Alternative Fueled Vehicles

Automotive Technology Department
College of Applied Sciences and Arts
Southern Illinois Carbondale

Instructor: Blaine Heisner  
Office: TEC 0160B
Phone: (618) 453-4024  
Email: bheisner@siu.edu

Class Calendar

Meeting Time: 1:00PM-4:50PM  
April 4 – May 6  
Mon, Tues, Thurs, Fri.  
(Wed. by arrangement)

Final Exams
Last test given on last day of class

Class Location
Lab: TEC 0177  
Classroom: TEC 0171

Prerequisite
None

Office Hours
Tuesdays & Thursdays 9am-noon

Course Calendar

No SIUC Holidays within course

Excused Absence for religious holidays – Students absent from classes because of required observances of major religious holidays will be excused. It is the student’s responsibility to notify in advance the instructor of each class that will be missed. Students must also take the responsibility for making up work missed.

University Calendar

No SIUC Holidays within course

No SIUC Holidays within course

Course Description:

Study of alternative fuel and energy systems, fuel delivery systems, alternative propulsion systems, and hybrid and alternative fueled propulsion. Study of energy conversion, battery design, fuel cells, and renewable and fossil fuel included. Environmental concerns with current legislative actions will be discussed. Laboratory includes demonstrations with alternative fueled propulsion. Not for graduate credit.

Course Objectives:

1. Know what alternative fuels are and why they are utilized.
2. Understand gaseous fuel technology in internal combustion applications.
3. Understand electric drive technology in automotive applications.
4. Understand compression ignition internal combustion technology.
5. Understand “Flex-Fuel” technology and the use of alcohol as a fuel.
Topical Outline:

I. Alternative Fuel Overview
   A. Introduction to alternative fuels
   B. History of early transportation

II. Automotive Emissions Overview
   A. Petroleum
   B. Automotive Emissions reduction history
   C. Future Emissions predictions
   D. World-wide Emissions considerations

III. Gaseous Fuels
   A. Propane
   B. Natural Gas(Methane)
   C. Hydrogen

IV. Alcohol Based Fuels
   A. Ethanol
   B. Methanol
   C. Flex Fuel Technology

V. Compression Ignition Engines(Diesel)
   A. Fuel systems
   B. Biodiesel
   C. Alternative diesel fuels

VI. Electric Drive
   A. Fuel source
      i. Battery types
      ii. Capacitor
      iii. Fuel Cell
   B. Regenerative Braking
   C. Hybrid technology
   F. Plug-in hybrid technology

NOTE:
• Topics listed above may be introduced at various times.
• Additional information/handouts may be introduced during class.

Article/Research Assignments

Students will be required to complete various research assignments. Students will be given appropriate notice before assignments are due. Assignments may include, but not limited to, researching information on the web or other sources, summarizing information, providing arguments for and/or against information, and presenting information during class. Students will be given credit for completing all aspects of each given assignment. All assignments turned into the instructor must be typed.
**Lab Work**

This class will include lab activities and all students are expected to participate fully during these times. Laboratory work may consist of specific assignments, “Live Jobs”, instructor assigned work, and multimedia presentations. Lab work may include topics included in other weeks’ lessons. This work must be performed in a timely manor to maximize the benefit to the student. Students will be expected to observe all program and shop regulations and participate in maintaining a clean and safe work environment. Lab activities may be graded, or used to determine any “participation points” used to determine a student’s final grade. Creation of “service procedures” or lab write-ups may be included and graded as well.

**Grading and Testing**

Short quizzes may be given at the instructor’s discretion without advance notice to the students. Quizzes cannot be made up. Exams will typically be given on a timetable relative to the completion of a particular segment of course material. Exams will require students to recognize industry terminology, demonstrate solid understanding of course material, and use this ability to process information to solve problems. The majority of the student’s grade will be from exam scores.

The total points a student acquires at the end of the class will determine the final class grade. Points accumulated by the student will be the product of:

- Quizzes
- Exams
- Research assignments
- Class Participation/Lab work

Student accumulated points are divided by the total number of points possible to present a percentage score. Deductions for attendance are then taken.

Students will be notified beforehand, for preparation time, to the scheduling of exams. Exams will be administered as needed according to class progress. **Unless prior arrangements have been made with the instructor, any missed exam must be made up on the first day following the absence in which you return to class, outside of class time.** Quizzes are given at the instructor’s discretion and cannot be made up. Participation in class discussions and enthusiasm in laboratory work will affect borderline grade situations. The instructor will add the participation grade at his/her discretion based upon their interpretation of the student’s attitude and performance. Participation points can only be used to improve a student’s grade.

Students should be aware that texting, sleeping, disrupting the class, and not actively participating in lab activities and discussions will affect their participation grade.

**Scholastic standards:**

A = 100-93%
B = 92-87%
C = 86-76%
D = 75-70%
F = 69 and below
Attendance Policy

Attendance is required as part of the class grade. Safety glasses must be available every class period. Attendance will be taken at the beginning of each class. To change an absence to a tardy, it is the student’s responsibility to notify the instructor, during break time or after class, that they are present.

The Automotive Department’s attendance policy will be implemented as follows:

- Being late for class three (3) times will equal one (1) absence.
- Excessive absences may lead the student to a conference with the Chairperson of the Department of Applied Technologies before rejoining his/her class.

Required Student Materials

1. Toolbox with tools as per listed for enrollment into the automotive program. (A list may be obtained at the administration office.)
2. Safety glasses.
3. Notebook paper or laptop for note taking.
4. Access to the internet or libraries for research.

Note – Please notify the instructor as soon as possibly of any disability or medical condition that may require additional assistance.

Emergency Procedures:

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on the BERT’s website at www.bert.siu.edu, Department of Public Safety’s website www.dps.siu.edu (disaster drop down) and in the Emergency Response Guidelines pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

Emergency Contact Information

In case of emergency, call 88-911 FROM A CAMPUS PHONE. Do not use a cell phone to make a 911 call. Be prepared to give the following information:

- Nature of the Emergency
- Condition of the victims
- Location: Carterville Campus of SIU
  
  **Building #2818 (L-3)**
## Individual Performance Tracking Sheet
(Students should complete this tracking sheet if they wish to know their grade mid-term)

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<th>Activity (i.e. quiz, exam, assignment)</th>
<th>Points earned</th>
<th>Points possible</th>
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### Course Attendance Review

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Southern Illinois University
Automotive Technology
Student Information Sheet

PRINT CLEARLY
(please fill out and return to instructor as soon as possible)

Name ________________________________ ID# ____________________________

1. Local Address ________________________________
   City ________________________________
   Phone #: ___________________________ E-mail __________________________

2. Home Address ________________________________
   City ________________________________ State ___________ Zip ___________
   Phone #: ___________________________

Past automotive work experience and for how long:
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Indicate which of the following applies to you:
Attended auto classes in high school _______________
Attended auto classes at a community college ___________
What ASE Areas are you certified in? ____________________________

What is your immediate occupational goal upon graduation from SIU?
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

What is your occupational goal five years after you have completed your education at SIU?
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

If you have any medical conditions, of which your instructor should be aware, please indicate below:
__________________________________________________________________
__________________________________________________________________