making an appointment with the Testing Center, 441-4088.

Estimated Program Costs

Approximate costs for the entire program are:

In-State Tuition & Fees:	\$7280.00 (Fall 2009)
Out-of-State Tuition & Fees:	\$10,920.00 (Fall 2009)
Books and Supplies:	\$800.00
Tools:	\$2,500.00**

***Tuition does not include the cost of developmental course-work (if necessary.)**

****Tools from the following list will cost from \$1,500 to \$2,500 depending on the vendor you choose. Toolboxes also vary in price from \$700 to \$1,400.**

Tools

Students are responsible for having their own tools. The minimum tools needed for completion of this program are listed below.

AUTO MECHANICS TOOL LIST

<u>1/4" drive socket set</u>	-- Line wrenches 8mm to 17mm
Box, ratchet, 3" extension, 6" extension	1 Fender cover
Breaker handle	-- 12 volt electric test light
Sockets 4-15mm - 6 point sockets	-- electrical wire pliers
<u>3/8" drive socket set</u>	-- heavy duty diagonal side cutter 6" length
Box, ratchet, 1" extension, 2-4", 6-10" extension	-- Tire inflater
breaker handle bar	-- inspection mirror
Metric universal flex socket set, 10mm-19mm	-- Safety glasses
Metric - 10-23 MM 3/8 drive sockets	-- Leather shoes
<u>Deep Well Sockets</u> 3/8 drive Metric -10-19mm	-- 1 tool box (minimum 3 drawer rolling type cabinet)
5/16" 8 pt. Socket 3/8" Drive	
3/8 drive torx bit set 27, 30, 40, 45, 50, 55	-- true-arc internal & external (conventional)
1 Torque Wrench 3/8" drive, 30 to 200 inch pounds	<u>Combination Wrench Set</u>
Scratch awl (ice pick)	5/16, 11/32, 1/4, 3/8, 7/16, 1/2, 9/16, 5/8,
Air Nozzle with rubber tip	Metric - combination 7-19 MM

1/2" drive socket set

Box, ratchet, extension 3", 6" 10" (approx.)
breaker bar handle, 1 universal flex extension,
sockets 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4,
7/8, 13/16, 15/16, 1, 1 1/16, 1 1/4
Adapters 1/2 to 3/8, 3/8 and 1/2 drive; 3/8 to 1/4
-- 2 ball peen hammers 1-16 oz., 1-24 oz.
-- 1 Pocket screw driver
-- pocket telescoping magnet
-- screwdriver set 3 Phillips, 4 standard
-- 1 punch set-5 piece-1/8, 5/16, 3/8, 7/16, 1/2
-- spark plug gauge set (wire type) .035 to .080
-- feeler gauge-flat type ignition and valve 45°
-- 1 battery post cleaner
-- 1 thermometer pocket type
-- magnetic tool with handle
Dial Indicator - measure in .001" increments
clamp-on-base
-- 1 pr. slip point pliers approx. 6" length
-- 1 cold chisel set - 5 piece-5/16, 7/16, 1/2, 5/8,
11/16
-- snap ring pliers
-- 1 pr. vice grip pliers 7" length (approx.)
-- 1 pr. interlocking pliers 8" to 9" length
-- 14 piece metric hex wrench set 2mm to 19 mm
-- torx screwdriver set T15-T30

REV 6/07

-- 1 pocket ruler 6" both metric & inches

1 Hand held digital multimeter w/following:

Minimum Required Features:

D.C. volts 0.5% accuracy or better

A.C. volts

D.C. current 0-10 amps or 0-20A

Resistance Diode Check

Frequency 0-50Khz

Duty Cycle

Optional Features:

Temperature

RPM

Dwell

Max-min-average

Data Hold

Analog Bar Graph

Pulse Width (MS)

-- leather gloves for welding, goggles #5 lens &
tip

Angled Pick

-- micrometer torque wrench, 1/2" drive with
ratchet (10 to 150 ft. lb. range)

Files: 12" round, 12"flat

-- 1 pr. needle nose pliers, with cutter to 6" length

--1-6"electronic digital readout caliper
metric/inch conversion

-- wire brush

-- 1 gasket scraper (putty knife)

tire pressure gauge 15-60 lbs.

Uniforms

Uniforms are not required but each student must have safety glasses and leather work shoes. Sneakers and shorts are not allowed in laboratory areas.

Financial Aid/Scholarships

Many types of Financial Aid are available for Auto Technology students. If you need financial assistance please make an appointment with the Financial Aid Office. Financial aid forms for fall semester are due to the financial aid office April 1st.

