



Western Technical College

## 32412411 Alternative Fuels

### Course Outcome Summary

#### Course Information

<b>Description</b>	A practical study of the theories and procedures for the operation and preventive maintenance of non-traditional fuels and systems.
<b>Career Cluster</b>	Transportation, Distribution and Logistics
<b>Instructional Level</b>	Technical Diploma Courses
<b>Total Credits</b>	1
<b>Total Hours</b>	36

#### Textbooks

*Fundamentals of Medium/Heavy Duty Commercial Engines*. 2nd Edition. Copyright 2020. Duffy, Owen C. and Gus Wright. Publisher: Jones & Bartlett Publishers. **ISBN-13:** 978-1-284-15093-3. Required.

#### Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** To be discussed in class. Required.

Six inch ankle high, quality leather work shoes - \$75.00-100.00. **Vendor:** To be discussed in class. Required.

#### Success Abilities

1. Live Responsibly: Embrace Sustainability

#### Course Competencies

1. Investigate Compressed Natural Gas (CNG) as a fuel source.

##### Assessment Strategies

- 1.1. Written Product

##### Criteria

*You will know you are successful when:*

- 1.1. you pick one type of fuel source used in today's trucking industry.

- 1.2. you include why this is the best fuel (can include diesel as a fuel) to use.
- 1.3. you include the current availability of the fuel.
- 1.4. you include the cost to produce.
- 1.5. you include the projected available supply.
- 1.6. you produce a paper that is at least one page in length.
- 1.7. you include a minimum of two sources.
- 1.8. you produce a product which is typed.
- 1.9. you produce a product which is single-spaced.

#### **Learning Objectives**

- 1.a. Identify sources for compressed natural gas.
- 1.b. Describe transport for compressed natural gas.
- 1.c. Describe compression techniques for storage.
- 1.d. Describe delivery system options for use.

## **2. Investigate Liquid Natural Gas (LNG) as a fuel source.**

#### **Assessment Strategies**

- 2.1. Written Product

#### **Criteria**

*You will know you are successful when:*

- 2.1. you pick one type of fuel source used in today's trucking industry.
- 2.2. you include why this is the best fuel (can include diesel as a fuel) to use.
- 2.3. you include the current availability of the fuel.
- 2.4. you include the cost to produce.
- 2.5. you include the projected available supply.
- 2.6. you produce a paper that is at least one page in length.
- 2.7. you include a minimum of two sources.
- 2.8. you produce a product which is typed.
- 2.9. you produce a product which is single-spaced.

#### **Learning Objectives**

- 2.a. Describe creation of liquid natural gas.
- 2.b. Investigate transportation of liquid natural gas.
- 2.c. Describe delivery options for use.
- 2.d. Describe safe storage for liquid natural gas.

## **3. Investigate safety considerations related to alternative fuels.**

#### **Assessment Strategies**

- 3.1. Written Product

#### **Criteria**

*Performance will meet expectations when:*

- 3.1. you pick one type of fuel source used in today's trucking industry.
- 3.2. you include why this is the best fuel (can include diesel as a fuel) to use.
- 3.3. you include the current availability of the fuel.
- 3.4. you include the cost to produce.
- 3.5. you include the projected available supply.
- 3.6. you produce a paper that is at least one page in length.
- 3.7. you include a minimum of two sources.
- 3.8. you produce a product which is typed.
- 3.9. you produce a product which is single-spaced.

#### **Learning Objectives**

- 3.a. Investigate safe work requirements for handling alternative fuels.
- 3.b. Investigate regulations related to work area/ space.
- 3.c. Describe precautions related to servicing vehicles with alternative fuels.
- 3.d. Identify hazards that may lead to serious injury or death.
- 3.e. Describe environmental scans/tests used to assess work space safety (gas levels, etc..).
- 3.f. Describe tests required on space, storage, environment to ensure safety.

#### **4. Compare alternative fuel sources to conventional fuel sources.**

##### **Assessment Strategies**

4.1. Written Product

##### **Criteria**

*Performance will meet expectations when:*

- 4.1. you pick one type of fuel source used in today's trucking industry.
- 4.2. you include why this is the best fuel (can include diesel as a fuel) to use.
- 4.3. you include the current availability of the fuel.
- 4.4. you include the cost to produce.
- 4.5. you include the projected available supply.
- 4.6. you produce a paper that is at least one page in length.
- 4.7. you include a minimum of two sources.
- 4.8. you produce a product which is typed.
- 4.9. you produce a product which is single-spaced.

##### **Learning Objectives**

- 4.a. Summarize benefits of alternative fuels.
- 4.b. Summarize risks associated with alternative fuels.
- 4.c. Summarize cost factors related to use of alternative fuels.
- 4.d. Summarize environmental impact of alternative fuels.

#### **5. Explore preventative maintenance procedures for vehicles that use alternative fuels.**

##### **Assessment Strategies**

5.1. Written Product

##### **Criteria**

*You will know you are successful when:*

- 5.1. you pick one type of fuel source used in today's trucking industry.
- 5.2. you include why this is the best fuel (can include diesel as a fuel) to use.
- 5.3. you include the current availability of the fuel.
- 5.4. you include the cost to produce.
- 5.5. you include the projected available supply.
- 5.6. you produce a paper that is at least one page in length.
- 5.7. you include a minimum of two sources.
- 5.8. you produce a product which is typed.
- 5.9. you produce a product which is single-spaced.

##### **Learning Objectives**

- 5.a. Perform tank inspection and securement.
- 5.b. Perform fuel delivery system inspection.
- 5.c. Perform fuel filter maintenance.
- 5.d. Investigate engine service intervals.
- 5.e. Perform ignition system maintenance.