Automotive Repair Technology

Program Syllabus
1st Year Fall-Spring Semesters

Southwestern Community College
Creston, IA

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Automotive Repair Technology

Welcome

America’s love affair with the automobile has brought about increased safety, performance and creature comfort systems that require high levels of skill to diagnose and repair. With this increased competency level comes a growing demand for skilled technicians with higher pay levels and benefit programs with plenty of work as more and more vehicles enter the road systems will guarantee us job security.

A career that once was thought of as a blue collar, dirty work environment that employed primarily men, who worked well with their hands, did not require a great deal of training or knowledge, has yielded to significant changes. Today’s technical advances in automobile design, safety, performance and comfort levels require the expertise of a trained and skilled “Automotive Technician: that replaced the backyard “mechanic.” Women have now found welcome positions in the automotive field, bringing with them high skill levels for attention to detail and application of technical knowledge to the various aspects of diagnosis and repairs. Technicians must now possess knowledge of mathematic formulas, simple physics, chemistry, and the ability to communicate, both written and verbally. In addition to basic mechanical skills, automotive technicians must have up-to-date computer technology, teamwork, problem solving, decision-making, and time management skills.

The learner outcomes of this program are designed to prepare the student for an entry-level position into the diagnosis and repair of automotive systems and other automotive related trades plus prepare the student for Automotive Service Excellence (ASE) certification.

This course is designed to balance hands-on shop lab learner outcomes with classroom instruction. Working with the latest technical equipment and techniques to diagnose, repair, and service mechanical, driveability, chassis, electrical, safety, and ventilation systems, just to name a few.

Fundamentals of quality auto repair will be covered in this course. Successful graduates will be more proficient and better prepared for entry-level positions in the automotive field, advanced trade extension courses, indentured apprenticeships or further on-the-job training. ASE certification is encouraged, as instructional groundwork has been used utilizing National Automotive Technicians Education Foundation (NATEF) standards.
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Program Description

Automotive Repair Technology:
In this program, students will learn theory, diagnostics and repair procedure in basic automotive areas such as air conditioning, electricity, brakes, steering, and suspension systems. Maintenance and light repairs are the fastest growing segment in automotive repair technology. Salaries and benefits reflect this need as independent repair shops, dealerships and franchised shops are employing technicians specializing in one-day repairs. Students who complete the 1-year program receive a diploma in automotive repair. Students who complete the two-year program are awarded the associate of applied science degree in automotive repair technology.

General Program Information

Instructor Contact Information:

Instructors
Jeff Sorensen
Office – Room #413
Classroom – Room #418
Phone # - (641) 782-1394
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Classroom – Room #402B
Phone# - (641) 782-1393
E-mail – schmaizried@swcciowa.edu

Required Program Materials

Textbook:
Modern Automotive Technology
James E. Duffy
Goodheart – Wilcox 2004

Workbook:
Modern Automotive Technology
Goodheart – Wilcox 2004

ANSI Approved Safety Glasses

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Automotive Repair Technology

Southwestern Community College

Purpose Statement:
Southwestern Community College exists in order that Area XIV community members have the opportunity to gain skills and knowledge sufficient for successful employment, higher education achievement, or adult and continuing education.

Special Accommodation Statement:
Southwestern Community College provides a variety of accommodations for qualified students with disabilities. Students requesting special accommodations are urged to contact the Special Needs Coordinator, at 641-782-7081, ext 458. Students with special needs are encouraged to plan ahead for accommodations. Southwestern Community College recognizes that student’s needs may change during their time of enrollment and accommodation plans may change accordingly.

Nondiscrimination:
Southwestern Community College prohibits discrimination in employment and it’s education programs and activities on the basis of race/color, national origin, religion/creed, age, marital status, disability, sex, veteran status, sexual orientation, gender identity or associational preference. Southwestern Community College also affirms it’s commitment to providing equal nondiscrimination policy may be directed to: Education Equity Coordinator, Southwestern Community College, 1501 W. Townline St., Creston, Iowa, 50801, 641-782-1456 or 1-800-247-4023 ext. 456.

Academic Integrity Policy:
Academic freedom is a fundamental right in any institution of higher learning. Honesty and integrity are necessary preconditions of this freedom. Academic integrity requires that all academic work be wholly the product of an individual or individuals. Joint efforts are legitimate only when the assistance of others is explicitly acknowledged. Ethical conduct is the obligation of every member of the college community, and breaches of academic integrity constitute serious offenses. Refer to this section of the Student Handbook for further details.

Plagiarism:
Plagiarism is the representation of the words or ideas of another as one’s own in any academic exercise. To avoid plagiarism, every direct quotation must be identified by quotation marks or by appropriate indentation and must be cited in the text or in a footnote or in bibliography or works cited page. Acknowledgement is required when material from another source stored in print, electronic or other medium is paraphrased or summarized in whole or in one’s own words. Refer to Student Handbook for examples of plagiarism.
Automotive Repair Technology

Mission Statement:
To prepare automotive repair technology students for entry level positions in the automotive industry with attention to diagnosis, repair, and maintenance service procedures for common automotive systems with emphasis to doing quality repairs.

Our Commitment to You:
- To bring our technical expertise and real-life experiences to you in a qualified instructional program setting.
- To challenge you to do your best.
- To balance classroom instruction with hands-on lab experience.
- To answer your questions

Your Commitment to Yourself:
- To show up every day on time.
- To present an attitude to learn.
- To make the best use of your time.
- To study materials presented.
- To develop and maintain a good work ethic.
- To put a little “spring in your step.”

