Basic Course Information

Semester:	**Spring 2018**	Instructor Name:	**Alan "Moose" Butler**
Course Title & #:	**Emission Control & Computer Systems AUT-230**	Email:	**alan.butler@imperial.edu**
Classroom:	**1101**	Office #:	**1104**
Class Days:	**Tuesday and Thursday**	Office Phone #:	**760-355-6507**
Class Times:	**T-6:00-9:10 pm Th-6:00-8:05 pm**	Emergency Contact:	**619-200-6034 cell**
Units:	**3**		

Course Description

This is an advanced engine computer and drivability course. It emphasizes diagnostic procedure and techniques using all types of equipment and procedures. This class brings together all knowledge from AUT 160, and AUT170, and allows the students to diagnose all systems of the automobile. Upon successful completion of this course students are prepared to take the Automotive Service Excellence (ASE) certification examination in electronics, engine performance, and advance engine performance.

Student Learning Outcomes

1. Diagnose the causes of emissions or driveability concerns with store or active diagnostic trouble codes; obtain graph, and interpret scan tool data.
2. Access and use service information to perform step-by-step diagnosis.
3. Inspect and test ignition primary and secondary circuit wiring and solid state components; perform necessary action.

Course Objectives

1. Learn the proper safety practices of tools and equipment; learn hazardous waste policies and procedures, and learn about the air bag systems.
2. Learn about equipment used to obtain proper repair procedures using a service bulletins, computer system manuals, as well as the proper tools for each diagnosis.
3. Learn about the meters used for testing electrical circuits; learn the proper procedure for testing batteries, starters, alternators, voltage drops, and electrical drains.
4. Learn and diagnose problems with engines such as oil leaks, engine noises, overheating, compression, and vacuum problems; will also learn the proper diagnostic procedure along with the use of the proper equipment and tools.
5. Learn how to diagnose the 'no-start condition' caused by ignition systems; test and replace different components of an ignition system in the primary and secondary circuits with the aid of diagnostic equipment.

6. Learn to diagnose fuel problems that cause the 'no start condition' and drivability; will also learn the procedure for testing components for fuel systems.
7. Learn the proper methods of testing for problems in intake and exhaust systems; will learn to use a vacuum gauge, back pressure gauge, four gas analyzer, and be able to take temperature readings for the system.
8. Learn how to use four and five gas analyzers to perform emission control diagnosis; will learn how to diagnose different component in an emission system along with the use of different types of diagnostic equipment.
9. Learn how to pull up engine codes and perform scan tool operation using an engine computer, will also learn how to test engine control sensors.
10. Learn to perform a fuel pressure test, clean and replace injectors, diagnose idle problems, and learn how to perform a leakage test on a fuel injection system.
11. Learn to perform the necessary test to repair electronic carburetor controls.
12. Learn how to diagnose the 'no-start condition' on distributor type ignition systems; learn to replace a distributor, set and check timing, and describe how the timing affects the vehicle operation.
13. Learn how to diagnose the 'no-start condition' on electronic-equipped engines; learn how to replace and adjust cam and crank sensors.
14. Learn how an OBD II System works; learn how to diagnose the system using a scan tool, and learn the associated terminology of an OBD II System

Textbooks & Other Resources or Links

Equipment and Supplies:

1. Textbook & Workbook: Modern Automotive Technology 8th Edition James E. Duffy
2. Pen and pencils.
3. Standard writing paper.
4. Personal Protective Equipment:
    - Safety glasses,
    - Work footwear,
    - Proper shirt and pants

Course Requirements and Instructional Methods

Method of Instruction:
Methods of instructions may include, but are not limited to, the following: lectures, textbook worksheets, hands-on worksheets, internet readings, large and small group discussions, audiovisual aids, and demonstrations.
ASSIGNMENTS:
Reading and Writing:
Write a report comparing the emissions produced by a late model automobile engines to the higher emissions produced by a two-stroke engines used in weed eaters, snow throwers, watercraft, etc. Discuss what can be done to reduce the emissions produced by these engines.
Out-of-class:
Monitor the pollution levels for your area (or a major metropolitan area) for one week and write a report. Note the relationship of pollution to the day's temperature and weather.

Course Grading Based on Course Objectives

Grading Criteria:

1. Grading system:
    - A=90%-100% of points= Excellent
    - B=80%-89% of points= Good
    - C*=70%-79% of points= Satisfactory
    - D= 60%-69% of points= Pass, less than satisfactory
    - F= Less than 60% of points= Failing
2. Very important:
    - **Mid-Term**. will be a multiple choice test
    - **Final-Exam** will be a multiple choice test
    - There are no make-up exams unless you have a very good reason and make arrangements with the instructor before the exam.
    - Final grades can be raised or lowered based on your preparation and participation in class. It benefits you to be engage and participative.

Course Grade:
The course grade is based on total points accumulated during the semester. There is a total of 500 points available. Grades are determined by dividing the total points you earn by the total points available to get your percentage. (Total points may vary if I change the assignments in a particular week). **Grading of Hands-on Assignments:**
The most common problem students experience is not being detailed enough in their answers and not spending the right amount of time in the repair procedures. Always be as specific as you can and use examples from your readings. Make sure to answer all parts of the questions. Points will be deducted for inadequate responses. Feedback will be given after each assignment and, hopefully, you will improve as you proceed with the course. The following grading rubric is used when grading assignments.

