

CATALOG INFORMATION

Dept and Nbr: AUTO 53 Title: AUTO POWER FLOW
Full Title: Automotive Power Flow, Transmissions & Drive Axles
Last Reviewed: 9/10/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	6.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	6.00	Lab Scheduled	7.00	17.5	Lab Scheduled	122.50
		Contact DHR	0		Contact DHR	0
		Contact Total	11.00		Contact Total	192.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00

Total Student Learning Hours: 332.50

Title 5 Category: AA Degree Applicable
Grading: Grade Only
Repeatability: 15 - 12 Units Within 4 Semesters
Also Listed As:
Formerly:

Catalog Description:
Lecture, demonstration, and practical lab experience in the study of the operation, repair, and troubleshooting of most automotive transmissions, drive axles, and transaxles. Emphasis on the proper use of tools and equipment. Formerly Auto 53 and 53L.

Prerequisites/Corequisites:

Recommended Preparation:
Auto 350 (formerly AUTO 50) & AUTO 350L (formerly AUTO 50L) or high school auto.

Limits on Enrollment:

Schedule of Classes Information:
Description: Lecture, demonstration, and practical lab experience in the study of the operation, repair, and troubleshooting of most automotive transmissions, drive axles, and transaxles. Emphasis on the proper use of tools and equipment. Formerly Auto 53 and Auto 53L. (Grade Only)
Prerequisites/Corequisites:
Recommended: Auto 350 (formerly AUTO 50) & AUTO 350L (formerly AUTO 50L) or high

school auto.

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: 12 Units Within 4 Semesters

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:
IGETC:	Transfer Area	Effective:	Inactive:
CSU Transfer:	Transferable	Effective: Fall 1981	Inactive: Spring 2019
UC Transfer:		Effective:	Inactive:

CID:

Certificate/Major Applicable:

Certificate Applicable Course

COURSE CONTENT

Outcomes and Objectives:

Students will be able to explain the operation of, perform problem diagnosis, and repair of the automotive power train components. Students should be able to pass the A.S.E. Power Train Certification examination and, enter the automotive repair industry at the apprentice level specializing in transmission repairs.

Topics and Scope:

1. An Introduction to Manual Transmissions and Drivelines
 - a. Power train types
 - b. Transmission design
 - c. Planetary gears
 - d. Rear axle design
 - e. Front wheel drive
2. The Clutch
 - a. Clutch operation and terminology
 - b. Clutch types
 - c. Clutch controls
3. Clutch Service
 - a. Diagnosis
 - b. Replacement
 - c. Hydraulic clutch controls
4. Manual Shift Transmission and Transaxles
 - a. Transmission function
 - b. Gears
 - c. Torque/Speed
 - d. Overdrive

- e. Synchromesh
- f. Gearshift linkage
- 5. Planetary Systems
 - a. Simple planetary
 - b. Simpson gear train
 - c. Ravigneaux gear train
- 6. Power Delivery
 - a. Drive lines
 - b. Drive line service
- 7. Driving Axles
 - a. Rear wheel drive
 - b. Front wheel drive
 - c. Differential operation
 - d. Axle shafts and bearings
- 8. Automatic Transmissions
 - a. Torque converters and fluid couplings
 - b. Hydraulic systems
 - c. Control devices
 - d. Gear trains
- 9. Holding Devices
 - a. Bands
 - b. Clutches
 - c. One-way clutches
- 10. Transmission Fluids, Filters and Coolers
 - a. Fluid types and requirements
 - b. Filters
 - c. Change intervals
- 11. Gasket, Seals, Bushings and Bearings
 - a. Types of seals
 - b. Bushing and bearing replacement
 - c. Thrust washers and snap rings
- 12. Diagnosis
 - a. Define the problem
 - b. Preliminary checks
 - c. Road test
 - d. Pressure testing
- 13. Transmission Removal and Installation
 - a. Safety concerns
 - b. Proper tools
 - c. Use of service manuals
 - d. Cleanliness of work area
- 14. Cleaning and Inspection
 - a. Replacement of parts
 - b. Reassembly
 - c. Installation and testing
- 15. Electrical and Electronic Transmission Controls
 - a. Electronic transmission shift controls
 - b. Torque converter clutch controls
 - c. Diagnosis and repair

Assignment:

Students will be required to keep a notebook of all class assignments and class notes. In the laboratory, students will be evaluated on their ability to follow industry approved diagnostic and repair procedures in a reasonable amount of time based on flat rate timetables. Students will complete work orders, diagnostic sheets, parts orders, and time sheets in a neat and readable manner.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Writing
0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab reports, Quizzes, Exams

Problem solving
5 - 10%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances, Performance exams

Skill Demonstrations
30 - 40%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Matching items, Completion

Exams
35 - 45%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance

Other Category
10 - 15%

Representative Textbooks and Materials:

Manual Transmissions and Transaxles by Jack Erjavec, Prentice Hall 2nd Ed., 1997

Automatic Transmissions and Transaxles, Published by Check Chart (no author), 3rd Ed. 1997