
Title: **Clean Air & Energy Independence: An Overview of Alternative Fuels & Advanced Technology Vehicles**

Credit Hours: **1**

Catalog Number: **AUTO- 106**

Instructor: **Joseph Moore**

Lecture (or Lab): **1 hour lecture**

Office: **207-741-5859** email: **jmoore2@smccme.edu**

Total Contact Hours: **15**

Course Syllabus

Course Description

This course will introduce students to eight alternative fuels and advanced technology vehicles. Ethanol, methanol, and synthetic fuels; compressed or liquefied natural gas; battery powered electric vehicles; hydrogen powered vehicles; propane; fuel cells; and biodiesel will be covered. Topics include each fuel's source and its use in transportation, the basic scientific principles behind each type of vehicle and its components, advantages and disadvantages of each fuel and vehicle including performance issues, and infrastructure requirements of each fuel and vehicle type. The course will consider how well each alternative helps achieve the goals of cleaner air and energy independence for the United States. Students will examine availability of the fuels, the vehicles, and service for the vehicles.

Course Objectives

Upon successful completion of this course, the student will be able to:

- Explain the environmental impact of pollution caused by motor vehicles.
- Describe the consequences of U.S. dependence on foreign sources of oil.
- Recognize the efforts to legislate air quality at the federal, state, and local levels.
- Define the term "alternative fuel."
- Discuss the sources, uses, advantages, and disadvantages of
 - Battery-powered electric vehicles

- Hybrid electric vehicles
 - Hydrogen-powered vehicles
 - Fuel cells
 - Ethanol, Methanol, and Synthetic fuels
 - Biodiesel
 - Natural gas
 - Propane
- State what actions must be taken in order to work toward clean air and energy independence.

Topical Outline of Instruction

1. Why do we need alternative fuels?
2. Legislating air quality
3. Battery-powered electric vehicles
4. Hybrid electric vehicles
5. Hydrogen-powered vehicles
6. Fuel cells
7. Ethanol, methanol, and synthetic fuels
8. Biodiesel
9. Natural gas
10. Propane (LP gas)
11. What is next?

Course Requirements

- Students will successfully complete homework, quizzes, and tests.

Student Evaluation and Grading

10% Attendance and Participation

10% Homework

20% Quizzes

30% Tests

30% Practice of Safety and Shop Participation

Attendance Policy

Students missing 15% of the total hours for the course, tardy or absent, will result in an administrative failure for the class. This equals 2.3 hours for this 1 credit course.

Office Hours

Appointments can be made to accommodate student needs.

Learning Outcomes

1. When necessary, utilize information-literacy skills, including evaluation of information from a variety of media and proper MLA and/or APA documentation.
2. Use critical thinking and listening skills in written and oral communication as a tool for learning.
3. Read and demonstrate understanding of complex ideas by identifying key concepts.
4. Apply theory to practice using problem solving techniques and data analysis.
5. Solve problems using algebraic techniques.
6. Interpret information presented in charts and graphs or illustrate a scenario using graphic techniques.
7. Utilize quantitative methods to solve and/or assess complex problems to support decision making, forecasting, and recommendations.
8. Participate in a direct experience of scientific inquiry of the natural world using the scientific method.
9. Find and evaluate credible sources of scientific information using a variety of media to support a research need.
10. Demonstrate the capacity to make informed and ethical judgments about the impact of science and technology on the self, the environment, and the practice of sustainability.

Text, Tools and/or Supplies

The suggested text is *Clean Air and Energy Independence: An Overview of Alternative Fuels and Advanced Technology Vehicles* ISBN 978-1-933954-10-3

Required personal protective equipment must be worn at all times in lab.

End-of-Course Evaluation

In order to gain access to final course grades, students must complete evaluations for each course attended at SMCC. Evaluations are submitted online and can be accessed through the student portal site. Students can access the course evaluation report beginning two weeks before the end of classes. The deadline for

submission of evaluations occurs 24 hours after the last day of classes each semester. Instructors will announce when the online course evaluation is available.

ADA Syllabus Statement

Southern Maine Community College is an equal opportunity/affirmative action institution and employer. For more information, please call 207-741-5798.

If you have a disabling condition and wish to request accommodations in order to have reasonable access to the programs and services offered by SMCC, you must register with the disability services coordinator, Mark Krogman, who can be reached at 741-5629. There will be some documentation for your teachers that must be supplied before accommodations can be given. Further information about services for students with disabilities and the accommodation process is available upon request at this number.

SMCC Pay-for-Print Policy

Students can print 150 pages per semester free of charge. If you print over 150 pages, you will be charged 10 cents per page to your student billing account for tuition and fees.

Leftover pages from each semester will not be rolled over to the following semester.

The College's pay-for-print system monitors printing on all public printers (i.e. those in general access labs, library printers, the Academic Achievement Center, Noisy Lounge and technology labs). Each time you log-in to the system, the print station displays the remaining print quota. Once the printing quota has been exceeded, users will be charged \$ 0.10 per page or \$.05 per side if the printer prints on both sides on their student accounts on a monthly basis. Color printouts will be charged at 11 page units. This means each color printout will count as 11 pages toward the quota and will cost \$1.10.

Add-Drop Policy

Students who drop a course during the one-week "add/drop" period in the fall and spring semesters and the first three days of summer sessions receive a 100% refund of the tuition and associated fees for that course. Please note any course that meets for less than the traditional semester length, i.e., 15 weeks, has a pro-rated add/drop period. There is no refund for non-attendance.

Withdrawal Policy

A student may withdraw from a course only during the semester in which s/he is registered for that course. The withdrawal period is the second through twelfth week of the fall and spring semesters and the second through ninth week of twelve-week summer courses. This period is pro-rated for shorter-length courses. To withdraw from a course, a student must complete and submit the appropriate course withdrawal form, available at the Enrollment Service Center (no phone calls, please). The designation “W” will appear on the transcript after a student has officially withdrawn. A course withdrawal is an uncompleted course and may adversely affect financial aid eligibility. Failure to attend or ceasing to attend class does not constitute withdrawal from the course. There is no refund associated with a withdrawal.

Plagiarism Statement

Adherence to ethical academic standards is obligatory. Cheating is a serious offense, whether it consists of taking credit for work done by another person or doing work for which another person will receive credit. Taking and using the ideas or writings of another person without clearly and fully crediting the source is plagiarism and violates the academic code as well as the Student Code of Conduct. If it is suspected that a student in any course in which s/he is enrolled has knowingly committed such a violation, the faculty member should refer the matter to the College’s Disciplinary Officer and appropriate action will be taken under the Student Code of Conduct. Sanctions may include suspension from the course and a failing grade in the course. Students have the right to appeal these actions to the Disciplinary Committee under the terms outlined in the Student Code of Conduct.