

AUTO 120

ENGINE MACHINE

Syllabus

Instructor: Jose Lopez

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Semester Begins: August 19, 2013

Ends: December 7, 2013

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:

Recommended Preparation: AUT 110 or 2 years of high school in auto mechanics. Review and advanced study of internal combustion engine and service procedure in the use of automotive machine shop tools and machines for rebuilding the engine. (CSU)

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 students 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 making up any missed lecture or lab assignments. It is recommended that students call the office or leave a message at (760)355-6361 to inform the instructor that he/she is ill and/or will bring a doctor's note upon returning to class.

Make sure to:

1. Bring your textbook every section of lecture
2. Bring a notebook and pencils

Exams will consist of: Class notes, Lectures, Homework, Videos, and Class/Lab activities

3. BE ON TIME FOR CLASS
4. Participate during lecture and lab activities
5. Not late assignments or exams

Basic Rules and Shop Safety:

- ❖ No music allowed in auto shop
- ❖ No parking in front of the gate
- ❖ No work should be done without instructors permission
- ❖ No parking inside the shop during lecture time
- ❖ No long breaks (only 10 minutes per hour class)
- ❖ Students cannot leave early without instructors permission
- ❖ Each student should clean work area
- ❖ No cell phones during class
- ❖ No helpers or visitors during lab activities
- ❖ Safety glasses are required

Spring 2013 Important Dates:

• Late Registration	January 17-28
• Ticketing for parking violation starts	January 30
• Deadline to make up incomplete grade	February 25
• Financial Aid return to Title IV drop deadline	March 23
• Deadline to drop full term classes	April 7**
• Holidays	Feb. 10-11/ Feb. 20/ April 9-14
• Last week of classes including final examinations	May 7-11

Non-Discrimination/ Sexual Harassment:

All forms of harassment are contrary to basic standards of conduct between individuals are prohibited by state and federal law, as well as this policy and will not be tolerated. The district is committed to provide an academic and work environment that respects the dignity of individuals and groups. The district shall be free of sexual harassment and all forms of sexual intimidation and exploitation. Emergency number 911 for First Aid ext. 6310/0300

There will be a mid-term and final exam. Each will be worth 25% of your grade. The mid-term will have 50 questions on ASE type. The final exam will have 100 ASE type questions. Quizzes will make up 25% of your grade. The last 25% of your grade will be on projects assigned as part of the lab section of class.

<u>Percentages</u>	<u>Scores</u>	<u>Letter grades</u>
25% Completed Assignments	130-115%	A
25% Quizzes	114-99%	B
25% Mid-term exams	98-83%	C
25% Final Exam	82-67%	D
30% Class Participation	66-0%	F

Assignments and Exams:

Exams will consist of information from class lectures, reading assignments, homework, videos, and class/lab activities.

- **Assignments are due every Thursday**

Note: Time can be flexible with lectures, class assignments, lab activities, or exams.

Outline and Activities

<u>Week:</u>	<u>Automotive Suspension and Wheel alignment:</u>	<u>Homework/Exam:</u>	<u>Workbook Activities:</u>	<u>Lab Activity:</u>
1 st week	<ul style="list-style-type: none"> • Course intro. , orientation, safety shop-procedures • Tools/Equipment • Videos and shop demonstrations 	Need to purchase textbooks <i>Safety shop exam</i>		
2 nd week	<u>Chapter 1- The automobile</u> <ul style="list-style-type: none"> • Parts, Assemblies, and systems • Hybrid vehicle 	<u>Textbook</u> Chapter 1- Review the main components and systems of the automobile. Pages 1-20	Use your <i>Workbooks</i> and identify the following parts, assembling and systems Pages 9,10, 11,12,13, &14	<u>Instructor</u> Show student a part component assembly, and system (out of a vehicle)
3 rd week Part I	<u>Chapter 3</u> <ul style="list-style-type: none"> • Basic hand tools • Identify common hand tools 	<u>Textbook Homework</u> Chapter 3 Review ASE	<u>Workbook</u> Basic Tools Chapter 3 Pages 19-22	<u>Class Demonstration:</u> Basic tools