With this in mind you will succeed, anything less—you are cheating yourself of life-long knowledge. Like anything in life—you get out what you put into it.

(Note: The terms and conditions of this syllabus are subject to change.)
Automotive Repair Technology
1st Year

Course Description
Fall-Spring

Fall Semester:

AUT 104 Introduction to Automotive Technology   3 credits
This course provides a student to look into the field of automotive repairs and it’s aspects. The student will be introduced to the number of different systems incorporated into today’s automobiles. The student will gain insight as to the instructors teaching styles and their expectations and procedures. The student will gain knowledge in proper handling of hand, power, and precise measuring tools. The student will be given the proper guidelines as to the constant safety procedures that must be followed in a working automotive shop lab.

AUT 503 Automotive Brake Systems   3 credits
This course will provide introduction and instruction in the theory of operation, diagnosis principles, and service procedures of automotive braking systems.

AUT 404 Automotive Suspension and Steering   4 credits
This course will provide introduction and instruction in the theory of operation, diagnosis principles, and service procedures of automotive suspension and steering systems. It will also introduce the student to wheel alignment terminology, diagnosis principles, and basic service procedures.
Spring Semester:

**AUT 603 Basic Automotive Electricity  3 credits**
This course will provide introduction and instruction in electrical theory and basic electrical circuits. The student will be introduced into the safe handling and operating techniques used electrical diagnostic equipment. Safety, meters, and service information will be emphasized.

**AUT 652 Advanced Automotive Electricity  3 credits**
This course is designed to provide further instruction in diagnosis, repair, and service of electrical and electronic components found in all automotive systems.

**AUT 704 Automotive Heating and Air Conditioning  4 credits**
This course will provide introduction and instruction in the theory of design and operation of automotive heating, ventilation, and air conditioning systems. Students will learn how to diagnose, service, and repair automotive heating, ventilation and air conditioning systems. Students will have the opportunity to receive air conditioning service certification with a satisfactory completion of this course.
Automotive Repair Technology

Methods of Assessment and Grading

The grades assigned in Automotive Repair Technology are as follows:

A= Excellent  F= Failure
B= Above Average  I= Incomplete
C= Average  W= Withdraw
D= Below Average

Grades of A through D are awarded to students who are able to achieve the behavioral objectives listed in the syllabus of each course. Grades will be based on the following percentages:

90-100% = A
80-89% = B
70-79% = C
60 – 69% = D
59% and below = F

For those students with final scores below 60% or unable to complete the behavioral objectives:

Grade of “F” will be given.
Grade of “I” will be given to those unable to complete course due to an excused reason.
Grade of “W” will be given for those who officially withdraw from class.

Students must maintain a 2.0 grade point average to graduate.

Grades will be tabulated as follows:

50% Laboratory (Hands On)- Learner outcomes will compromise 50% of total grade. Each course will have a learner outcome check off list provided by National Automotive Technicians Education Foundation (NATEF) standards. Each learner outcome objective will be worth up to 5 points. If student misses shop lab due to absence he or she will need to make an appointment to make-up learner outcome(s). Make-up learner outcome(s) will need to be completed within one week with the exception to final semester learner outcome(s) and those need to be made up in one day by appointment.
**Rating Criteria:**

5= Excellent – all steps correct – No assistance needed.
4= Good – Most steps correct – Little assistance needed.
3= Above Average.
2= Average – Needs practice – Assistance needed.
1= Below Average – Does not understand – A lot of assistance needed.
0= Failed or did not attempt.

**25% Tests**- Unit test and semester tests will compromise 25% of total grade. If student misses a test due to absence he or she will have one week to make up that test, except semester tests. Semester tests need to be made up in one day by appointment. Students will have the option to retake one unit test per course with the average of the two tests taken as a score to improve their test score.

**15% Quizzes and Assignments**- Daily assignments, quizzes, and other assignments will compromise 15% of total grade. No make up will be allowed for missed quizzes. A point value of “0” will be awarded for missed quizzes. Late assignments must be turned in within one week of due date. Late assignments are worth half of original value. After one week a score of “0” will be awarded for late or missing assignments.

**10% Employability Skills**- Employability skills will comprise 10% of total grade. Punctuality, attendance, work ethic, housekeeping, judgment, use of time, initiative, ability to learn, quality of work and attitude are the components of employability skills grade.
Automotive Repair Technology

Safety Rules and Regulations

1. **Safety glasses must be worn in designated shop areas at all times.**

2. **No work will be done in the shop or computer lab except during designated class time.**

3. **No work will be done in shop or computer lab except during designated class time.**

4. Facemasks or goggles may need to be worn when operating power tools, equipment or machinery, which creates particulate matter (i.e. grinders, sanders, welders, torches).

5. Hard hats will be worn at instructor’s discretion.

6. Wear proper clothing-this is a working shop atmosphere.
   a. Do not wear loose fitting clothing or articles that may be caught in moving machinery, equipment or power tools.
   b. **NO** open toed footwear.
   c. It is **highly recommended** that boot-type footwear be worn in shop area.

7. All power equipment will be shut off when not in use.

8. Do not leave power equipment or machinery unattended when on.

9. **DO NOT USE** tools, equipment or machinery you have not been instructed on how to use.

10. Use the proper tool for the job at hand.

11. When operating equipment with another student, make sure which student is the operator.


13. **DO NOT** hold a conversation with someone operating power tools, equipment or machinery. The distraction may cause an accident.

14. **Never** operate power tools, equipment or machinery without proper safety guards in place.

