Imperial Valley College Syllabus-Automotive Suspension & Wheel Alignment AUT 155

Basic Course Information

Semester	Spring 2015	Instructor's Name	Jose Lopez
Course Title & #	AUT 155	Instructor's Email	Jose.lopez@imperial.edu
CRN #	20014	Webpage (Optional)	
Room	1100	Office	1102
Class Dates	Feb 17, 2015- June 12 , 2015	Office Hours	None
Class Days/Times	M-8:35a.m- 11:45a.m T-R-8:35a.m- 10:00am	Office Phone #	760-355-6361
Units	4 Units	Who Students Should Contact If Emergency Or Other Absence	Instructor: 760-355-6362

Course Description

This course covers the principles and construction of passenger vehicle and light truck steering, chassis, and suspension system. Emphasis is placed on the skill required in the diagnosis repair and adjustment of wheel alignment including two and four wheel alignment angles. Complete suspension and overhaul will be done in laboratory activities, as well as alignment using either two or four wheel sensors. Upon successful completion of this course, students are prepared to take the Automotive Service Excellence (ASE) certification examination in steering wheel suspension. (CSU)

Student Learning Outcomes

IVC as an institution has adopted five students 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

Course Objectives

Upon successful completion of this course, students will be able to:

1. To prepare graduates for employment as automotive mechanics, parts and supply house technicians, and service station mechanics and operator. The training program is intended to meet the entry level skill needs in the occupational field of Automotive Technology (mechanics).

A. Comply with all safety shop procedures associated with suspension/steering equipment.
B. Have a good understanding of the suspension/steering system and their elements.
C. Describe the functions of the suspension/steering terms.
D. Describe the proper steps and procedures to test and repair suspension and steering system.

Textbooks & Other Resources or Links

Modern Automotive Technology (classroom) 7th Edition

Modern Automotive Technology (workbook) 7th Edition

By James E. Duffy ISBN

978-1-59070-957-3

Course Requirements and Instructional Methods

Lectures, textbook/workbook, assignments, worksheets, video guide, internet information, live demonstrations, quizzes, mid-term and final tests

. Out of class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

Course Grading Based on Course Objectives

Required Information—discretionary language
This section is where faculty would list their grading practices and grading scale, including point values and totals. Consider adding final grade calculation, rubrics, late assignments, and other grading practices.

Attendance

Required language

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See General Catalog for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

Classroom Etiquette

Required Information --Discretionary language
This is where an instructor explains his/her policy on these matters. Here is some suggested language:

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor. **Consider:** specifics for your class/program
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the General Catalog.
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

Academic Honesty

Required Language

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to 'cite a source' correctly, you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

  Anyone caught cheating or will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General School Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

Additional Help – Discretionary Section and Language

The instructor can add the information pertinent to his or her class here. Some suggested language:

- Blackboard support center: http://bbcrm.edusupportcenter.com/ics/support/default.asp?deptID=8543
- Learning Labs: There are several 'labs' on campus to assist you through the use of computers, tutors, or a combination. Please consult your college map for the Math Lab,

Reading & Writing Lab, and Study Skills Center (library). Please speak to the instructor about labs unique to your specific program.

- Library Services: There is more to our library than just books. You have access to tutors in the Study Skills Center, study rooms for small groups, and online access to a wealth of resources.

Disabled Student Programs and Services (DSPS)

Required Language: Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313, if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Required Language: Students have counseling and health services available, provided by the pre-paid Student Health Fee. We now also have a fulltime mental health counselor. For information see http://www.imperial.edu/students/student-health-center/. The IVC Student Health Center is located in the Health Science building in Room 2109, telephone 760-355-6310.

Student Rights and Responsibilities

Required Language: Students have the right to experience a positive learning environment and due process. For further information regarding student rights and responsibilities, please refer to the IVC General Catalog available online at http://www.imperial.edu/index.php?option=com_docman&task=doc_download&gid=4516&Itemid=762

Information Literacy

Required Language: Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. Students can access tutorials at http://www.imperial.edu/courses-and-programs/divisions/arts-and-letters/library-department/info-lit-tutorials/

Anticipated Class Schedule / Calendar

Required Information –Discretionary Language and Formatting: The instructor will provide a tentative, provisional overview of the readings, assignments, tests, or other activities for the duration of the course. The faculty may find a table format useful for this purpose.

Holidays

April	Monday 6th – Saturday 11th	Easter Vacation
May	Monday 25th	Columbus Day

Basic Rulers and Shop Safety:

- No music allowed in the 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 (should be 10 minutes per hour class)
- Each student should clean the work area
- The student cannot leave early without instructors permission
- No cell phones during class session
- No helpers or visitors during lab activities
- Safety glasses are required

Week:	**Automotive Suspension and Wheel alignment:**	**Homework/ Exam:**	**Workbook Activities:**	**Quiz:**	**Lab Activity:**
1st week	▪ Course introduction, orientation, safety shop-procedures ▪ Tools/Equipment ▪ Videos and shop demonstrations	Need to purchase textbooks		Safety shop exam	
2nd week	Chapter 1 The automobile ▪ Parts, Assemblies, and systems ▪ Hybrid vehicle	Textbook Chapter 1 – Review the main components and systems of the automobile. Pages 1-20	Open activity Use your Workbooks and identify the following parts, assembling and systems Pages 9. 10, 11, 12, 13 14		Instructor Show student a part component assembly, and system (out of a vehicle)
3rd week Part I	Chapter 3 ▪ Basic hand tools ▪ Identify common hand-tools ▪ Safety rules for hand tools ▪ Use hand tools safely	Textbook Homework Chapter 3 Review ASE questions on page 46	Open activity Workbook Basic Tools Chapter 3 Pages 19-22		Demonstration Basic tools
Part II	Chapter 4 ▪ Power tools/equipment ▪ Types of tools/equipment	Textbook Homework Chapter 4 Review ASE Questions	Open Activity Workbook Power tools and equipment pages 23-30	Quiz on Basic tools	Demonstration Basic equipment