	<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 <i>Basic tool quiz</i>	<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 Chapter 6</u> Review ASE questions on page 84	<u>Workbook</u> Answer pages 31-34	<u>Class Demonstration</u> *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 Info. and work orders 	Review Chapter 6 Review Chapter 7 <i>Quiz</i>	<u>Class activity</u> Using worksheets <u>Workbook</u> Chapter 7 class activity Answer pages 335-336	<u>Class Demonstration</u> *Review terminology *Factory manuals *Repair manuals *Other service info.
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> *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 Chapter 11</u> Review ASE questions pages 160-161 <i>Quiz</i>	<u>Workbook</u> Answer pages 47-50	<u>Class Demonstration</u> *Review the four-strokes (gasoline/ diesel) *Valve timing *Firing order *Block/ Crank *Crams *Timing chain
8th week	<u>Chapter 12- Engine Design Classifications</u> <ul style="list-style-type: none"> • Engine Classifications • Gasoline/ Diesel engines • Combustion Chamber design 	<u>Textbook Chapter 12</u> Review ASE questions page 180	<u>Workbook</u> <u>Class open activity</u> Answer pages 51-56	<u>Class Demonstration</u> *Types of engines *V engines *Firing order of an engine
9 th week Part I	<u>Chapter 13- Engine Top End Construction</u> <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 	<u>Textbook Chapter 13</u> Review ASE questions page 198	<u>Workbook</u> Open activity answer pages 57-62	<u>Class Demonstration</u> *Cylinder heads *Components *Valves/ seats *Valves/ seals *Valve springs *Valve lifters *Camshafts
10 th week Part II	<u>Chapter 14- Engine bottom end construction</u> <ul style="list-style-type: none"> • Construction of different types of cylinder blocks • Piston construction • Piston rings • Engine bearings • Engine bottom 	<u>Textbook Chapter 14</u> Review ASE questions pages 215-216 <i>Quiz</i>	<u>Workbook</u> Open activity answer pages 63-68	<u>Class Demonstration</u> *Terminology bottom end of the engine *Crank and piston assembly *Cylinder block *Blue prints *Block preparation *Types of pistons

	<p>end components</p> <ul style="list-style-type: none"> Working with bottom engine components 			<p>*Engine measurements</p> <p>*Types of rods</p>
11 th week	<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 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> <p>*Terminology</p> <p>*Top dead center bottom dead center</p> <p>*Bore/ stroke</p> <p>*Engine Block</p> <p>*Engine Crank</p> <p>*Engine Displacement (Cubic inch, Cubic centimeters)</p> <p>*Torque/ power</p>
12 th week	<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 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> <p>*Top dead center</p> <p>*Bottom dead center</p> <p><u>Discussion</u></p> <p>*Bore/ Stroke engine size four strokes</p>
13 th week	<p><u>Chapter 50-Engine bottom end service</u></p> <ul style="list-style-type: none"> Cylinder service Main bore 	<p><u>Textbook Chapter 50</u> Review ASE questions</p>	<p><u>Workbook</u> Chapter 50 open activity pages 263-266</p>	<p><u>Class Demonstration</u></p> <p>*Cylinder block service</p>

	service <ul style="list-style-type: none"> • Block/ Head • Piston clearance • Ring gap and ring clearance • Crankshaft service • Installing a piston and rod assembly • Torque-to-yield bolts • Final assembly 	pages 968-969 <i>Quiz</i>		*Cleaning and honing *Piston service *Connecting Rod service *Installing Rings *Crankshaft service *Checking oil clearance
14 th 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 <i>Quiz</i>	<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
15 th 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 	<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>

	assembly <ul style="list-style-type: none">• Installing the engine			
16 th week	<u>General Reviews</u>	<u>ASE Exams</u>	<u>And</u>	<u>Final Preparations</u>

Imperial Valley College 2013-2014 Academic Calendar

Fall Semester 2013

August	16 Thursday	Orientation (Service Day- All Faculty and Staff)
	19 Monday	First day of classes- Fall 2013 Semester Begins
	24 Saturday	First day of Fall 2013 Saturday Classes
September	2 Monday	Holiday (Labor Day)- Campus Closed
November	11 Monday	Holiday (Veterans Day)-Campus Closed
	28-30 Thursday-Saturday	Holiday (Thanksgiving)- Campus Closed
December	2-7 Saturday-Friday	Final Exams
	9-13 Monday-Friday	No Classes- Campus Open
	16-31 Monday-Friday	Winter Recess-Campus Closed

Spring Semester 2014

January	1-3 Wednesday-Friday	Winter Recess-Campus Closed
	6-17 Monday-Friday	No Classes-Campus Closed
	20 Monday	Holiday (Martin Luther King's Birthday)- Campus Closed
	21 Tuesday	First day of classes- Spring 2014 Semester Begins
February	14-15 Friday-Saturday	Holiday (Abraham Lincoln's Birthday)- Campus Closed
	17 Monday	Holiday (President's Day)-Campus Closed
April	21-26 Monday-Saturday	Spring Recess-Campus Closed
May	10-16 Saturday-Friday	Final Exams- Spring Semester 2014
	17 Saturday	Commencement
	26 Monday	Holiday (Memorial Day)- Campus Closed

Summer Session 2014*

May	16 Monday	Summer Session 2014 Begins
July	4 Friday	Holiday (Independence Day)-Campus Closed
	21-23 Monday-Wednesday	Final Exams- Summer Session 2014
	23 Wednesday	Summer Session 2014 Ends