15. When using air, be sure that no one will be a target of the blast.

16. Unsafe work practices or safety hazards are to be reported to your instructor.

17. Any accident or injury, regardless how minor; will be reported to your instructor immediately.

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18. Students are responsible for carrying their own medical insurance for injuries and illnesses sustained while a student at Southwestern Community College. If you do not have medical insurance and would like to purchase coverage, information is available at the Registrar’s desk.

19. No horseplay, running, scuffling, etc. in school facilities.

20. No cell phones allowed in classrooms or shop lab area, if you need to be reached for an emergency, you can be reached by calling 641-782-7081, SWCC receptionist will contact you.

Cell Phone Policy:
Southwestern Community College believes in providing an environment conducive to learning. For this reason, cellular phone use should be kept to minimum on campus and conducted in appropriate locations only. Cell phone users should be respectful of others.

1. Students should turn cell phones off or to silent mode upon entering any classroom, computer lab, library, or auditorium.
2. If necessary, students may conduct short, quiet cellular phone conversations in the hallways, away from doorways or outside the building.
3. Cellular phones with picture taking capabilities are not allowed in locker rooms or weight rooms.
4. Faculty members have the right to limit the use of cell phones with picture taking and text messaging capabilities in their classrooms.
5. Students who fail to comply with the above regulations will be referred to the Director of Student Services and will be considered in violation of the student code of conduct.

21. This is a smoke-tobacco free campus, use of tobacco materials, by of age students is prohibited.

Smoke-Tobacco Free Campus:
In cooperation with recent legislation, Southwestern Community College will be in compliance with the Smoke-Free Air Act (H.F. 2212), by implementing a Smoke/Tobacco Free policy effective at all locations as of July 1, 2008.

Smoking and the use of tobacco is prohibited on any college owned property and on any college facility; this includes all buildings, grounds, sidewalks, parking lots, and vehicles.

All SWCC employees, students, visitors and contractors are required to comply with this policy. Notices of the smoke/tobacco free policy have been displayed at all college locations.

For more information regarding the provisions of the Smoke-Free Air Act, please visit the following website: http://www.iowasmokefreeair.gov/
22. No one other than Automotive Repair Technology students are allowed to work in shop lab area (i.e. no family, friends, etc.)

23. No children allowed in classrooms or shop area.

**Children on Campus Policy:**

Southwestern Community College strives to maintain a quality-learning environment and has established the following guidelines regarding children on campus.

1. Students will not be allowed to bring children with them in the instructional setting which includes, but is not limited to, the classroom, the library, the student center, etc.
2. When children are present on campus, they must be under the direct supervision of a parent, legal guardian, registered student or other authorized adult.
3. This policy does not intend to conflict with Southwestern Community College programs designed for the involvement of children. For example: 8th day career day, youth camps, business contests, vocational open houses, etc.
4. Students who fail to comply with the above regulations will be referred to the Director of Student Services and will be considered in violation of the student code of conduct.

**Note:** Non-conformity to Safety Rules and Regulations is subject to suspension and/or expulsion.
Automotive Repair Technology

Eye Safety Law
Notification Form

I have been informed that the Iowa School Safety Law requires that I wear eye protecting devices at all times while participating or while others are participating in any activity which may subject me to risk and hazard of eye injury.

I also now know that in this lab, I will be using materials or processes that could put me at risk. Because of being informed, I promise to wear proper safety glasses or prescription glasses with side shields at all times while in this lab.

I also have been informed that the first violation will be a warning, the second violation will be a temporary suspension, and the third violation, cancellation of my registration.

_________________________________  ____________________________
(Student)                        (Date)

_________________________________  ____________________________
(Parent/Guardian)                 (Date)

1st Violation ____________________

2nd Violation ____________________

3rd Violation ____________________

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Southwestern Community College  
Career Academy  
Student Disciplinary Citation

Student Name____________________________________________________________

Student’s School _________________________________________________________

Date of Occurrence ________________       Program/Site _________________________

First/ Second/ Third disciplinary action with this student. (Circle respective number.)

This document is a reprimand for actions carried on by student, which interfered with or disrupted the positive production and/or academic achievement for all students in the class.

Description of Action ______________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Student’s Signature ___________________________________ Date ________________

Instructor’s Signature _________________________________ Date ________________

SWCC Administrator’s Signature _______________________ Date ________________

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**Student Conduct Policy**

*Students are expected to conduct themselves in a manner that will not interfere with the instructor’s responsibility to teach or with the student’s right to learn. Students need to keep in mind that this is a work-oriented program and that their conduct will have an affect on their grade. Upon the first offense that interferes with the educational process, a disciplinary citation will be documented and a personal conference will be held with the instructor to discuss the situation. Upon the second offense, a second disciplinary citation will be documented, a conference will be held with a SWCC Administrator, the instructor, and the student, and the student’s High School Administration will be notified. Upon the third offense, documentation will be filed, and determination will be made by the Director of Student Services as to whether the student should be removed from the program.*
ATTENDANCE POLICY FOR TECH PREP PROGRAMS

Tech Prep programs offer students the opportunity to:

- Earn college credit while attending high school
- Easily transition to college
- Gain self-esteem and self-confidence
- Develop career focus and achieve academic/personal goals

Our goal is to provide you with skills that will be valuable in future employment. Attendance is mandatory for our programs to present the curriculum and provide hands-on experience. Nine months is a relatively short time to expose you to the classroom materials and activities needed to develop these skills. Absenteeism only deprives you and the other students of precious time. Absenteeism is one of the top concerns of potential employers. Excessive absence is not tolerated past 3-5 days a year in the industry, and will not be tolerated here as well.

