

DET 190 Course Outline as of Summer 2006**CATALOG INFORMATION**

Dept and Nbr: DET 190 Title: ALT FUELS AND SYSTEMS
 Full Title: Alternative Fuels and Fuel Systems
 Last Reviewed: 2/13/2006

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	4.00	17	Lecture Scheduled	68.00
Minimum	3.00	Lab Scheduled	6.00	8	Lab Scheduled	102.00
		Contact DHR	0		Contact DHR	0
		Contact Total	10.00		Contact Total	170.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 136.00

Total Student Learning Hours: 306.00

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As: AUTO 190

Formerly:

Catalog Description:

This course will provide an introduction to non-traditional fuels and conversion of internal combustion fuel systems to natural gas, bio-fuels, and other alternative fuel systems.

Prerequisites/Corequisites:**Recommended Preparation:**

Course Completion of DET 87 (or DET 64) and Course Eligibility for ENGL 100

Limits on Enrollment:**Schedule of Classes Information:**

Description: This course will provide an introduction to non-traditional fuels and conversion of internal combustion fuel systems to natural gas, bio-fuels, and other alternative fuel systems.

(Grade Only)

Prerequisites/Corequisites:

Recommended: Course Completion of DET 87 (or DET 64) and Course Eligibility for ENGL 100

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:

IGETC:	Transfer Area	Effective:	Inactive:
---------------	----------------------	------------	-----------

CSU Transfer:	Effective:	Inactive:
----------------------	------------	-----------

UC Transfer:	Effective:	Inactive:
---------------------	------------	-----------

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Outcomes and Objectives:

Upon successful completion of the course students will be able to:

1. Differentiate between traditional and "alternative" fuel.
2. Identify U.S. Department of Energy fuels classified as "alternative" to gasoline.
3. Discuss the benefits of alternative fuels.
4. Discuss clean air legislation.
5. Explain the origin, manufacture and use of alternative fuels.
6. Relate specific alternative fuels to their appropriate application.
7. Define fuel system and system component operations.
8. Explain safe procedures for fuel handling.
9. Employ maintenance directions related to alternative fuel system care.
10. Perform inspection and testing procedures for alternative fuel systems.
11. Assess maintenance and repair needs on specific units and complete needed repairs and maintenance.
12. Convert traditional fuel vehicle engines and/or components to alternative fuel engines and/or components.
13. Discuss and apply personal, shop, and environmental safety procedures.

Topics and Scope:

1. Clean fuels: An Overview
 - a. traditional fuels
 - b. alternative fuels
 - c. clean air legislation
2. Fuel types, origin, manufacturing and use
 - a. refined fuels

- b. bio-fuels
- c. gaseous fuels
- 3. Alternative fuel systems
 - a. fuel injection
 - b. compressed gas systems
 - c. liquefied gas systems
 - d. vehicle fueling stations
- 4. Alternative Fuel Conversions
 - a. bio diesel
 - b. ethanol
 - c. SVO (straight vegetable oil)
 - d. in-wheel electrically generated hybrid
 - e. direct injected hybrids
 - f. performing alternative fuel conversions
- 5. Fuel handling safety procedures
 - a. personal
 - b. environmental
 - c. regulations
- 6. Fuel and fuel system maintenance and repairs
 - a. scheduled maintenance
 - b. system diagnosis
 - c. component repair or replacement
 - d. work orders

Assignment:

Representative assignments:

1. Readings (approximately 5-10 pages per week) and discussion of traditional and alternative fuels.
2. Field trips (1-4) to local alternative fuel facilities and refining facility.
3. Field notes.
4. Lab activities. Labs activities may vary from semester to semester and may include but are not limited to:
 - a. Fabrication of alternative fuel processors
 - b. Performing simple alternative fuel conversions
 - c. Installation of pre-made alternative fuel kits
 - d. Perform efficiency tests on alternative fuel systems.
 - e. Maintenance and repair/replacement activities.
5. Lab reports.
 - a. Write analyses of efficiency tests.
 - b. Write recommendations regarding needed adjustments or repairs.
6. Write work orders and perform services for custom installation jobs.
7. Final project: research and written report (3-5 pages) on a selected alternative fuel technology or related topic. In-class presentation.
8. Final exam.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Field notes. Final project report; work orders.

Writing
10 - 20%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab reports, Fuel efficiency tests and analyses.

Problem solving
10 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Fabrication/conversions/installation/maintenance.

Skill Demonstrations
20 - 40%

Exams: All forms of formal testing, other than skill performance exams.

Short answer.

Exams
10 - 20%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation; class presentation

Other Category
5 - 10%

Representative Textbooks and Materials:

Instructor prepared materials.