

AUTO 110
Engine Technology
Syllabus

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Semester Begins: 8/20/2012

Ends: 12/04/2012

Textbook:

Modern Automotive technology (classroom) 7th edition

Modern Automotive technology (workbook) 7th edition By James E. Duffy ISBN
978-1-59070-957-3

Course description:

For students with little, or no, internal combustion engine background. Design, construction, and mechanical function of internal combustion engines including lubrication, cooling, fuel, and electrical systems, and understanding of the basic sciences relevant to such topic as internal combustion and energy conversion.

Student learning outcomes:

IVC as an Institution has adopted five Student Learning Outcomes (SLO'S). They are interconnected with each other. They will be inherent throughout this course:

1. Communication
2. Skills
3. Critical thinking Skills
4. Information Literacy
5. Global Awareness

Student with Disabilities:

Any Student with a documented disability who may need educational accommodations should notify his or her instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S program is located in building 2117, Health Sciences Building, or you may contact them at (760) 355-6312.

Student Responsibilities:

- ❖ Each student is required to comply with the schedule established by Automotive Program at Imperial Valley College. Students are required to attend class each day class is in session. If for any reason a student is absent he/she is responsible for

	<ul style="list-style-type: none"> • Safety rules for hand tools • Use hand tools safely 	questions on page 46		
Part II	<u>Chapter 4</u> <ul style="list-style-type: none"> • Power tools/equipment • Types of tools/equipment • Safety procedures for tools/equipment 	<u>Textbook Homework</u> Chapter 4 Review ASE Questions <u>Basic Tools quiz</u>	<u>Workbook</u> Power tools and equipment pages 23-30	<u>Class Demonstration</u> Basic equipment
4 th Week Part I	<u>Chapter 6- Automotive Measurement and Math</u> <ul style="list-style-type: none"> • Measuring systems • Measuring Tools • Conversion charts • ASE Certification Test Questions 	<u>Textbook</u> <u>Chapter 6</u> Review ASE questions on page 84	<u>Workbook</u> Answer pages 31-34	<u>Class Demonstration</u> <ul style="list-style-type: none"> * Shop measurements * Using rulers * Using conversion charts * Using a micrometer and calipers
5 th Week Part II	<ul style="list-style-type: none"> • Using a dial indicator • Using a temperature gauge • Using a digital multimeter <u>Chapter 7</u> <ul style="list-style-type: none"> • Service Information and work orders 	Review Chapter 6 Review Chapter 7 <u>Quiz</u>	<u>Class activity</u> Using worksheets <u>Workbook</u> Chapter 7 class activity Answer pages 335-336	<u>Class Demonstration</u> <ul style="list-style-type: none"> * Review terminology * Factory manuals * Repair Manuals * Other service information
6 th Week	<u>Chapter 9- Fasteners, gaskets, seals, and sealants</u> <ul style="list-style-type: none"> • Identify commonly used automotive fasteners • Gaskets, seals, and sealants. 	<u>Textbook</u> Chapter 9 Review ASE Questions on page 125-126	<u>Workbook</u> Chapter 9 activity answer pages 41-42	<u>Class Demonstration</u> <ul style="list-style-type: none"> * Auto-fasteners * Terminology * Locks * Cotter pin * Drill bits
7 th Week	<u>Chapter 11- Engine Fundamentals</u> <ul style="list-style-type: none"> • Four-stroke cycle • Engine Terms • Basic parts of the engine 	<u>Textbook</u> <u>Chapter 11</u> Review ASE questions pages 160-161 <u>Quiz</u>	<u>Workbook</u> Answer pages 47-50	<u>Class Demonstration</u> <ul style="list-style-type: none"> * Review the four-strokes (gasoline/diesel) * Valve timing * Firing order * Block/Crank * Crams * Timing chain
8 th Week	<u>Chapter 12- Engine Design Classifications</u> <ul style="list-style-type: none"> • Engine Classifications • Gasoline/Diesel engines • Combustion Chamber design 	<u>Textbook</u> <u>Chapter 12</u> Review ASE questions page 180	<u>Workbook</u> <u>Class open activity</u> answer pages 51-56	<u>Class Demonstration</u> <ul style="list-style-type: none"> * Types of engines * V engines * Firing order of an engine

