

# Electric & Hybrid Electric Vehicles 1st Edition

## Chapter 19 – Fuel Cells and Advanced Technologies

### Lesson Plan



#### **CHAPTER SUMMARY:**

1. Fuel-Cell Technology, Refueling with Hydrogen, and Direct Methanol Fuel Cells
  2. Fuel-Cell Vehicle Systems, Fuel-Cell Hybrid Vehicles, and Hydrogen Storage
  3. Ultracapacitors, Fuel-Cell Vehicle Transaxles, and HCCI
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#### **OBJECTIVES:**

1. Explain how a fuel cell generates electricity and list the advantages and disadvantages of fuel cells.
  2. List the types of fuel cells and vehicle systems that use them.
  3. Explain how ultracapacitors and transaxles work in fuel-cell hybrid vehicles.
  4. Discuss the use of hydraulic pressure as an energy source.
  5. Describe the HCCI combustion process.
  6. Discuss alternative electricity sources.
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#### **RESOURCES:** ([All resources may be found at jameshalderman.com](http://www.jameshalderman.com))

1. Task Sheet: Fuel Cell Identification
  2. Chapter PowerPoint
  3. [Crossword Puzzle and Word Search \(L3\)](#)
  4. [Videos: \(L3\) Light Duty Hybrid Electric](#)
  5. [Animations: \(L3\) Light Duty Hybrid Electric](#)
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#### **ACTIVITIES:**

1. Task Sheet: Fuel Cell Identification
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#### **ASSIGNMENTS:**

1. Chapter crossword and word search puzzles from the website.
  2. Complete end of chapter quiz from the textbook.
  3. Complete multiple choice and short answer quizzes downloaded from the website.
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#### **CLASS DISCUSSION:**

1. Review and group discussion chapter [Frequently Asked Questions](#) and [Tech Tips](#) sections.
  2. Review and group discussion of the five (5) chapter [Review Questions](#).
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#### **NOTES AND EVALUATION:**

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