

### Basic Course Information

|                   |   |                    |                                    |
|-------------------|---|--------------------|------------------------------------|
| Semester:         | <b>Spring 2018</b>                              | Instructor Name:   | <b>Ricardo Pradis</b>              |
| Course Title & #: | <b>Manual Trans. &amp; Power Trains AUT-180</b> | Email:             | <b>Ricardo.pradis@imperial.edu</b> |
| CRN #:            | <b>20938</b>                                    |                    |                                    |
| Classroom:        | <b>1100</b>                                     | Office #:          | <b>1100</b>                        |
| Class Dates:      | <b>Feb.12-June 8</b>                            | Office Hours:      | <b>M-Th 7:00-8:00am</b>            |
| Class Days:       | <b>Tuesday and Thursday</b>                     | Office Phone #:    | <b>(760) 355-6403</b>              |
| Class Times:      | <b>T-2:00-5:10pm<br/>TH-2:00-5:10pm</b>         | Emergency Contact: | <b>(760) 355-6361</b>              |
| Units:            | <b>4.0</b>                                      |                    |                                    |

### Course Description

This course discusses modern manual transmissions, driveline and differential theory of method of repair, service equipment operation and technique of problems diagnosis procedures for import and domestic vehicles. Up on successful completion of this course, students are prepared to take the Automotive Service Excellence test (ASE) certification examination in manual transmission.

### Student Learning Outcomes

1. Identify and interpret drive train concerns; determine necessary action.
2. Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine necessary action.
3. Remove and reinstall transmission/transaxle.
4. Diagnose constant-velocity (CV) joint noise and vibration concerns; determine necessary action.

### Course Objectives

1. Comply with all safety shop procedures associated with safety stands, air tools, hydraulic jacks and car lifts.
2. Identify the major components of the Automobile clutch assembly
3. Have a basic understanding of how drive-train system works
4. Learn different types of power-train units
5. Understand manual shift transaxle and overdrive
6. Understand gear ratios and planetary gear system
7. Understand the purpose of the front and rear drivelines
8. Study various import vehicles drive trains.

## 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

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.

### Out-of-class:

Library computer software assignment. Read, review and answer the Level I, Level II, and Level III ASE Questions. After completion students will print out a report to find out the level where he/she needs support.

### Reading and Writing:

Read, Review and answer Automotive Service Excellence (ASE) questions from ASE A3 class booklet, motor age. When finished, the instructor will review each statement with live transmission components. The assignment consists of: 1. Clutch diagnosis and repair-6 questions. 2. Transmission diagnosis and repair-7 questions. 3. Transaxle diagnosis and repair-7 questions. 4. Driveshaft/halfshaft and universal joint/constant velocity (CV) joint diagnosis and repair- 5 questions 5. Rear-Wheel drive axle diagnosis and repair-7 questions. 6. Four-wheel drive/all wheel drive component, Diagnosis and repair-8 questions.

## 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 (60 points) will be given on April 12. It will be a multiple choice test Bring your Scantron, and pencil.
- Final-Exam (60 points) will be given on June 7. It will be a multiple choice test Bring your Scantron and pencil.

- 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.

**Grades:**

|                                    | Points |
|------------------------------------|--------|
| Book worksheets, quizzes.          | 140    |
| Lab activity, hands-on worksheets. | 240    |
| Mid-term                           | 60     |
| Final-exam                         | 60     |
| Total points                       | 500    |

**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

- 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

### Automotive Technology Classroom & Shop Policy

- 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.
- Do not perform any work on any vehicle outside the assigned task without permission from your instructor.
- Long hair must be kept in a ponytail or tucked away for safety.

### 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 perform in Automotive Manual Trans. course the following safety requirements must be strictly enforced:

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 LMS.** Canvas is Imperial Valley College's main Learning Management System. To log onto Canvas, use this link: [Canvas Student Login](#). The [Canvas Student Guides Site](#) provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- **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.

## **Veteran's Center**

The mission of the [IVC Military and Veteran Success Center](#) is to provide a holistic approach to serving military/veteran students on three key areas: 1) Academics, 2) Health and Wellness, and 3) Camaraderie; to serve as a central hub that connects military/veteran students, as well as their families, to campus and community resources. Their goal is to ensure a seamless transition from military to civilian life. The Center is located in Building 600 (Office 624), telephone 760-355-6141.

