

**Course:** DIES223 CNG Engines

**Department:** Diesel

**Course Description:**

This course covers the characteristics of compressed natural gas (CNG) and propane and how they are used as alternative power sources in internal combustion engines. Students learn the characteristics of alternative fuels, evaluate the storage and handling components of the alternative fuel system, and the safety procedures involved in working with these fuels. Students learn the theory behind the operation of gaseous fuel engines and are able to identify, service, and troubleshoot components unique to these engines. Primary focus is centered on the Cummins ISL-G and L10 G engines, although other manufacturers are discussed.

Lecture: 2 hours. Laboratory: 2 hours.

<b>COURSE OUTCOMES</b>	<b>SAMPLE OUTCOMES ACTIVITIES</b>	<b>SAMPLE ASSESSMENT TOOLS</b>
Upon successful completion of this course students should:	To achieve these outcomes students may engage in the following activities:	Student learning may be assessed by:
1. Identify various components used in compressed natural gas systems (WC, IL and CCT)	<ul style="list-style-type: none"><li>• Textbook readings</li><li>• On-line demonstration</li><li>• Video presentations</li><li>• Classroom discussions</li></ul>	<ul style="list-style-type: none"><li>• Tests, quizzes</li><li>• Mechanical drawings</li><li>• Homework assignments</li></ul>
2. Follow safety guidelines specific to CNG and propane systems; (CCT)	<ul style="list-style-type: none"><li>• Textbook and on-line readings</li><li>• Video presentations</li><li>• Classroom discussions</li><li>• Laboratory demonstrations</li></ul>	<ul style="list-style-type: none"><li>• Tests &amp; Quizzes</li><li>• In-class conversations</li><li>• Laboratory evaluations</li></ul>
3. Perform basic diagnostic tests and interpret results; (WC, CCT, and IL)	<ul style="list-style-type: none"><li>• Textbook and on-line readings</li><li>• Video presentations</li><li>• Classroom demonstrations</li></ul>	<ul style="list-style-type: none"><li>• Tests, quizzes</li><li>• Classroom discussion</li><li>• Laboratory work</li></ul>

<p>4. Evaluate filters, actuators, regulators, valves and tanks by inspection and testing (WC and IL)</p>	<ul style="list-style-type: none"> <li>• Textbook readings</li> <li>• Video presentations</li> <li>• Classroom collaborative learning</li> <li>• Classroom discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Test quizzes</li> <li>• Homework assignments</li> </ul>
<p>5. Understand (SI) spark ignition theory; (WC, IL)</p>	<ul style="list-style-type: none"> <li>• Textbook readings</li> <li>• Video presentations</li> <li>• Classroom collaborative learning</li> <li>• Classroom discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Test quizzes</li> <li>• Homework assignments</li> </ul>
<p>6. Correctly disassemble, inspect, repair and reassemble components; (CCT, IL)</p>	<ul style="list-style-type: none"> <li>• Textbook and on-line readings</li> <li>• Classroom presentations</li> <li>• Laboratory demonstrations</li> <li>• Class and Laboratory discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Tests, quizzes</li> <li>• Written assignments</li> <li>• Homework assignments</li> <li>• Laboratory assignments</li> </ul>

This course includes the following core competencies: Critical and Creative Thinking (CCT), Information Literacy (IL), and Written Communication (WC).