Student Organizations

Students are eligible for membership in the Auto Tech Club. The club has several worthwhile activities each year including field trips, fundraisers, and the annual car show. The highlight of the year is the SkillsUSA competition. Local winners compete in the state competition with the state winners moving on to compete in the national competition. In 1994, our club placed first and third in the state competition and 10th in the national competition. In 1998, our club placed third in the state competition. In 1999, our club placed second in the state competition.

Articulation

The Scott Community College Auto Tech program does not have articulation agreements with any local high schools at this time.

Program/Course Descriptions

Automotive Technology

Scott Community College (Diploma, AAS)

Automotive Technology Program Course Sequence; Fall Start

REV 9-09

	Course Title	Cr. Hours
First Semester - Fall		
AUT 115	Automotive Shop Safety	1
AUT 606	Basic Automotive Electricity/Electronics	3
AUT 614	Automotive Electrical I	3
AUT 164	Automotive Engine Repair	4
COM 102	Communication Skills OR	3
ENG 105	Composition I	
MAT 104	Applied Math Topics OR	3
MAT 110	Math for Liberal Arts	
	Semester Total	17

Second Semester - Spring

AUT	802	Engine Performance I	3
AUT	232	Automotive Transmissions I	3
AUT	304	Automotive Manual Drive Train and Axles	4
AUT	524	Automotive Brake Systems and Service	4
Semester Total			14

Summer Session

AUT	704	Automotive Heating and Air Conditioning	4
AUT	404	Automotive Suspension and Steering	4
Session Total			8
Diploma Awarded			39

Third Semester - Fall

AUT	811	Engine Performance II	4
AUT	233	Automotive Transmissions II	3
BCA	188	Business Computer Apps OR	3
BUS	102	Intro to Business	
PSY	213	Industrial & Organizational Psychology OR	3
HUM	105	Working in America	
Semester Total			13

Fourth Semester - Spring

AUT	656	Automotive Electrical II	4
AUT	817	Automotive Engine Performance III	3
WEL	331	Welding Fundamentals	2
AUT	911	Cooperative/Internship	4
Semester Total			13

Associate in Applied Science Awarded 65

Automotive Technology Program Course Sequence; Spring Start

Course Title			Cr. Hours
First Semester - Spring			
AUT	115	Automotive Shop Safety	1
AUT	606	Basic Automotive Electricity/Electronics	3
AUT	614	Automotive Electrical I	3
AUT	802	Engine Performance I	3
AUT	232	Automotive Transmissions I	3
Semester Total			13
Summer Session 1			
AUT	811	Engine Performance II	4
AUT	817	Automotive Engine Performance III	3
Session Total			7

Second Semester - Fall

AUT	164	Automotive Engine Repair	4
COM	102	Communication Skills OR	3
ENG	105	Composition I	
MAT	104	Applied Math Topics OR	3
MAT	110	Math for Liberal Arts	
AUT	233	Automotive Transmissions II	3
Semester Total			13

Third Semester - Spring

AUT	656	Automotive Electrical II	4
AUT	304	Automotive Manual Drive Train and Axles	4
AUT	524	Automotive Brake Systems and Service	4
Semester Total			12

Summer Session 2

AUT	704	Automotive Heating and Air Conditioning	4
AUT	404	Automotive Suspension and Steering	4
Session Total			8

Fourth Semester - Fall

WEL	331	Welding Fundamentals	2
AUT	911	Cooperative/Internship	4
BCA	188	Business Computer Apps OR	3
BUS	102	Intro to Business	
PSY	213	Industrial & Organizational Psychology OR	3
HUM	105	Working in America	
Semester Total			12

Associate in Applied Science Awarded 65

Automotive Technology Basic Service Certificate**Fall Start Course Sequence**

		Course Title	Cr. Hours
First Semester - Fall			
AUT	116	Automotive Shop Safety	1
AUT	606	Basic Automotive Electricity/Electronics	3
AUT	614	Automotive Electrical I	3
COM	102	Communication Skills OR	3
ENG	105	Composition I	

Second Semester - Spring

AUT	524	Automotive Brake Systems and Service	4
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Summer Session

AUT	404	Automotive Suspension and Steering	4
Total Credit hours			18

Automotive Technology Basic Service Certificate

Spring Start Course Sequence

			Cr. Hours
Course Title			
First Semester - Spring			
AUT	116	Automotive Shop Safety	1
AUT	606	Basic Automotive Electricity/Electronics	3
AUT	614	Automotive Electrical I	3
AUT	524	Automotive Brake Systems and Service	4
BCA	188	Business Computer Apps OR	3
BUS	102	Intro to Business	

Summer Session

AUT	404	Automotive Suspension and Steering	4
Total Credit hours			18

Automotive Technology General Service Certificate

Course Sequence - must start in fall to complete in one academic year.

