Basic Course Information

Semester	**Spring 2017**	Instructor Name	**Alan "Moose" Butler**
Course Title & #	**AU T 170 Engine Diagnosis and Repair**	Email	**alan.butler@imperial.edu**
CRN #	**20856**	Webpage	**Full Time: Office 1104**
Room	**1100-1102 and 1103**	Office Hours	**2:00 PM to 5:00 PM M - Th**
Class Dates	**February 14 through June 8**	Office Phone #	**(760) 355-6507**
Class Days	**Tuesday & Thursday**	Cell Phone #	**(619) 200-6034**
Class Times Units	**6:00PM – 9:10PM, Tuesday** **6:00PM – 8:05PM, Thursday** **3 Units**	Contact if student will be out or has emergency	**Contact me by cell phone or E-mail.**

Course Description

This course provides advanced operation and hands-on experience of electronic injection system and their sub-assemblies. Students will learn operation and repairs of sensors and actuators or injection systems. This class emphasizes diagnostic procedures and techniques using basic and sophisticated test equipment.

Student Learning Outcomes

Upon course completion, with a grade of "C" or better, the successful student will have acquired new skills, knowledge, and/or attitudes as demonstrated by being able to:

1. Research applicable vehicle and service information such as the engine management system operation, vehicle service history, service precautions, and service technical bulletins. ILO1, ILO2, ILO3
2. Locate and interpret vehicle and major component identification numbers. ILO1, ILO2, ILO3
3. Check for module communication, including CAN/BUS systems, errors using a scan tool. ILO1, ILO2, ILO3

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 Skills
2. Critical Thinking Skills
3. Personal Responsibility
4. Information Literacy
5. Global Awareness

Student Learning Outcome Objectives:

- Learn about the automotive computer and its functions in relationship to electric fuel injection.
- Learn about sensors, actuators, and test procedures that control the engine operation.

- Learn throttle body, port fuel injection, mechanical and electronic fuel injection systems, how they operate and how to diagnose each system.
- Learn about turbocharger and supercharger systems.
- Understand theory and troubleshoot operation of exhaust gas recirculation, crankcase ventilation, air injection, catalytic converters and related components.
- Learn theory and operation of electronic spark timing. The student will learn how to check timing, adjust, and repair.
- Communicate and demonstrate global awareness and responsibility.

The class will follow a performance-based curriculum that presents every student with the knowledge tools that will instill the skills to excel in Engine Diagnosis and Repair as well as a responsible member of the community.

Course Objectives

Upon course completion, with a grade of "C" or better, the successful student will have acquired new skills, knowledge, and/or attitudes as demonstrated by being able to:

Measurable Course Objectives - Students Will Be Able To:

1. Demonstrate safe job practices.
    - Describe general safety rules for the auto shop.
    - Engines and shop machines.
    - Hoists, jacks, lifts, and safety standards.
    - Battery charging and electrical equipment.
    - Eye 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 use jumper cables with caution.
    - Battery and cable inspection.
    - Battery connections and post terminals.
    - Battery charging and battery rates.
    - Battery cables and terminal identification.
    - Selection of the correct battery size.
    - Selection of the correct cable size.
    - Review/safety procedures how to use battery jumper cables.

3. Demonstrate how to perform vehicle maintenance and repairs.

- Diagnose and research drivability problems and error codes with the modern automobile.
- Receive a work order from a customer and document the customer's concerns and complaints.
- Recommend in writing, after a vehicle inspection, to the customer the necessary repairs to their vehicle.
- Engine cooling system service and repair.
- Engine lubrication system service and repair.
- Exhaust system service and repair.
- Fuel, fuel injection system service and repair.
- Ignition system service and repair.
- Charging system services and repair.

4. Demonstrate how to use basic hand tools.
   - Hand and air wrenches.
   - Pliers, screwdrivers, and hammer.
   - Engine and chassis lubrication tools.
   - Battery and charging system tools.
   - Under the vehicle tools – exhaust system tools.
   - Tire, wheel, hub, and brake tools.
   - Electrical circuit tools.
   - Common measuring tools.

Methods of evaluation to determine if objectives have been met by student/exam and grading procedures:

- There will be a written 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 written homework tests 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 completed worksheets.
- All homework quizzes and tests must be completed and delivered to the instructor the following week they are assigned.