<p>9th week Part I</p>	<p><u>Chapter 13- Engine Top End Construction</u></p> <ul style="list-style-type: none"> • Design/Construction of an engine cylinder head • Purpose of valve spring shims, rotators, steam caps, and spring shields. • Camshafts • Valve lifters 	<p><u>Textbook</u> <u>Chapter 13</u> Review ASE Questions page 198</p>	<p><u>Workbook</u> Open activity answer pages 57-62</p>	<p><u>Class Demonstration</u></p> <ul style="list-style-type: none"> *Cylinder heads *Components *Valves/seats *Valves seals *Valve springs *Valve lifters *Camshafts
<p>10th week Part II</p>	<p><u>Chapter 14- Engine bottom end construction</u></p> <ul style="list-style-type: none"> •Construction of different types of cylinder blocks •Piston construction •Piston rings •Engine bearings •Engine bottom end components •Working with bottom engine components 	<p><u>Textbook</u> <u>Chapter 14</u> Review ASE questions pages 215-216</p> <p><u>Quiz</u></p>	<p><u>Workbook</u> Class open activity Answer pages 63-68</p>	<p><u>Class Demonstration</u></p> <ul style="list-style-type: none"> *Terminology bottom end of the engine *Crank and piston assembly *Cylinder block *Blue prints *Block preparation *Types of pistons *Engine measurements *Types of rods
<p>11th Week</p>	<p><u>Chapter 15- Engine Front end Construction</u></p> <ul style="list-style-type: none"> • Function and construction of a vibration damper • Types of camshaft drives • Construction of a timing gear, chain and timing belt assembly • Working on engine front and components 	<p><u>Textbook</u> <u>Chapter 15</u> Review ASE questions pages 223-224</p>	<p><u>Workbook</u> Open activity answer pages 69-72</p>	<p><u>Class Demonstration</u></p> <ul style="list-style-type: none"> *Terminology *Top dead center bottom dead center *Bore/stroke *Engine Block *Engine Crank *Engine Displacement (Cubic inch, Cubic centimeters) *Torque/power
<p>12th Week</p>	<p><u>Chapter 16- Engine size and performance measurements</u></p> <ul style="list-style-type: none"> • Engine size • Engine compression ratio • Engine torque and horsepower ratings • Volumetric Efficiency, thermal efficiency, mechanical efficiency • Engine performance 	<p><u>Textbook</u> <u>Chapter 16</u> Review ASE questions pages 232-233</p>	<p><u>Workbook</u> Open class activity pages 73-76</p>	<p><u>Class Demonstration terminology</u></p> <ul style="list-style-type: none"> *Top dead center *Bottom dead center <p><u>Discussion</u></p> <ul style="list-style-type: none"> *Bare/Stroke engine size Four strokes

13th Week	<u>Chapter 50- Engine bottom end Service</u> <ul style="list-style-type: none"> • Cylinder service • Main bore service • Block/Head • Piston clearance • Ring gap and ring clearance • Crankshaft service • Installing a piston and rod assembly • Torque-to-yield bolts • Final assembly 	<u>Textbook</u> Chapter 50 Review ASE questions Pages 968-969 <u>Quiz</u>	<u>Workbook</u> Chapter 50 open activity Pages 263-266	<u>Class Demonstration</u> * Cylinder block service * Cleaning and honing * Piston service * Connecting Rod service * Installing Rings * Crankshaft service * Checking oil clearance
14th Week	<u>Chapter 51</u> <ul style="list-style-type: none"> • Cylinder Head Service • Valve train service • Assembly cylinder head • Camshaft service • Valve lifters • Push rod service • Rock arm assembly service • Engine top end assembly 	<u>Textbook</u> Chapter 51 Review ASE questions pages 999-1000 <u>Quiz</u>	<u>Workbook</u> Chapter 51 open activity pages 267-274	<u>Class demonstration</u> * Cylinder head problems and repair * Valves and spring valve service machine * Valve seat machine * valve spring machine
15th Week	<u>Chapter 52- Engine Front End Service and Engine Installation</u> <ul style="list-style-type: none"> • Timing chain service • "Gear" • Crankshaft front seal • Engine front cover service • Timing belt service • Complete engine assembly • Installing the engine 	<u>Textbook</u> Chapter 52 Review ASE Questions pages 1014-1015	<u>Workbook</u> Chapter 52 Open activity pages 273-276 <ul style="list-style-type: none"> • Timing chains • Timing gears • Timing belts • Complete engine assembly • Cooling systems • Lubrication systems 	<u>Class Demonstration</u> -----
16th Week	<u>General Reviews,</u>	<u>ASE Exams</u>	<u>And</u>	<u>Final Preparations</u>