Southwestern Community College Tech Prep programs will allow 3 ‘unexcused’ days per semester for whatever reason: sick time, doctors, dentists, funeral, work, etc. Any absences past this allowance will require a letter be sent from Student Services placing the student on an Educational Contract. This contract will state that should the student miss two additional days, a meeting will be held between the student, parent, school and SWCC staff to discuss what requirements the student must meet in order to continue the program.

The only “excused” absence is when the student presents a letter signed by a school administrator stating that the student is participating in a school sponsored event or under military orders. All school suspensions will count as unexcused absences, and no makeup days will be allowed. Notes from parents are considered “unexcused” absences.

It is the student’s responsibility to be in class at the appointed time. It is assumed that all students will have the interest, maturity, motivation and discipline to arrive at class on time. Late arrivals miss valuable information and can cause disruption to the instructor’s daily plans. For this reason, 3 tardies will count as 1 ‘unexcused’ absence.

Student’s Signature ___________________
Date _______________________________
Instructor’s Signature ___________________
Date _______________________________

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Temporary Closing Policy:
Every effort will be made to keep the college open. However, should inclement weather or other emergencies necessitate closing the college or delaying the start of classes, the decision will be made between 5:00 – 5:30 A.M. and will be announced on the following.

Radio Stations:
- KSIB-KITR Creston AM 1520 FM 101.3
- KOAK-KCSI Red Oak AM 1080 FM 95.3
- KMA Shenandoah AM 960
- WHO Des Moines AM 1040
- KELR Chariton FM 105.5
- KJAN Atlantic AM 1220

Television Stations:
- KCCI-TV8 Des Moines
- WHO-TV13 Des Moines
- WOI-TV5 Ames/Des Moines
- KKTV-TV3 Omaha
- WOWT-TV6 Omaha

Also posted on Southwestern Community College web-site: www.swcciowa.edu

2-Hour Late Start Information:
When inclement weather causes the college to have a 2-hour late start, the following procedures will be followed.

If the 2-hour late start occurs on a Monday, Wednesday, or Friday, the classes will start at 9:40 AM (7:30 am and 8:35 am classes will not meet). Offices will open at 9:00 AM.

If the 2-hour late start occurs on Tuesday or Thursday, then classes will start at 9:00 AM (7:30 am classes will not meet). Offices will open at 9:00 AM.
PURPOSE: Employers need and prefer to hire students who demonstrate good work habits, dependability, and other desirable traits. This evaluation will be scored on a point system as shown below.

### ATTITUDE – APPLICATION TO WORK

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Mid-Term</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Outstanding in enthusiasm</td>
<td>□ 4</td>
<td>□ 4</td>
</tr>
<tr>
<td>3</td>
<td>Very interested and industrious</td>
<td>□ 3</td>
<td>□ 3</td>
</tr>
<tr>
<td>2</td>
<td>Average in diligence and interest</td>
<td>□ 2</td>
<td>□ 2</td>
</tr>
<tr>
<td>1</td>
<td>Somewhat indifferent</td>
<td>□ 1</td>
<td>□ 1</td>
</tr>
<tr>
<td>0</td>
<td>Definitely not interested</td>
<td>□ 0</td>
<td>□ 0</td>
</tr>
</tbody>
</table>

### PUNCTUALITY

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Mid-Term</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Tardy 0-2 times</td>
<td>□ 4</td>
<td>□ 4</td>
</tr>
<tr>
<td>3</td>
<td>Tardy 3-4 times</td>
<td>□ 3</td>
<td>□ 3</td>
</tr>
<tr>
<td>2</td>
<td>Tardy 5-6 times</td>
<td>□ 2</td>
<td>□ 2</td>
</tr>
<tr>
<td>1</td>
<td>Tardy 7-8 times</td>
<td>□ 1</td>
<td>□ 1</td>
</tr>
<tr>
<td>0</td>
<td>Tardy 9-10 times</td>
<td>□ 0</td>
<td>□ 0</td>
</tr>
</tbody>
</table>

### HOUSEKEEPING

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Mid-Term</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Excellent</td>
<td>□ 4</td>
<td>□ 4</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>□ 3</td>
<td>□ 3</td>
</tr>
<tr>
<td>2</td>
<td>Average</td>
<td>□ 2</td>
<td>□ 2</td>
</tr>
<tr>
<td>1</td>
<td>Below Average</td>
<td>□ 1</td>
<td>□ 1</td>
</tr>
<tr>
<td>0</td>
<td>Poor</td>
<td>□ 0</td>
<td>□ 0</td>
</tr>
</tbody>
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### ATTENDANCE

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Mid-Term</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Never Missed</td>
<td>□ 4</td>
<td>□ 4</td>
</tr>
<tr>
<td>3</td>
<td>Missed 1 day</td>
<td>□ 3</td>
<td>□ 3</td>
</tr>
<tr>
<td>2</td>
<td>Missed 2 days</td>
<td>□ 2</td>
<td>□ 2</td>
</tr>
<tr>
<td>1</td>
<td>Missed 3 days</td>
<td>□ 1</td>
<td>□ 1</td>
</tr>
<tr>
<td>0</td>
<td>Missed 4 days or more</td>
<td>□ 0</td>
<td>□ 0</td>
</tr>
</tbody>
</table>

### WORK ETHIC

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Mid-Term</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Very good</td>
<td>□ 4</td>
<td>□ 4</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>□ 3</td>
<td>□ 3</td>
</tr>
<tr>
<td>2</td>
<td>Average</td>
<td>□ 2</td>
<td>□ 2</td>
</tr>
<tr>
<td>1</td>
<td>Below Average</td>
<td>□ 1</td>
<td>□ 1</td>
</tr>
<tr>
<td>0</td>
<td>Poor</td>
<td>□ 0</td>
<td>□ 0</td>
</tr>
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</table>

