Imperial Valley College

Spring Semester 2013
Suspension and Wheel Alignment
AUT 155, Code # 20804 - Course Syllabus

Instructor:	**Ronnie Garrie**
Office #:	**1102A**
Phone Home:	**(760) 355-2644, (4:00PM to 8:00PM)**
Phone Days:	**(760) 339-9442 (Monday through Thursday, 7:00AM to 3:30PM)**
Cell Phone:	**(760) 275-3897**
E-mail Address:	**rgarrie@iid.com**
Class Starts:	**01/15/13 Tuesday, Lecture and Laboratory**
Class Ends:	**05/09/13 Thursday, Lecture (Final Exam End of Class)**

Class Meetings:

Days	*Type*	*Time*	*Room*
Tuesday	**Lecture and Laboratory**	**06:30PM–09:40PM**	**1100-1102**
Thursday	**Lecture and Laboratory**	**06:30PM-09:40PM**	**1400-1402**

Credit Units: **4.00 Units**

Course Description: **AU T 155 – Suspension & Wheel Alignment**
Recommended preparation: MATH 070 or MATH 071 or equivalent and AU T 125 (Automotive Brakes). This course covers the principles and construction of passenger vehicle and light truck steering, chassis, and suspension systems. 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, and suspension. (CSU)

Student Learning Outcomes - Class Goals and Objectives:

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

1. **Communication**
2. **Skills**
3. **Critical thinking skills**
4. **Information literacy**
5. **Global awareness**

The class will follow a performance-based curriculum that presents every student with the knowledge tools that will instill the skills to excel in suspension and wheel alignment automotive repair as well as a responsible member of the community.

Student Learning Outcome Objectives:

- **Inspect automotive suspension and wheel alignment systems and satisfactory list any deficiencies.**
- **Verbally and in writing effectively communicate the deficiencies to the customer.**
- **Overhaul automotive suspension and wheel alignment systems, using approved tools, and processes to produce timely and error free repairs and adjustments.**
- **Work/study cooperatively and contribute/assist fellow students in class learning.**
- **Communicate and demonstrate global awareness and responsibility.**

Measurable Course Objectives - Students Will Be Able To:

1. **Demonstrate safe job practices.**
    - **Describe general safety rules for the auto shop.**
    - **Shop machines.**
    - **Hoists, jacks, lifts, and safety standards.**
    - **Battery charging and electrical equipment.**
    - **Eye and hand protection, clothing, breathing protection.**
    - **Fire and electrical emergencies.**
    - **Location and multi-class fire extinguishers.**
    - **Location of emergency items.**
    - **Safety shop color codes.**
    - **Compressed air, hand tools, air rules, and environmental safety.**

2. **Demonstrate how to perform automotive suspension and wheel alignment maintenance and repairs.**
    - **Explain the safety considerations and vehicle stability factors involved when repairing, aligning, automotive suspension and alignment of wheels.**
    - **Describe different suspension systems and how the components function.**
    - **Suspension system electrical system service and repair.**
    - **Give steps in performing suspension repair and performing a wheel alignment.**
    - **Solve the suspension and wheel alignment troubleshooting problems.**
    - **Give examples of different suspension and wheel alignment service operations.**
    - **Use suspension repair tools and perform complete wheel alignments on the wheel alignment machine.**
    - **Balance wheel assemblies.**
    - **Receive a work order from a customer and document the customers concerns and complaints.**
    - **Inspect a vehicle and write-out a suspension and wheel alignment inspection worksheet and verbally relay the information to a customer.**
    - **Recommend in writing, after the inspection, to the customer the necessary repairs to their vehicle.**

3. **Demonstrate how to use basic hand tools.**
    - **Common measuring tools.**
    - **Hand and air wrenches/hammers.**
    - **Coil spring compressors, brake pliers, screwdrivers, and hammer.**
    - **Lubrication tools.**
    - **Battery and charging system tools.**
    - **Brake measurement tools.**
    - **Suspension and wheel alignment electronic tools.**
    - **Electrical circuit tools.**

4. **Methods of evaluation to determine if objectives have been met by student/exam and grading procedures:**
    - **There will be a mid-term and final exam. Each will be worth 25% of the student's final grade. The mid-term will have 50 questions. The final exam will have 100 questions.**
    - **There will be a student formal verbal class presentation due by the 8th week of this course, given before the lecture session is completed. The presentation will be delivered on a part of the subject material of this course. The length will be 15 to 20 minutes long.**

- **There will be homework tests each week on the chapters that have been assigned. The presentation and the homework tests will be worth 25% of the student's grade. The remaining 25% of the student's grade will be based on the student's performance on the students' laboratory projects and worksheets.**
- **All quizzes and tests must be completed and delivered to the instructor the following week they are assigned.**

Required Textbook and Workbook:

Modern Automotive Technology, Goodheart-Willcox 2009, James E. Duffy 7th Edition (Textbook).
Modern Automotive Technology, Goodheart-Willcox 2009, James E. Duffy 7th Edition (Workbook).