			Cr. Hours
Course Title			
First Semester - Fall			
AUT	116	Automotive Shop Safety	1
AUT	606	Basic Automotive Electricity/Electronics	3
AUT	614	Automotive Electrical I	3
AUT	164	Automotive Engine Repair	4
COM	102	Communication Skills OR	3
ENG	105	Composition I	

Second Semester - Spring

AUT	802	Engine Performance I	3
AUT	232	Automotive Transmissions I	3
AUT	304	Automotive Manual Drive Train and Axles	4
AUT	524	Automotive Brake Systems and Service	4

Summer Session

AUT	704	Automotive Heating and Air Conditioning	4
AUT	404	Automotive Suspension and Steering	4
Total Credit hours			36

Auto Technology Courses

MAT104 Applied Math Topics 3 cr.

Presents algebra and geometry applied to specific trade applications. Mathematical ideas and procedures will be presented first, followed by applications within the various trades.

(59.4 Lec. Hrs.)

Prerequisite: Placement by college assessment test.

AUT606 Basic Automotive Electricity/Electronics 3 cr.

In this course, the student is introduced to basic electrical and electronics principles. The basics are applied to automotive electrical circuits. What electricity is and how it does its work is covered in detail. Lab sessions are spent turning theory into hands-on practice with meters and basic circuits.

(39.6 Lec. Hrs./59.4 Lab Hrs.)

AUT614 Automotive Electrical I 3 cr.

In this course the student is introduced to basic automotive battery, charging and starting systems. The operating principles will be discussed during the lecture/discussion sessions. Lab sessions are spent practicing testing, diagnosis and repair.

(39.6 Lec. Hrs./59.4 Lab Hrs.)

Prerequisite or Co-requisite: AUT116 and AUT606

AUT116 Automotive Shop Safety 1 cr.

This course is designed to acquaint the student with the proper personnel and shop safety procedures needed to function in an automotive shop. Tool identification, tool care and maintenance will be covered. Policy, procedures and orientation will also be included in this course.

(19.8 Lec. Hrs.)

AUT164 Automotive Engine Repair 4 cr.

Basic theory of two-cycle and four-cycle gasoline engines and their application will be introduced. Disassembly, inspection and reassembly competencies will be experienced as well as cooling, lubrication, induction, exhaust, compression and valve systems. Students will develop competencies in precision measuring and services procedures.

(39.6 Lec. Hrs./118.8 Lab Hrs.)

Co-requisite: AUT116

AUT524 Automotive Brake Systems and Service 4 cr.

This course deals specifically with disc and drum brakes, power and conventional braking systems and emergency braking systems. Students will develop competencies aimed at entry-level skills as a brake specialist.

(49.5 Lec. Hrs./89.1 Lab Hrs.)

Prerequisite or Co-requisite: AUT116

AUT304 Automotive Manual Drive Train and Axles 4 cr.

Provides basic knowledge in automotive clutches, standard transmissions, transaxles and differentials. Basic theory, diagnosis and service procedures are covered. Students will be able to correctly disassemble and reassemble standard transmissions, transaxles and differentials in accordance with manufacturers' guidelines.

(49.5 Lec. Hrs./89.1 Lab Hrs.)

Prerequisite or Co-requisite: AUT116

AUT802 Engine Performance I 3 cr.

This course is designed to train the student in engine mechanical testing and ignition system theory and testing. Basic ignition system theory, operation and diagnosis will be covered. Electronic (EI) and distributor (DI) ignition systems will be discussed. Lab time will be used to learn the use of diagnostic equipment in troubleshooting and repair of engine mechanical and ignition systems as they relate to driveability issues.

(39.6 Lec. Hrs./ 59.4Lab Hrs.)

Prerequisite or Co-requisite: AUT606 and AUT116

AUT232 Automotive Transmission I 3 cr.

This course is designed to provide basic knowledge in the diagnosis and repair of the automatic transmission. The student will develop skills necessary to perform in-car automatic transmission service. The student will also develop an understanding of the operation and service of torque converters, planetary gear trains and hydraulic components used in automatic transmissions. In-car service, as well as, removal-installation and overhaul procedures will be stressed in the lab portion of this course.

(39.6 Lec. Hrs./ 59.4Lab Hrs.)

Prerequisite or Co-requisite: AUT116

AUT404 Automotive Suspension and Steering 4 cr.

This course deals specifically with automobile suspension and steering systems. Specific skills needed for the development of competencies will be taught. Competencies that are developed in this course are aimed at entry-level skills as a suspension and steering specialist.