## **Extended Opportunity Program and Services (EOPS)**

The Extended Opportunity Program and Services (EOPS) offers services such as priority registration, personal/academic counseling, tutoring, book vouchers, and community referrals to qualifying low-income students. EOPS is composed of a group of professionals ready to assist you with the resolution of both academic and personal issues. Our staff is set up to understand the problems of our culturally diverse population and strives to meet student needs that are as diverse as our student population.

Also under the umbrella of EOPS our CARE (Cooperative Agency Resources for Education) Program for single parents is specifically designed to provide support services and assist with the resolution of issues that are particular to this population. Students that are single parents receiving TANF/Cash Aid assistance may qualify for our CARE program, for additional information on CARE please contact Lourdes Mercado, 760-355- 6448, [lourdes.mercado@imperial.edu](mailto:lourdes.mercado@imperial.edu).

EOPS provides additional support and services that may identify with one of the following experiences:

- Current and former foster youth students that were in the foster care system at any point in their lives
- Students experiencing homelessness
- Formerly incarcerated students

To apply for EOPS and for additional information on EOPS services, please contact Alexis Ayala, 760-355-5713, [alexis.ayala@imperial.edu](mailto:alexis.ayala@imperial.edu).

## **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. Class introduction. Safety orientation, Class activities, using textbook, Homework, and safety test.

**WEEK 2: Chapter 1 the automobile**

- Answer review questions and workbook chapter 1.
- Lab. Activity:
- Locate & interpret vehicle and major component identification numbers (VIN, vehicle identification levels, and calibration decals).
- Complete work order.
- Research applicable vehicle and service information, such as drive train system operation, fluid type, service precautions, and technical service bulletins.

**WEEK 3: Chapters 2 & 3 Tools**

- Answer review questions chapters 2 & 3.
- Lab. Activity:
- Diagnose fluid loss, level, and condition
- Drain and fill manual transmission/transaxle and final drive unit

**WEEK 4 & 5: Chapter 64 Manual Transmissions Fundamentals**

- Answer review questions and workbook chapter 64
- Lab. Activity:
- Remove & reinstall transmission
- Disassemble transmission/transaxle

**WEEK 6: Chapter 65 Manual Transmission Diagnosis and Repair**

- Answer review questions and workbook chapter 65
- Lab. Activity:
- Clean and Inspect Transmission/Transaxle

**WEEK 7: Chapter 72 Transaxle and Front Drive Axle Fundamentals**

- Answer review questions and workbook chapter 72
- Lab. Activity
- Diagnose noise concerns, hard shifting, jumping out of gear. Inspect shift linkages, brackets, bushings, shift covers, forks, sleeves, shafts, gears, and case assembly.

**WEEK 8: Chapter 73 Transaxle and Front Drive Axle Diagnosis and Repair**

- Answer review questions and workbook chapter 73
- Lab. Activity:
- Reassemble Transmission/transaxle
- Remove and replace drive axle shaft

**WEEK 9: MID-TERM**

- Lab. Activity:
- Inspect and replace drive axle shaft seals, bearings, and retainers.

**WEEK 10: Chapter 62 Clutch Fundamentals**

- Answer review questions and workbook chapter 62
- Lab Activity:
- Inspect and replace clutch pressure plate assembly, clutch disc release bearing, and pilot bearing/bushing

**WEEK 11: Chapter 63 Clutch Diagnosis and Repair**

- Answer review questions and workbook chapter 63



- Lab. Activity:
- Bleed clutch hydraulic, inspect cables, pedal, and flywheel

**WEEK 12: Chapter 70 Differentials and Rear Drive Axles**

- Answer review questions and workbook chapter 70
- Lab. Activity:
- Disassemble, inspect, measure, and adjust a differential case assembly

**WEEK 13: Chapter 71 Differentials and Rear Drive Axles Diagnosis**

- Answer review questions and workbook chapter 71
- Lab. Activity
- Reassemble and reinstall differential case assembly

**WEEK 14: Chapter 68-69 Drive Shaft & Transfer Case**

- Answer review questions and workbook chapter 69
- Lab activity
- Identify drive shaft and transfer case components

**WEEK 15:**

- Preparation for Final Exam

**WEEK 16:**

- **FINAL-EXAM**

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