	Grading Rubric for Hands-on Assignment	Points
A	Focused and clearly organized. Contains critical thinking and content analysis. Convincing evidence is provided to support conclusions. Ideas are clearly communicated. Clearly meets or exceeds assignments requirements.	18-20
B	Generally focused and contain some development of ideas, may be simplistic or repetitive. Evidence is provided which supports conclusions. Meet assignments requirements.	16-17

C	May be somewhat unfocused, underdeveloped, or rumbling. But does have some coherence. Some evidence is provided which support conclusions. Meets minimum assignment requirements.	14-15
D	Unfocused, underdeveloped. Minimal evidence is used to support conclusion. Does not respond appropriately to the assignment.	12-13
F	Minimal effort by the student. Unfocused, underdeveloped. Evidence is not used to support conclusion. Block overall understanding. Does not meet assignment requirements.	0-11

Attendance and Class Participation

- **Class Participation Rubric**

BELOW AVERAGE	AVERAGE	ABOVE AVERAGE	Points Possible
Student misses class or leaves class early or shows up to class late. (0 Points)	Student comes to class late or leaves class early, but asks permission or provides an excuse (5-7 Points)	Student is always on time. Student only leaves class with permission after completing assignments. (8-10 Points)	All students start with 10 possible points each day. The points are documented in the grade center at the beginning of class.
Student does not participate in assigned tasks. (0 Points)	Student Participates in assigned tasks but does no take an active role or leadership role. The student tends to watch others work. (5-7 Points)	Student takes a leadership role in all assigned tasks. Student is willing to help others. (8-10 Points)	Points are finalized at the end of class. At the end of class points either will remain at 10 or be lowered.
Student Violates Safety Rules. (0 Points)	Student Does not violate safety rules but needs to be asked what he or she is doing? Student does not clean work area or needs to be told to clean up. (5-7 Points)	Student is safe and encourages others to be safe. Student cleans the shop area and encourages others to clean up. (8-10 Points)	

- 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

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- 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 by the instructor.
- 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.

Shop/ Lab Area

- Safety test must be passed to work in the shop and complete required lab exercise.
- Safety glasses are required to be worn at all times while in the shop area, safety glasses are the student responsibility (students not wearing safety glasses will be ask to leave the class for that day no exceptions).
- Clean up your area and any other lose debris or trash.
- Wear all required safety protection and comply with posted signs.
- No shorts or open toe foot wear, always be prepared to go into the lab area.
- Comply with tool check out policy and return tools clean.

- **Faculty and Staff**

All students are required to take direction from any faculty, any issues with direction should be brought up to your instructor, however all staff has the right to direct any student at any time. Please respect the staff's decisions.

Safety Requirements:

For every task performed in Automotive Electronics course the following safety requirements must be strictly enforce:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

Parking:

No student parking by the building, the only exception is on lab time if your vehicle is a project (instructor approved). Speed limit must be kept at or under 5MPH.

Parking permit is required at all times.

Projects:

All projects are to be taken with the student's unless otherwise approve by the instructor.

All approve projects must be removed from campus prior to finals.

All projects must have a written work order (R/O).

Shop Maintenance:

All work will cease 20 minutes prior to end of class.

All work areas must be cleaned.

Tools must be cleaned and returned to the tool room.

Any broken or missing tools must be reported immediately. Tools are student's responsibility

Online Netiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)].

Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property. There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- 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 plagiarizing 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 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 Student Services

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

- **Canvas Support Site.** The Canvas Support Site provides a variety of support channels available to students 24 hours per day.
- **Learning Services.** There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your Campus Map for the Math Lab; Reading, Writing & Language Labs; and the Study Skills Center.
- **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)

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. Please contact them if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee.

- **Student Health Center**. A Student Health Nurse is available on campus. In addition, Pioneers Memorial Healthcare District and El Centro Regional Center provide basic health services for students, such as first aid and care for minor illnesses. Contact the IVC Student Health Center at 760-355-6310 in Room 2109 for more information.

- **Mental Health Counseling Services**. Short-term individual, couples, family, and group therapy are provided to currently enrolled students. Contact the IVC Mental Health Counseling Services at 760-355-6196 in Room 2109 for more information.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC General Catalog.

Information Literacy

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC Library Department provides numerous Information Literacy Tutorials to assist students in this endeavor.

Anticipated Class Schedule/Calendar

Week 1: Class orientation, safety procedures, demonstrations, shop activities and safety test.
For every chapter in the course review questions and workbook must be completed and there will a quiz for every chapter.

Week 2-3: the automobile and automotive careers and certifications chapters 1-2.
Lab activity: automobile systems identification and careers and certification research.

Week 4-5: Computer control technology chapters 23-24
Lab activity: locate and interpret vehicle VIN numbers, access and use electronic service information (ESI), interpret sensors and actuators scan tool data.

Week 6-7: Automotive Fuels, exhaust, and induction system chapters 39, 41, 42.
Lab activity: prepare 4 or 5 gas analyzer; inspect and prepare vehicle for test and obtain exhaust readings; interpret readings, check fuel pressure, injector service and determined necessary action.

Week 8: MID-TERM.

Week 9-10: Ignition systems technology chapters 34, 35.
Lab activity: Ignition system diagnosis and repair.
Inspect and test ignition primary system.
Inspect and test ignition secondary system.

Week 11-12: Emission control systems technology chapters 51, 52.
Lab activity: Inspect and test computerized emissions control systems.
Inspect and test exhaust gas data, Evaporative system test, Vehicle inspection reports, drive trace reports

Week 13-14: Engine troubleshooting and performance chapters 53, 54.
Lab activity: Use a systematic approach when diagnosing engine performance problems, use scan tool data to find mechanical and electrical problems, use advance diagnostics techniques to find difficult problems.

WEEK 15: Preparation for final exam

Week 16: FINAL-EXAM

*****Tentative, subject to change without prior notice*****