### USE OF TIME

<table>
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<tr>
<th>Grade</th>
<th>Description</th>
<th>Mid-Term</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Very Good</td>
<td>□ 4</td>
<td>□ 4</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>□ 3</td>
<td>□ 3</td>
</tr>
<tr>
<td>2</td>
<td>Average</td>
<td>□ 2</td>
<td>□ 2</td>
</tr>
<tr>
<td>1</td>
<td>Below Average</td>
<td>□ 1</td>
<td>□ 1</td>
</tr>
<tr>
<td>0</td>
<td>Poor</td>
<td>□ 0</td>
<td>□ 0</td>
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</table>

### JUDGEMENT

<table>
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<th>Grade</th>
<th>Description</th>
<th>Mid-Term</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Exceptionally good in judgment</td>
<td>□ 4</td>
<td>□ 4</td>
</tr>
<tr>
<td>3</td>
<td>Above average in making decisions</td>
<td>□ 3</td>
<td>□ 3</td>
</tr>
<tr>
<td>2</td>
<td>Usually makes the right decisions</td>
<td>□ 2</td>
<td>□ 2</td>
</tr>
<tr>
<td>1</td>
<td>Often uses poor judgment</td>
<td>□ 1</td>
<td>□ 1</td>
</tr>
<tr>
<td>0</td>
<td>Consistently uses bad judgment</td>
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### QUALITY OF WORK

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<th>Description</th>
<th>Points</th>
<th>Semester</th>
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<tr>
<td>4</td>
<td>Good speed – good number of projects completed</td>
<td>40 – 36</td>
<td>A</td>
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<tr>
<td>3</td>
<td>Above average speed – above average number of projects completed</td>
<td>35 - 32</td>
<td>B 80 – 89%</td>
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<tr>
<td>2</td>
<td>Average speed – sufficient work completed</td>
<td>31 – 28</td>
<td>C 70 – 79%</td>
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<tr>
<td>1</td>
<td>Below average speed – needs to pick up the pace</td>
<td>27 – 25</td>
<td>D 60 – 69%</td>
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<tr>
<td>0</td>
<td>Very slow – doesn’t complete enough work</td>
<td>24 – Below</td>
<td>F 60% - Below</td>
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### ABILITY TO LEARN

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<tr>
<td>4</td>
<td>Learned work exceptionally well</td>
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<tr>
<td>3</td>
<td>Learned work quickly</td>
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<tr>
<td>2</td>
<td>Average in understanding work</td>
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<tr>
<td>1</td>
<td>Rather slow in learning</td>
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<tr>
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<td>Very slow to learn</td>
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### INITIATIVE

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<td>Proceeds well on owe</td>
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<tr>
<td>3</td>
<td>Goes ahead independently at times</td>
<td>□ 3</td>
<td>□ 3</td>
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<tr>
<td>2</td>
<td>Does all assigned work</td>
<td>□ 2</td>
<td>□ 2</td>
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<tr>
<td>1</td>
<td>Hesitates</td>
<td>□ 1</td>
<td>□ 1</td>
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<tr>
<td>0</td>
<td>Must be pushed frequently</td>
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Total Points: 0 0
Percent: 0% 0%
Grade: 0 0
Automotive Repair Technology

Course Outline
Fall-Spring

Fall Semester

First 5 weeks:
Introduction to Automotive Technology AUT 104

1. Read Modern Automotive Technology (text)
   a. Chapter 1 The Automobile pages 1-21
   b. Chapter 2 Automotive Careers and ASE Certification pages 22-33
   c. Chapter 3 Basic Hand Tools pages 34-47
   d. Chapter 4 Power Tools and Equipment pages 48-60
   e. Chapter 5 The Auto Shop and Safety pages 61-69
   f. Chapter 6 Automotive Measurement and Math pages 70-84
   g. Chapter 7 Using Service Information pages 85-96
   h. Chapter 9 Fastener, Gaskets, Seals, and Sealants pages 111-126
   i. Chapter 10 Vehicle Maintenance, Fluid Service, and Recycling pages 127-142

2. Lectures
3. PowerPoint presentations
4. Video
5. Demonstrations and lab Practicalities (written and hands-on)
6. Lab assignments (learner outcomes)(written and hands-on)
7. Daily assignments (written and hands-on)
8. Quizzes
9. Chapter and Semester exams (written and hands-on)
10. Guest speaker(s)

Second 5 weeks:
Automotive Brake Systems AUT 503

1. Read Modern Automotive Technology (text)
   a. Chapter 71 Brake System Fundamentals pages 1353-1377
   b. Chapter 72 Brake System Diagnosis and Repair pages 1378-1405
   c. Chapter 73 Anti-lock Brakes, Traction Control, and Stability Control pages 1406-1428

2. Lectures
3. PowerPoint presentations
4. Videos
5. Demonstrations and Lab Practicalities (written and hands-on)
6. Lab assignments (learner outcomes)(written and hands-on)
7. Daily assignments (written and hands-on)
8. Quizzes
9. Chapter and Semester exams (written and hands-on)
10. Guest speaker(s)

Last 6 weeks:
Automotive Suspension and Steering AUT 404

1. Read Modern Automotive Technology (text)
   a. Chapter 65 Tire, Wheel, and Wheel Bearing Fundamentals pages 1227-1242
   b. Chapter 66 Tire, Wheel, and Wheel Bearing Service pages 1243-1263
   c. Chapter 67 Suspension System Fundamentals pages 1264-1285
   d. Chapter 68 Suspension System Diagnosis and Repair pages 1286-1307
   e. Chapter 69 Steering System Fundamentals pages 1308-1330
   f. Chapter 70 Steering System Diagnosis and Repair pages 1331-1350
   g. Chapter 74 Wheel Alignment pages 1429-1449

