



### Basic Course Information

Semester:	<b>SPRING 2024</b>	Instructor Name:	<b>Ricardo Pradis</b>
Course Title & #:	<b>MANUAL TRANS AND POWER TRAINS AUT-180</b>	Email:	<b>ricardo.pradis@imperial.edu</b>
CRN #:	<b>20465</b>	Webpage (optional):	
Classroom:	<b>BLDG 1100</b>	Office #:	<b>1100 bldg.</b>
Class Dates:	<b>FEB. 12– JUN 7</b>	Office Hours:	<b>T-R 12:30-1:00 pm</b>
Class Days:	<b>Tuesday's &amp; Thursday's</b>	Office Phone #:	<b>760-355-6403</b>
Class Times:	<b>T 1:00-4:10 PM                      T R 1:00-4:10 PM</b>	Emergency Contact:	<b>760-355-6361 (Secretary)</b>
Units:	<b>4.0</b>	Class Format:	<b>Face to Face</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.

### Course Prerequisite(s) and/or Corequisite(s)

None

### 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

Textbook: G-W Modern Automotive Technology ISBN: 978-1-54564-688-4

## 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.

### 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** will be given on April 11.
- **Final-Exam** will be given on June 6.
- 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

**Course Policies**

- 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.

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.

### **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.

### **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.



## Other Course Information

### Work-based Learning

Career possibilities in the automotive industry:

Work-based learning (WBL) allows student to apply classroom content in professional settings while gaining real-work experiences. These opportunities will provide you with a deeper, more engaging and relevant learning environment. Some examples of WBL assignments are job shadowing, informational interviews, and guest speakers. In this course, you will be working on workplace simulations and will be using Ford Service Training online program. It is intended to provide students with simple knowledge (basic) to complex skills (advance) training.

#### **Contact:**

Office Phone: (760) 355-5721

Email: [careerservicescenter@imperial.edu](mailto:careerservicescenter@imperial.edu)

#### **Hours of Operation:**

Monday - Friday; 8:00 a.m. to 5:00 p.m.

## IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit <http://www.imperial.edu/studentresources> or click the heart icon in Canvas.

## Anticipated Class Schedule/Calendar

Date or Week	Activity, Assignment, and/or Topic	Pages/ Due Dates/Tests
Week 1 Feb. 12-15	Syllabus & Introduction, Ford service training. Chapter 5 Auto Shop Safety	Pages 55-56
Week 2 Feb. 20-23	Chapter 1 The Automobile Lab: Inspect power train main components	Pages 3-19
Week 3 Feb 26-March 1	Chapter 78 Service information and work orders Lab: Use service information (pro-on-demand), filled a R/O	Pages 78-86
Week 4 March 4-8	Chapter 61 Clutch Technology Lab: Identify clutch components	Pages 927-939
Week 5 March 11-15	Chapter 62 Clutch diagnosis, service and repair Lab: Remove and replace a clutch	Pages 940-955
Week 6-7 March 18-29	Chapter 63 Manual transmission technology Lab: Disassemble a manual transmission	Pages 956-974
Week 8-9 April 8-19	Chapter 64 Manual transmission diagnosis, and repair Lab: Inspect and assemble a manual transmission	Pages 975-983
Week 10-	MID-TERM	EXAM



IMPERIAL VALLEY COLLEGE

<b>Date or Week</b>	<b>Activity, Assignment, and/or Topic</b>	<b>Pages/ Due Dates/Tests</b>
April 22- 26		
Week 11 April 29- May 3	Chapter 68 Drive shaft and transfer case service Lab: Drive Shaft Inspection and Maintenance, Transfer Case Service	Pages 1031-1039
Week 12 May 6-10	Chapter 69 Differential and drive rear axle technology. Lab: Disassemble and identify differential components	Pages 1040-1055
Week 13 May 13-17	Chapter 70 Differential & Rear Drive Axle Service & Repair Lab: Rear Axle Service, measurements, adjustments, and Reassembly.	Pages 1056-1071
Week 14 May 20-24	Chapter 71 Transaxle & Front Drive Axle Technology Lab: Identify front drive axle components	Pages 1072-1088
Week 15 May 28-31	Chapter 72 Transaxle & Front Drive Axle Repair Lab: Front Drive Axle Removal, Service, and Installation.	Pages 1089-1102
Week 16 June 3-7	FINAL-EXAM	EXAM

**\*\*\*Subject to change without prior notice\*\*\***