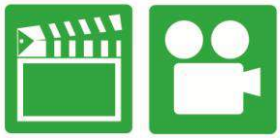
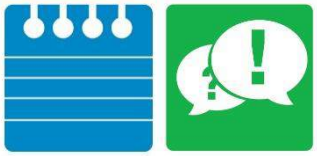
Automotive Electrical & Engine Performance 7/E

Chapter 10 Capacitance & Capacitors

Opening Your Class

KEY ELEMENT	EXAMPLES
Introduce Content	**This course or class covers Automotive Electrical & Engine Performance. It correlates material to task lists specified by ASE and NATEF.**
Motivate Learners	Explain how the knowledge of how something works translates into the ability to use that knowledge to figure why the engine does not work correctly and how this saves diagnosis time, which translates into more money.
State the learning objectives for the chapter or course you are about to cover and explain this is what they should be able to do as a result of attending this session or class.	Explain the chapter learning objectives to the students. 1. Explain capacitance. 2. Explain how a capacitor can be used to filter electronic noise, can store electrical charge, and can be used as a timer circuit. This chapter will help you prepare for the ASE Electrical/Electronic Systems (A6) certification test content area "A" (General Electrical/Electronic System Diagnosis)
Establish the Mood or Climate	Provide a *WELCOME,* Avoid put downs and bad jokes.
Complete Essentials	Restrooms, breaks, registration, tests, etc.
Clarify and Establish Knowledge Base	Do a round robin of the class by going around the room and having each student give their backgrounds, years of experience, family, hobbies, career goals, or anything they want to share.

NOTE: This lesson plan is based on Automotive Electrical & Engine Performance 7/E Chapter Images found on Jim's web site @ www.jameshalderman.com
LINK CHP 10: Chapter Images

ICONS	Ch10 Capacitance & Capacitors
	**1. SLIDE 1 CH10 CAPACITANCE/ CAPACITORS**
	**Check for ADDITIONAL VIDEOS & ANIMATIONS @ http://www.jameshalderman.com/** **WEB SITE IS CONSTANTLY UPDATED** **No VIDEOS FOR THIS CHAPTER. CHECK WWW.YOUTUBE.COM**
	**At the beginning of this class, you can download the crossword puzzle & Word Search from the links below to familiarize your class with the terms in this chapter & then discuss them** **Crossword Puzzle (Microsoft Word) (PDF)** **Word Search Puzzle (Microsoft Word) (PDF)**
	
	**2. SLIDE 2 EXPLAIN: CAPACITANCE & EXPLAIN Figure 10-1** Leyden jar can be used to store an electrical charge **3. SLIDE 3 EXPLAIN Figure 10-2** This simple capacitor, made of two plates separated by an insulating material, is called a dielectric. **4. SLIDE 4 EXPLAIN Figure 10-3** As the capacitor is charging, the battery forces electrons through the circuit **5. SLIDE 5 EXPLAIN Figure 10-4** When the capacitor is charged, there is equal voltage across the capacitor and the battery. An electrostatic field exists between the capacitor plates. No current flows in the circuit. **6. SLIDE 6 EXPLAIN Figure 10-5** The capacitor is charged through one circuit (top) and discharged through another (bottom) **7. SLIDE 7 EXPLAIN Figure 10-6** Capacitor symbols are shown in electrical diagrams. The negative plate is often shown curved
	**DISCUSS FREQUENTLY ASKED QUESTION**

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	8. **SLIDE 8 EXPLAIN FIGURE 10–7** A point-type distributor shown with the condenser from an old vehicle being tested on a distributor machine. **DEMONSTRATION: BUILD CIRCUIT ON PROJECT BOARD USING CAPACITOR & DEMO HOW TO TEST IT**
	**HAVE STUDENTS DUPLICATE THE DEMO ON PROJECT BOARD**
	**ANIMATION: Capacitor**
	9. **SLIDE 9 EXPLAIN Figure 10-8** A capacitor blocks direct current (DC) but passes alternating current (AC). A capacitor makes a very good noise suppressor because most of interference is AC and the capacitor will conduct this AC to ground before it can reach radio or amplifier 10. **SLIDE 10 EXPLAIN Figure 10-9** 1 farad capacitor used to boost the power to large speakers.
	**DEMONSTRATION: SHOW STUDENTS SEVERAL DIFFERENT TYPES OF CAPACITORS THAT ARE USED IN AUTOMOTIVE APPLICATIONS.**
	11. **SLIDE 11 EXPLAIN Figure 10-10** Capacitors in parallel effectively increase the capacitance 12. **SLIDE 12 EXPLAIN Figure 10-11** Capacitors in series decrease the capacitance.
	**BE SURE THAT CAPACITORS ARE FULLY DISCHARGED BEFORE WORKING NEAR THEM. INFORM STUDENTS THAT, BECAUSE A CAPACITOR STORES ELECTRICITY, IT CAN DELIVER A SHOCK TO A PERSON.**
	**NATEF TASK SHEET DIAGNOSE RADIO STATIC AND WEAK, INTERMITTENT, OR NO RADIO RECEPTION; DETERMINE NECESSARY ACTION**
	**HOMEWORK: SEARCH INTERNET** **HAVE THE STUDENTS USE INTERNET TO RESEARCH THE LEYDEN JAR. DISCOVER CONSTRUCTION OF ORIGINAL JAR & SCIENTISTS WHO CONSTRUCTED IT, AS WELL AS LATER MODIFICATIONS.**