2. Lectures
3. PowerPoint presentations
4. Videos
5. Demonstrations and Lab Practicalities (written and hands-on)
6. Lab assignments (learner outcomes)(written and hands-on)
7. Daily assignments (written and hands-on)
8. Quizzes
9. Chapter and Semester exams (written and hands-on)
10. Guest speaker(s)
Automotive Repair Technology

Course Learner Outcomes

Introduction to Automotive Technology AUT 104

Chapter 1 The Automobile
You will be able to:
1. Identify and locate the most important parts of a vehicle.
2. Describe the purpose of the fundamental automotive systems.
3. Explain the interaction of automotive systems.
4. Describe major automobile design variations.

Chapter 2 Automotive Careers and ASE Certification
You will be able to:
1. List the most common automotive careers.
2. Describe the type of skills needed to be an auto technician.
3. Explain the tasks completed by each type of auto technician.
4. Summarize the ASE certification program.

Chapter 3 Basic Hand Tools
You will be able to:
1. Identify common automotive hand tools.
2. List safety rules for hand tools.
3. Describe the type of skills needed to be an auto technician.
4. Maintain and store tools properly
5. Use hand tools safely.

Chapter 4 Power Tools and Equipment
You will be able to:
1. List the most commonly used power tools and equipment.
2. Describe the uses for power tools and equipment.
3. Explain the advantages of one type of tool over another.
4. Explain safety rules that pertain to power tools and equipment.

Chapter 5 The Auto Shop and Safety
You will be able to:
1. Describe the typical layout and sections of an auto shop.
2. List the types of accidents that can occur in an auto shop.
3. Explain how to prevent auto shop accidents.
4. Describe general safety rules for the auto shop.
**Chapter 6 Automotive Measurement and Math**
You will be able to:
1. Describe both customary and metric measuring systems.
2. Identify basic measuring tools.
3. Describe the use of common measuring tools.
4. Use conversion charts.
5. List safety rules relating to measurement.
6. Summarize basic math facts.

**Chapter 7 Using Service Information**
You will be able to:
1. Describe the different types of service manuals.
2. Find and use the service manual index and contents section.
3. Explain the different kinds of information and illustrations used in an information manual.
4. Describe the three basic types of troubleshooting charts found in service manuals.
5. Explain how to use computer based service information.

**Chapter 9 Fasteners, Gaskets, Seals, and Sealants**
You will be able to:
1. Identify commonly used automotive fasteners.
2. Select and use fasteners properly.
3. Remove, select, and install gaskets, seals, and sealants.
4. Summarize safety rules relating to fasteners, gaskets, seal, and sealants.

**Chapter 10 Vehicle Maintenance, Fluid Service, and Recycling**
You will be able to:
1. Check a car’s fluid levels.
2. Explain the importance of vehicle maintenance.
3. Locate fluid leaks.
4. Perform automotive common fluid changes.
5. Inspect for general problems with hoses, belts, and other compartments.
6. Demonstrate safe practices while working with vehicle fluids.
Automotive Repair Technology

Course Learner Outcomes

Automotive Brake Systems AUT 503

Chapter 71 Brake System Fundamentals
You will be able to:
1. Explain the hydraulic and mechanical principles of a brake system.
2. Identify the major components of an automotive brake system.
3. Define the basic functions of the major parts of a brake system.
4. Compare drum and disc brakes.
5. Describe the operation of parking brakes.
6. Explain the operation of power brakes.

Chapter 72 Brake System Diagnosis and Repair
You will be able to:
1. Diagnose common brake system problems.
2. Inspect and maintain a brake system.
3. Describe basic procedures for servicing a master cylinder and brake booster.
4. Explain how to service a disc brake system.
5. Explain how to service a drum brake system.
6. Describe the procedures for both manual and pressure bleeding of a brake system.
7. Cite the safety rules that should be followed when servicing brake systems.

Chapter 73 Anti-Lock Brakes, Traction Control, and Stability Control
You will be able to:
1. Identify the major parts of a typical anti-lock brake system.
2. Describe the operation of anti-lock brake systems.
3. Diagnose Problems in anti-lock brake systems.
4. Repair anti-lock brake systems.
5. Describe the purpose and operation of traction control and stability control systems.
6. Diagnose and repair traction control and stability control systems.
Automotive Repair Technology

Course Learner Outcomes

Automotive Suspension and Steering AUT 404

Chapter 65 Tire, Wheel, and Wheel Bearing Fundamentals
You will be able to:
1. Identify the parts of a tire and wheel.
2. Describe the different methods of tire construction.
3. Explain tire and wheel sizes.
4. Describe tire ratings.
5. Identify the parts of driving and non-driving hub and wheel bearing assemblies.

Chapter 66 Tire, Wheel, and Wheel Bearing Service
You will be able to:
1. Diagnose common tire, wheel, and wheel bearing problems.
2. Describe tire inflation and rotation procedures.
3. Measure tire and wheel runout.
4. Explain static and dynamic wheel balance.
5. Summarize different methods of balancing wheel and tires.
6. Explain service procedures for wheel bearings.
7. Describe safety practices while servicing tires, wheels, and wheel bearings.

Chapter 67 Suspension System Fundamentals
You will be able to:
1. Identify the major parts of a suspension system.
2. Describe the basic function of each suspension system component.
3. Explain the operation of the four common types of springs.
4. Compare the various types of suspension systems.
5. Explain automatic suspension leveling systems.