(49.5 Lec. Hrs./89.1 Lab Hrs.)

Prerequisite or Co-requisite: none

AUT704 Automotive Heating and Air Conditioning 4 cr.

Provides basic knowledge in automotive heating and air conditioning. Basic theory, system diagnosis and service procedures are covered. Students are able to troubleshoot, purge, evacuate, charge and performance test an automobile or truck air conditioning system after completing this course.

(59.4 Lec. Hrs./59.4 Lab Hrs.)

Prerequisite or Co-requisite: none

AUT656 Automotive Electrical II 4 cr.

This course deals specifically with the automobile chassis electrical systems. The student will be taught how automobile circuits are wired and how they operate. Troubleshooting and repair of the systems will be stressed. Upon completion, the student should be able to demonstrate an understanding of the operation and design of the following types of chassis electrical systems: lighting systems, horn, wiper/washer, cooling fan, instruments and warning devices, speed control, anti-lock brake and traction control, HVAC, heated windows and mirrors, power accessories, and passive restraint systems.

(59.4 Lec. Hrs./59.4 Lab Hrs.)

Prerequisites or Co-requisites: AUT606 and AUT116

AUT811 Engine Performance II 4 cr.

This course is designed to give students an understanding of electronic fuel injection and the use of computer controls in today's automobiles. The course will present Electronic Fuel Injection theory and component operation as well as automotive computer operation, sensor inputs and actuator outputs. Diagnosis and testing of these systems will be discussed and practiced. Similarities and differences of various Original Equipment Manufacturer systems will be discussed.

(59.4 Lec. Hrs./59.4 Lab Hrs.)

Prerequisites: AUT606 and AUT802

AUT233 Automotive Transmission II 3 cr.

This course is designed to provide advanced knowledge and skills in the diagnosis and repair of automatic transmissions and transaxles. The student will develop skills in reading transmission hydraulic control circuit schematics. The student will perform diagnosis of electronically controlled automatic transmissions and transaxles. The student will dis-assemble and re-assemble an automatic overdrive transaxle. The use of pressure gauges, scan tools and other test equipment will be practiced.

(39.6 Lec. Hrs./ 59.4Lab Hrs.)

Prerequisites or Co-requisites: AUT116 and AUT232

AUT817 Automotive Engine Performance III 3 cr.

The course will present automotive emissions, emission control devices and 5-gas analysis. This course is designed to help the student improve his/her ability to diagnose driveability problems. Diagnosis and testing will be discussed and practiced. A review of fuel, ignition and computer system testing will also be included.

(34.7 Lec. Hrs./74.3 Lab Hrs.)

Prerequisites or Co-requisites: AUT606, AUT802 and AUT811

COM102 Communication Skills 3 cr.

The purpose of this course is to prepare the student to communicate effectively in business and professional situations. The major emphasis is on improving interpersonal skills, on using standard English in writing and speaking, on gaining proficiency in listening, and on composing specific types of business communications.

(59.4 Lec. Hrs.)

Prerequisite: Appropriate placement based on assessment.

AUT911 COOPERATIVE WORK EXPERIENCE 4 cr.

Cooperative Education Experience will integrate classroom theory with on-the-job training. The College will assist the student in securing employment which will be related to the student's major field of study and/or career interests. Under the supervision of the College and the employer, the student participates in job training experiences. In addition to employment, attendance at scheduled on-campus seminars is required. Seminars may include job searching skills as well as professional development. Student eligibility consists of the successful completion of 12 credit hours with EICCD with at least two courses in the chosen major and maintenance of a grade point average of 2.25 or higher.

(Variable Coop Hrs.)

Prerequisite: Consent of instructor.

BCA188 Business Computer Apps 3 cr.

This course will cover microcomputer operating systems, hardware and application software. Word processing, Internet search, file management, software installation and auto tech information systems will be specific areas of coverage. Lab exercises will follow lecture and class discussion.

(39.6 Lec. Hrs./59.4 Lab Hrs.)

WEL331 Welding Fundamentals 2 cr.

This course is designed especially for Auto Technology and Diesel Technology students. The weld processes that will be studied are those that are currently being used in auto and truck repair centers. Competencies that will be developed are intended to provide entry-level skills. This course is not designed to provide the skills required for weld certification.

(19.8 Lec. Hrs./59.4 Lab Hrs.)

HUM105 Working in America 3 cr.

A humanities course which has as its theme the interplay of work and the individual. It focuses on technological society and how the humanities can interpret and reflect upon that society.

(59.4 Lec. Hrs.)