	▪ Safety procedures for tools/equipment				
4th Week Part I	Chapter 65 Tire, wheel, and wheel bearing fundamentals ▪ Identify the parts of a tire and wheel ▪ Tire and wheel sizes ▪ Tire Rating Hub and Wheel bearing assemblies	Textbook Chapter 65 Review ASE questions on page 1255	Open Activity Workbook Answer pages 331-336		Demonstration Tires, wheel hubs and wheel bearing assembly
Part II	Chapter 66 ▪ Tire, wheel and wheel bearing problems ▪ Tire inflation and rotation procedures ▪ Static/dynamic wheel balance ▪ Service procedures for wheel bearings ▪ Safe-practices while servicing tires/wheels.	Textbook Chapter 66 Review ASE Questions on page 1275	Open activity Workbook Answer pages 337 340		Demonstration Tire/wheel run out Wheel/tire balance Tire machine
5th	Chapter 67	Exam	Open activity		Demonstration

week	Suspension system fundamentals ▪ Major parts of a suspension ▪ Function of each part ▪ Operation of the four common types of springs ▪ Various types of suspension ▪ Automatic Suspension leveling systems	chapters 65-66 Textbook Chapter 67 Homework review questions on page 1300	Workbook Answer page 341-344		Suspension parts
6th week	Chapter 68 Suspension system Diagnosis and repair ▪ Diagnosis problems ▪ Replace shock absorbers and ball ▪ The removal and Replacement of springs ▪ Service a strut assembly ▪ Replace control aim bushings	Textbook Chapter 68 Review ASE questions pages 1321, 1322	Open activity Workbook Answer for pages 345-348		Demonstration and worksheets ▪ Diagnosis Dry test ▪ Shock absorbers ▪ Coil Springs ▪ Struts ▪ Control Arm bushings ▪ Wheel bearings
7th week	Chapter 69 Steering System	Mid Term Exam Chapters 65, 66,	Workbook Answers for		Demonstration and Worksheets

	Fundamentals ▪ Major parts of a steering system ▪ Operation principles of steering system. ▪ Difference between linkage steering and a rack-and pinion steering system ▪ Describe the operation of hydraulic and electric assist power steering systems.	67, and 68 Textbook Chapter 69 Review ASE questions pages 1345-1346	pages 349-352		▪ Steering ▪ Linkages ▪ Rack-and pinion ▪ Power-steering ▪ tools
8th week part I **9th week part II**	Chapter 70 Steering System Diagnosis and repair ▪ Describe common steering system problems ▪ Inspect and determine the condition of a steering system ▪ Basic steering column repair OPERATIONS	Textbook Chapter 70 Review ASE questions pages 1364-1365	Workbook Open activity answers for pages 353-356		Demonstration "Quiz" Worksheets ▪ Inspection Steering ▪ Rack-and pinion ▪ Power steering pump service

	▪ Describe service and repair procedures for a rack-and pinion steering gear ▪ Service power steering belts, hoses and fluid.				
10th week part I **11th week part II**	<u>Chapter 74</u> <u>Wheel alignment</u> ▪ Principle of wheel alignment ▪ List the purpose of each wheel alignment setting ▪ Pre-alignment inspection ▪ Describe caster, camber, and toe adjustment. ▪ Explain toe-out on turns, steering axis inclination an tracking ▪ Describe the use of different types of wheel alignment equipment	<u>Textbook</u> <u>Chapter 74</u> homework Review ASE Questions pages 1463-1464	<u>Workbook</u> <u>Chapter 74</u> Open activity provide answers for pages	<u>Quiz</u> on chapter 74	<u>Demonstration and worksheets</u> ▪ Pre-alignment inspection ▪ Wheel dynamic balance ▪ Wheel bearing ▪ Suspension system inspection ▪ Steering system inspection ▪ Measuring: camber, vaster, toe in (four wheel alignment)

12th week	Chapter 64 Transaxle and Front drive axle diagnosis and repair ▪ Diagnose common transaxle and drive axle problems ▪ Remove and install	Textbook Homework Chapter 64 Review ASE questions pages 1234-1235	Workbook Open activity Answer pages 327-330		Demonstration Worksheets ▪ Remove drive shaft ▪ Universal Joint service ▪ CV-Joint service

	a transaxle assembly ▪ Replace CV-Joints on front drive axles.				
13th week	Chapter 6 Automotive measurement and math ▪ Measuring systems ▪ Measuring tools ▪ Other measurements ▪ Using basic mathematics ▪ Workplace skills	Textbook Homework Chapter 6 Review ASE questions page 84	Workbook Open activity answer pages 31-34		Demonstrations Worksheets ▪ Shop measurement ▪ Using ruler ▪ Using conversion charts ▪ Using a micrometer and caliper ▪ Using a dial indicator ▪ Using a temperature ▪ Using a digital multimeter
14th week	Chapter 80 Career success ▪ Traits of desirable employees ▪ Earnings	Textbook Homework Chapter 80 Review ASE questions pages 1562-1563	Workbook Chapter 80 open activity answer pages 401-402		Discussion Types of careers

	▪ Types of shops ▪ Getting a job as an automobile technician				
15th week	<u>Preparation</u> for Automotive Service (ASE) exams Consists of: Multiple choice questions. ▪ Most-likely-type questions ▪ Except-type questions ▪ Least-likely-type questions		<u>Activities</u> with ASE booklets: ▪ Suspension ▪ Steering ▪ Power Steering		
16th week	<u>FINAL EXAM</u>				