Chapter 68 Suspension System Diagnosis and Repair
You will be able to:
1. Diagnose problems relating to a suspension system.
2. Replace shock absorbers and ball joints.
3. Describe the removal and replacement of springs.
4. Service a strut assembly.
5. Replace control arm bushings.
6. Describe and use safe work procedures while repairing suspension system repairs.
7. Diagnose and repair electronically controlled suspension systems.
Chapter 69 Steering System Fundamentals
You will be able to:
1. Identify the major parts of a steering system.
2. Explain the operating principles of steering systems.
3. Compare the difference between a linkage steering and rack and pinion steering system.
4. Describe the operation of hydraulic and electronic-assist power steering systems.
5. Explain the operation of four-wheel steering systems.

Chapter 70 Steering System Diagnosis and Repair
You will be able to:
1. Describe common steering system problems.
2. Properly inspect and determine the condition of a steering system.
3. Explain basic steering column repair procedures.
4. Adjust both worm gears and rack and pinion steering gears.
5. Describe service and repair procedures for a rack and pinion steering gear.
6. Service power steering belts, hoses, and fluid.
7. Explain how to complete basic power steering system tests.
8. Describe and use safe work procedures while performing steering system diagnosis, service, and repairs.

Chapter 74 Wheel Alignment
You will be able to:
1. Explain the principles of wheel alignment.
2. List the purpose of each wheel alignment setting.
3. Perform a pre-alignment inspection of tires, steering, and suspension systems.
4. Describe caster, camber, and toe adjustments.
5. Explain toe-out on turns, steering axis inclination, and tracking.
6. Describe the use of different types of wheel alignment equipment.
Automotive Repair Technology

Course Outline
Fall-Spring

Spring Semester

First 5 weeks:
Basic Automotive Electricity AUT 603

1. Read Modern Automotive Technology (text)
   a. Chapter 8 Basic Electricity and Electronics pages 97-110
   b. Chapter 29 Automotive Batteries pages 491-500
   c. Chapter 30 Battery Testing and Service pages 501-516
   d. Chapter 31 Starting System Fundamentals pages 517-528
   e. Chapter 32 Starting System Testing and Repair pages 529-547
2. Lecture
3. PowerPoint presentations
4. Videos
5. Demonstrations and Lab Practicalities (written and hands-on)
6. Lab Assignments (learner outcomes) (written and hands-on)
7. Daily assignments (written and hands-on)
8. Quizzes
9. Chapter and Semester exams (written and hands-on)
10. Guest speaker(s)

Second 5 weeks:
Advanced Automotive Electricity AUT 652

1. Read Modern Automotive Technology (text)
   a. Chapter 33 Charging System Fundamentals pages 548-563
   b. Chapter 34 Charging System Diagnosis, Testing, and Repair pages 564-581
   c. Chapter 37 Lights, Instrumentation, Wipers, and Horns-Operation and Service pages 647-681
   d. Chapter 38 Sound Systems and Power Accessories pages 683-709
   e. Chapter 77 Restraint Systems pages 1505-1517
   f. Chapter 78 Restraint System Service pages 1518-1527
   g. Chapter 79 Security and Navigation Systems, New and Future Technologies pages 1528-1540
2. Lectures
3. PowerPoint Presentations
4. Videos
5. Demonstrations and Lab Practicalities (written and hands-on)
6. Lab assignments (learner outcomes) (written and hands-on)
7. Daily assignments (written and hands-on)
8. Quizzes
9. Chapter and Semester exams (written and hands-on)
10. Guest speaker(s)

Last 6 weeks:
Automotive Heating and Air Conditioning AUT 704

1. Read Modern Automotive Technology (text)
   a. Chapter 39 Cooling System Fundamentals pages 711-729
   b. Chapter 40 Cooling System Testing, Maintenance, and Repair pages 730-751
   c. Chapter 75 Heating and Air Conditioning Fundamentals pages 1453-1476
   d. Chapter 76 Heating and Air Conditioning Service pages 1477-1501
2. Lectures
3. PowerPoint presentations
4. Videos
5. Demonstrations and Lab Practicalities (written and hands-on)
6. Lab assignments (learner outcomes)(written and hands-on)
7. Daily assignments (written and hands-on)
8. Quizzes
9. Chapter and Semester exams (written and hands-on)
10. Guest speaker(s)
Automotive Repair Technology

Course Learner Outcomes

Basic Automotive Electricity AUT 603

Chapter 8 Basic Electricity and Electronics
You will be able to:
1. Explain the principles of electricity.
2. Describe the action of basic electric circuits.
3. Describe the principles of magnetism and magnetic fields.
4. Identify basic electric and electronic terms, symbols, and components.
5. Explain different kinds of automotive wiring.
6. Perform fundamental electrical tests.
7. Describe and use safe handling procedures for electrical systems and components.

Chapter 29 Automotive Batteries
You will be able to:
1. Explain the operating principles of a lead-acid battery.
2. Describe the basic parts of an automotive battery.
3. Compare conventional and maintenance-free batteries.
4. Explain how temperature and other factors affect battery performance.
5. Describe and utilize safety practices that should be followed when working with batteries.

Chapter 30 Battery Testing and Service
You will be able to:
1. Visually inspect a battery for obvious problems.
2. Perform common battery tests.
3. Clean battery case and terminals.
4. Properly charge a battery.
5. Describe and perform proper jump-starting procedures.
6. Replace a defective battery.
7. Describe and use proper safety practices when testing and servicing batteries.