Class Dates and Outlines – Instruction Methodology:

Week 1: **January 15 and 17 – Class Orientation. Safety Orientation. Shop safety, battery safety, proper clothing, proper use of shop equipment, personal protective equipment, accident prevention, and hazardous materials. No homework this week but textbooks need to be purchased. Safety procedures to be followed in the shop. Shop Safety Training and test. Several subject related practical application material worksheets, handed out during the laboratory class, will be completed and handed in to the instructor at the end of the session.**

Week 2: **January 22 and 24 – Chapter 1: The Automobile. Hand in to the instructor at the beginning of the lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 9 - 14 will be completed in class and evaluated at the end of the Thursday session.**

Week 3: **January 29 and 31 – Chapters 3 - 4: Basic Hand Tools, Power Tools and Equipment. Hand in to the instructor at the beginning of the lecture class the answers to the ASE questions in the textbook at the end of the chapters. Workbook Pages 19 -30 will be completed in class and evaluated at the end of the Thursday session.**

Week 4: **February 5 and 7 – Chapters 65 - 66: Tire, Wheel, and Wheel Bearing Fundamentals, Tire, Wheel, and Wheel Bearing Service. Hand in to the instructor at the beginning of the lecture class the answers to the ASE questions in the textbook at the end of the chapters. Workbook Pages 331 - 340 will be completed in class and evaluated at the end of the Thursday session.**

Week 5: **February 12 and 14 – Chapters 6 - 7: Automotive Measurement and Math, Service Information and Work Orders. Hand in to the instructor at the beginning of the lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 31 - 36 will be completed in class and evaluated at the end of the Thursday session.**

Week 6: **February 19 and 21 – Chapter 9: Fasteners, Gaskets, Seals, and Sealants. Hand in to the instructor at the beginning of the lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 41 - 42 will be completed in class and evaluated at the end of the Thursday session.**

Week 7: **February 26 and 28 – Chapter 67: Suspension System Fundamentals. Hand in to the instructor at the beginning of the lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 341 - 344 will be completed in class and evaluated at the end of the Thursday session.**

Week 8:	**March 5 and 7 – Chapter 68 and 74: Suspension System Diagnosis and Repair. Mid-Term Test during lecture class. Class student presentation due by this week. Hand in to the instructor at the beginning of the lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 345 -348 will be completed in class and evaluated at the end of the Thursday session.**
Week 9:	**March 12 and 14 – Chapter 69: Steering System Fundamentals. Hand in to the instructor at the beginning of lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 349 – 352 will be completed in class and evaluated at the end of the Thursday session.**
Week 10:	**March 19 and 21 - Chapter 70: Steering System Diagnosis and Repair. Hand in to the instructor at the beginning of lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 353 - 356 will be completed in class and evaluated at the end of the Thursday session.**
Week 11:	**March 26 and 28 – Chapter 74: Wheel Alignment. Hand in to the instructor at the beginning of lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 377 - 380 will be completed in class and evaluated at the end of the Thursday session.**
Week 12:	**Spring Break. No classes April 1 through 6.**
Week 13:	**April 9 and 11 – Chapters 17, 18, and 19: Computer System Fundamentals, Scan Tools, and Computer Service. Hand in to the instructor at the beginning of lecture class the answers to the ASE questions in the textbook at the end of the chapters. Workbook Pages 79 - 94 will be completed in class and evaluated at the end of the Thursday session.**
Week 14:	**April 16 and 18 - Chapter 80: Career Success. Hand in to the instructor at the beginning of lecture class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages 401 - 402 will be completed in class and evaluated at the end of the Thursday session.**
Week 15:	**April 23 and 25 – Chapters 71 and 72: Brake System Fundamentals, Brake System Diagnosis and Repair, Workbook Pages 357 - 376 will be completed in class and evaluated at the end of the Thursday session.**
Week 16:	**April 30 and May 2 – Chapter 73: Anti-Lock Brakes, Traction Control, and Stability Control. Review in class all chapters in preparation for final test. Several subject related review worksheets, handed out during the laboratory class will be completed and reviewed by the class and the instructor at the end of the session. Last week to complete and hand in any class or lab assignments**
Week 17:	**May 7 and 8 – Review in Lecture Class All Chapters in preparation for final test. Final Test during the last hour of the Thursday class.**

Educational Accommodations:

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 program office is located in building 2117, Health Services Building, or you may contact them at (760) 355-6312.

Physical Conditions: **Notify the instructor if you have any physical conditions which could possibly affect your safety or health in the performance of the course laboratory assignments.**

Attendance Policy: **Four (4) tardies equal one (1) absence. Five (5) absences will require the student to be dropped and/or given an incomplete or an "F" for the course. A doctor's release may be considered an excused absence depending on the total number of classes missed. Please review 2013 Class Schedule Booklet statement on Class Attendance.**

Extra-Credit Work

None

Outside Projects

None

Work Handed in Late

Accepted with valid reason.

