JCC OFFICIAL COURSE OUTLINE

Course number, title and credits; total time allocation

Course Number	ALT 270/AUT 160	Credits	3	Title	Alternative Fuels		
Lecture/Discussion	2 hrs/semester	Lab	1 hrs/semester	Clinical	0 hrs/semester		

Catalog description and Pre- and Co-requisites (Same as taxonomy and catalog)

This course is an overview of alternative fuels used in automobiles and light trucks. Students learn about various alternate fuels, their effect on exhaust emissions, their effect on the environment, the economic impact of alternate fuels, and how they contribute to the reduction of importing foreign oil. Topics include hydrogen, fuel cells, natural gas (CNG& LNG), propane (LP gas), ethanol, methanol, and biodiesel.

Knowledge, skills and abilities Students Acquire from this Course (Educational Objectives)

- Explain the environmental impact of pollution caused by motor vehicles
- Describe the consequences of US 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, disadvantages, and production of propane, natural gas, ethanol, methanol, synthetic fuels, biodiesel, battery-powered electric vehicles, hybrid electric vehicles, hydrogen-powered vehicles, and fuel cells.
- Labs will provide students with the opportunity to create biodiesel from waste vegetable oil and test and operate a fuel cell.

Associate Degree Outcomes Addressed in this Course (These must appear in course syllabus)

ADO 7 In order to meet ADO 7 the class requires students to think critically and solve problems. This course requires that students think critically about the need for, and production of, alternative fuels . Students are also required to demonstrate their knowledge and expertise of alternative fuels through a project and labs.

Units/topics of Instruction

- Why do we need Alternative Fuels?
- Laws, Regulations, Programs, and Incentives
- Propane Vehicles
- Natural Gas Vehicles
- Ethanol, Methanol, and Synthetic Fuels
- Bio-Diesel
- Battery Powered Electric Vehicles
- Hybrid Electric Vehicles
- Hydrogen Powered Vehicles
- Fuel Cells
- What's Next?

Instructional Techniques and Procedures

The instructor will rely primarily on a course packet, class PowerPoint presentations, and handout materials.

Instructional Use of Computer or Other Technology

Instructor will use Marcraft Fuel Cell Trainer and a biodiesel processor for demonstration and lab purposes.

Instructional Materials and Costs to Students

Marcraft Fuel Cell Trainer and a Bio-Diesel processor.
Textbook: Course Packet prepared by the instructor

Skills and abilities students should bring to the course

Able to read	☒ a limited amount of material ☐ an average amount of material ☐ an above average amount of material	Able to compute	☐ basic, pre-algebraic problems ☒ simple algebraic problems ☐ higher order mathematical problems
Able to read	☐ relatively easy material ☒ moderately difficult material ☐ technical or sophisticated material	Able to write	☒ short compositions ☐ medium length compositions ☐ lengthy compositions
Able to use technology	☐ keyboard skills/familiar with computer ☒ computer application ☐ web navigation	Other necessary abilities	☐ ☐ ☐

The course is usually scheduled

Day: ☐ Fall ☐ Winter ☐ Spring

Evening: ☒ Fall ☒ Winter ☐ Spring

Prepared by Mark Rabinsky **Date** March 2, 2010

Approved by Dept. **Date**

Approved by Dean **Date**

Approved by Curriculum Committee **Date**