Chapter 31 Starting System Fundamentals
You will be able to:
1. Explain the principles of an electric motor.
2. Describe the construction and operation of a starter motor.
3. List and describe the functions of the main starter drive parts.
4. Explain and compare the differences of starter motor designs.
5. Describe starting system safety features.
**Chapter 32 Starting System Testing and Repair**

*You will be able to:*

1. Diagnose common starting system problems.
2. Make orderly starter system repairs.
3. Remove and replace a starter motor.
4. Explain and perform typical procedures for a starter motor rebuild.
5. Describe how to diagnose and service starting system safety devices.
6. Describe the safety practices that should be followed when testing and repairing a starting system.
Automotive Repair Technology

Course Learner Outcomes

Advanced Automotive Electricity AUT 652

Chapter 33 Charging System Fundamentals
You will be able to:
1. List the parts to a charging system.
2. Explain charging system operation.
3. Describe the construction of major charging system components.
4. Compare generator design differences.
5. Explain charging system indicators.
6. Describe safety practices to follow when working with charging systems.

Chapter 34 Charging System Diagnosis, Testing, and Repair
You will be able to:
1. Diagnose charging system problems.
2. Inspect a charging system.
3. Test charging system output with a voltmeter and load tester.
4. Remove, test, repair, and replace a generator.
5. Adjust generator belt(s).
6. Describe and perform safety practices to follow when testing or repairing automotive charging systems.

Chapter 37 Lights, Instrumentation, Wipers, and Horns-Operation and Service
You will be able to:
1. Explain the operating principles of an automotive light, wiper, and horn system.
2. Diagnose problems in light, wiper, and horn systems.
3. Summarize automatic light and wiper systems.
4. Explain and perform headlamp system aiming.
5. Explain both analog and digital instrumentation systems.
6. Diagnose common instrumentation problems.
7. Summarize how to remove and service instrumentation clusters.
8. Describe safety practices to follow when testing and servicing light, wiper, horn, and instrumentation systems.
Chapter 38 Sound Systems and Power Accessories
You will be able to:
1. Describe the operation of a radio.
2. Explain the basic difference between AM and FM radios.
3. Diagnose basic sound system problems.
4. Explain, diagnose, and service power window systems.
5. Explain, diagnose, and service power lock systems.
6. Summarize the operation and testing of a speed control system.
7. Describe and follow safety practices that must be followed when working with electrical accessory systems.

Chapter 77 Restraint Systems
You will be able to:
1. Explain how vehicle body and frame construction works with restraint systems to protect a vehicle’s occupants.
2. Identify and locate the most important parts of a vehicle restraint system.
3. Describe the purpose of restraint systems.
4. Describe restraint system design variations.
5. Summarize the operation of restraint system sensors, inflator modules, and electronic control modules.

Chapter 78 Restraint System Service
You will be able to:
1. Explain how to inspect and repair seat belts.
2. Summarize how to scan restraint systems for problems.
3. Describe and follow safety rules for working with air bag systems.
4. Summarize the procedure for air bag replacement.
5. Explain how to replace air bag sensors.
6. Describe how to service an air bag controller.
7. Describe and follow safety rules for working with supplemental restraint systems.
Automotive Repair Technology

Course Learner Outcomes

Automotive Heating and Air Conditioning AUT 704

Chapter 39 Cooling System Fundamentals
You will be able to:
1. Summarize the functions of a cooling system.
2. Explain the operation and construction of major cooling system components.
3. Compare cooling system design variations.
4. Explain the importance of antifreeze.
5. Discuss the safety procedures to follow when working with cooling systems.

Chapter 40 Cooling System Testing, Maintenance, and Repair
You will be able to:
1. List common cooling system problems and their symptoms.
2. Describe the most common causes of system leakage, overheating, and overcooling.
3. Perform a combustion leak test and a pressure test.
4. Check the major parts of a cooling system for proper operation.
5. Replace faulty cooling system components.
6. Drain, flush, and refill a cooling system.
7. Describe safe working practices to use when testing, maintaining, or repairing a cooling system.

Chapter 75 Heating and Air Conditioning Fundamentals
You will be able to:
1. Explain the principles of refrigeration.
2. Explain the methods of heat transfer.
3. Describe the cycles of refrigeration.
4. Describe the high and low-pressure sides of an air conditioning system.
5. Explain the basic function and construction of each major part of typical heating and air conditioning system.
6. Summarize the operation and interaction of heating, ventilation, and air conditioning systems.
7. Describe safety precautions to be observed when working on heating and air conditioning systems.
Chapter 76 Heating and Air Conditioning Service
You will be able to:
1. Visually inspect a heating and air conditioning system and locate obvious troubles.
2. Diagnose common heating and air conditioning problems.
3. Describe the functions and uses of air conditioning test equipment.
4. Locate air conditioning and heating system leaks.
5. Explain how to replace major heating and air conditioning components.
6. Describe the general procedures for evacuating and charging an air conditioning system.
7. Demonstrate safe working practices when servicing heating and air conditioning equipment.
Automotive Repair Technology  
1st Year Fall-Spring Semesters

Personnel Record

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Last Revision on 4/18/2007
Automotive Repair Technology

Syllabus Acknowledgement

I, _________________________, hereby acknowledge that I have received, read, understand, and agree to all terms and policies set forward in course syllabus for Automotive Repair Technology, presented to me. I understand that infractions of terms and policies set by Southwestern Community College could lead to my withdrawal from classes.

Name of Student ___________________________

Student’s Signature _________________________

Name of Parent/Guardian ____________________

Signature of Parent/Guardian __________________

Date ____/____/_____