Class Room Management

Cell-phone/Pager use – set on silent mode and answer during break.
Class breaks – 5 minutes for each hour of class.
Participation in class – to the best of your ability.
Safety rules – as instructed in the first two meetings and then as directed during the classes. See safety rules list at the end of this syllabus.
Clean-up – clean your area of work and as directed by your instructor.
Tardiness, leaving early – report to your instructor.
Call-in because of absence – call your instructor or leave a message at the phone numbers listed at the top of this syllabus.

Harassment Statement

All forms of harassment are contrary to basic standards of conduct between individuals and are prohibited by state and federal law, as well as the District's policy, and will not be tolerated. The District is committed to providing 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.

Grading System: **Letter-Grade only.**

Percent of Overall Grade.

A. **25% Completed Lab Assignments (hand in all of the assignments -100 points)**
B. **25% Completed Weekly Homework Tests and Class Presentation (hand in all assignments - 100 points)**
C. **25% Midterm Exam (Answer all 50 questions right – 100 points)**
D. **25% Final Exam (Answer all 100 questions right – 100 points)**

A+B+C+D divided by 4 = Average Points (0 to 100)

Letter Grades.
Points Scores = Letter Grade

90 - 100 = A - Superior
80 - 89 = B - Better Than Average
70 - 79 = C - Average
60 - 69 = D - Below Average
Below 60 = F - Failing

Required Materials:

Pen and pencils.
Lined 8"x 11-1/2" standard writing paper.
Textbook.
Proper clothing suitable for shop environment (long pants, leather shoes, safety glasses, gloves, and means to secure long hair).

Student Responsibilities:

Each student is required to comply with the schedule established by the 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 or she is responsible for making up any missed literature or lab assignments. It is recommended that the students call or leave a message to inform the instructor if he or she is ill and/or bring a doctor's note upon returning to class.

- **You must bring your textbook to every class meeting.**
- **You must bring notebook and pencils to be prepared for taking class notes on class lectures, homework, videos, and class lab activities.**
- **You must be on time for each class.**
- **You must participate during lecture and lab assignments.**
- **You must hand your assignments in on time and take your exams on time.**

Safety Rules and Regulations (Code of Safe Practices):

(1) Safety glasses must be worn in designated shop areas at all times.
(2) No work shall be done in the shop or computer lab except during designated class time.
(3) Face masks, face shields, and/or goggles may need to be worn when operating power tools, equipment or machinery, which exposes the student to particulate matter.
(4) Wear proper the clothing, this is a working shop atmosphere.
  (a) Do not wear loose fitting clothing, or unsecured long hair, or articles that may be caught in moving machinery, equipment, or power tools.
  (b) Substantial and appropriate all leather shoes shall be worn in the lab area. No open toed footwear. It is recommended that boot-type footwear be worn in the shop area.
  (c) Wear long pants, gloves when necessary, and a means to secure long hair when required.
(5) All power equipment shall be shut off when not in use.
(6) Do not leave power equipment or machinery unattended when on.
(7) Do not use tools, equipment, or machinery you have not been instructed on how to use.
(8) Use the proper tool for the job at hand.
(9) When operating the equipment with another student, make sure it is understood which student is the operator.
(10) Observe rules concerning operator's safety zones.
(11) Do not hold a conversation with someone operating power tools, equipment or machinery. The distraction may cause an accident.
(12) Never operate power tools, equipment or machinery without the proper safety guards in place.
(13) When using air, be sure that no one will be the target of the air blast.
(14) Unsafe work practices or safety hazards are to be reported to your instructor.
(15) Any accident or injury, regardless of how minor, must be reported to your instructor immediately.
(16) No horseplay, running, scuffling, etc. on the college facilities.
(17) No music allowed in the auto shop.
(18) No parking in front of the gate.

(19) No work should be done without instructor's permission. No parking inside the shop during lecture time.
(20) Each student will be responsible for keeping the work area clean.
(21) Students cannot leave early without instructor's permission.
(22) No helpers or visitors during lab activities.

Fall 2013 Important Dates:

• **Late registration**	**Jan. 14 - 26**
• **Ticketing for parking violation starts**	**Jan. 28.**
• **Deadline to make up for incomplete grade**	**Feb. 22.**
• **Financial aid return to title IV drop deadline**	**March 21.**
• **Deadline to drop full-term classes**	**April 13.**
• **Holidays (for this class) – None. Spring Recess**	**April 1 – 6.**
• **Last week of classes including final examinations**	**May 6 to 10.**

Policy on plagiarism and cheating:

Cheating includes, but is not limited to:

- **Use of any unauthorized assistance in taking quizzes, tests, assessment tests, or examinations.**
- **Dependence upon the aid of sources beyond those authorized by the faculty member in writing papers, preparing reports, solving problems or carrying out other assignments.**
- **The acquisition, without permission, of tests or other academic material belonging to a member of the college faculty or staff.**

Plagiarism includes, but is not limited to:

- **The use of paraphrased or directly quoted published or unpublished work of another person without full and clear acknowledgment.**
- **The unacknowledged use of material prepared by another person or agency engaged in the selling of term papers or other academic materials.**
- **Information gathered from the internet and not properly identified is also considered plagiarism.**

Such academic misconduct may be subject to sanctions which may include a warning, grade adjustment, or course failure.