

**Clackamas Community College**  
Online Course/Outline Submission System

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**Section #1 General Course Information****Department:** Manufacturing**Submitter**

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**Course Prefix and Number:** RET - 240**# Credits:** 4**Contact hours**

Lecture (# of hours):  
Lec/lab (# of hours): 88  
Lab (# of hours):  
Total course hours: 88

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Alternative Fuels**Course Description:**

Offers students familiarity and entry level skills to work with alternative fuel systems. Explores (technically, economically and ecologically) the following alternative fuels: bio-diesel, vegetable oils, electricity, ethanol, hydrogen, propane, methanol, natural gas, heat engines, fuel cell & hybrid vehicles.

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**Type of Course:** Career Technical Preparatory

Is this class challengeable?

**Yes**

Can this course be repeated for credit in a degree?

**No**

Is general education certification being sought at this time?

**No**

Does this course map to any general education outcome(s)?

**No**

Is this course part of an AAS or related certificate of completion?

**Yes**

**Name of degree(s) and/or certificate(s):** Manufacturing AAS

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Fall**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

1. summarize the history of fuels and how the industrial revolution changed our usage of fuels, and what effect that has on our society now;
2. scientifically evaluate advantages & disadvantages of alternative fuels based on information learned inside and outside of class,
3. describe the differences between alternative different fuels' fuels and fossil fuels,
4. describe different fuels, fuel characteristics, performance, safety, environmental issues, emissions, availability, economics, political structure; how to produce and store fuels; and determine what applications the fuel is used in;
5. explain what Peak Oil is, what Global Warming is and how emissions affect the world;
6. perform a cost analysis of each fuel to show the true cost of alternative and fossil fuels, as well as the role of fuel tax subsidies;
7. describe how waste streams can be utilized to create fuel or manufacture new products for farms, municipal facilities and homes,
8. understand and describe what is going on in the world currently with alternative fuels (Current Affairs),
9. perform tank inspections for gaseous fuels, and become certified by DOT.

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***This course does not include assessable General Education outcomes.***

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**Major Topic Outline:**

1. Definition of Terms & Units used in the field.
2. Utilizing Conversion Factors and how to calculate energy density.
3. What is Renewable Energy and why do we need to know about it?
4. History of Fuels and how it affects mankind in history prehistoric, industrial revolution and now.
5. Conventional Fuels
6. Environmental Impact of Conventional Fuels.
7. Alternative Fuels Comparisons (Fuel characteristics, storage, distribution, production, performance, safety, applications, environmental issues & emissions, economics, current affairs, availability, politics, and waste stream recovery processes) for each of the common alternative fuels listed in the course description.

**Does the content of this class relate to job skills in any of the following areas:**

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

**First term to be offered:**

**Next available term after approval**

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