Textbooks & Other Resources

1. Modern Automotive Technology, James E. Duffy 8th Edition (Textbook). ISBN number:
2. Modern Automotive Technology, James E. Duffy 8th Edition (Workbook). ISBN number:

Required Materials:

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

Course Requirements and Instructional Methods

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.

Course Grading Based on Course Objectives

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

Extra-Credit Work

None

Outside Projects

None

Work Handed in Late

Accepted with valid reason.

Attendance

- 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. Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.
- 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 2016 Class Schedule Booklet statement on Class Attendance.
- 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.

Classroom Etiquette and Classroom/Laboratory Safety

- Electronic Devices: Cell-phone and electronic devices – set on silent mode and answer during break.
- 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.
- Visiters and children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.
- 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 by staff during the classes.

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.
(23) Clean-up – clean your area of work and as directed by your instructor.

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.

Academic Honesty

- 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

- Blackboard: Check for special announcements and additional instructional materials and videos.
- You may consult your college map for the Math Lab, Reading & Writing Lab, and Study Skills Center (library).
- Library Services: As you know 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)

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.

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 class/laboratory assignments. Adjustments to your assignments, if necessary, will be made.

Student Counseling and Health Services

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

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.

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 its sexual intimidation and exploitation. If someone says or does anything to you or someone else that makes you feel uncomfortable or that you feel is inappropriate contact your instructor immediately.

Information Literacy

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 and Important IVC Dates

Spring 2016 Important Dates:

• Late registration	Feb.13-25
• Deadline to drop full-term classes without owing fees.	Feb.26
• Ticketing for parking violation starts	Feb.27
• Deadline to make up for incomplete grade	Mar.24
• Financial aid return to title IV drop deadline	Apri/27
• Deadline to drop full-term classes	May13
• Holidays/Spring Recess	April 17 - 22
• Last week of classes including final examinations	June 5-9

Class Dates and Outlines – Instruction Methodology:

Week 1: 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 is due but textbooks need to be purchased. Students will be instructed on safety procedures to be followed in the shop. There will be shop safety training and written test. Several subject related practical application material worksheets may be handed out during the laboratory class, to be completed and handed in to the instructor as assigned.

Week 2: 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 will be completed in class and evaluated at the end of the Thursday session.

Week 3:	Chapter 11: Engine 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 chapters. Workbook Pages will be completed in class and evaluated at the end of the Thursday session.
Week 4:	Chapter 41: Gasoline Injection 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 will be completed in class and evaluated at the end of the Thursday session.
Week 5:	Chapter 17: Electrical Principles. 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 will be completed in class and evaluated at the end of the Thursday session.
Week 6:	Chapter 24: On-Board Diagnostics and Scan Tools. 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 will be completed in class and evaluated at the end of the Thursday session.
Week 7:	Chapter 25: Computer System 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 chapter. Workbook will be completed in class and evaluated at the end of the Thursday session.
Week 8:	Chapter 20: Electrical Tools and Test Equipment. 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 will be completed in class and evaluated at the end of the Thursday session.
Week 9:	Chapter 21: Wiring Diagrams and Wiring Repairs. 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 will be completed in class and evaluated at the end of the Thursday session.
Week 10:	April 17 – 22 **SPRING BREAK**
Week 11	Chapter 51: Emission Control System Technology. 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 will be completed in class and evaluated at the end of the Thursday session.

Week 12:	May 3 and 5– Chapter 53: Engine Performance and Driveability. 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 will be completed in class and evaluated at the end of the Thursday session.
Week 13:	May 10 and 12 – Chapter 34: Ignition System Technology. 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 will be completed in class and evaluated at the end of the Thursday session.
Week 14:	May 17 and 19– Chapter 30: Engine Starting Systems. Hand in to the instructor at the beginning of lab class the answers to the ASE questions in the textbook at the end of the chapter. Workbook Pages will be completed in class and evaluated at the end of the Thursday session.
Week 15:	May 24 and 26 – Chapter 32: Charging System Technology. 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 will be completed in class and evaluated at the end of the Thursday session.
Week 16:	May 31 and June 2 - Chapter 66: Automatic Transmission Technology. 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 will be completed in class and evaluated at the end of the Thursday session.
Week 17:	June 7 and 9– Review in Lecture Class All Chapters in preparation for final test. Last week to complete and hand in any class or lab assignments. Final Test during the last hour of the Thursday class.