SOUTHWEST TECH
SOUTHWEST TECHNICAL COLLEGE

TEAU 1240 - Automatic Transmissions and Transaxles (4 Credits)

Course Description

Automotive Automatic Transmission and Transaxles is an-in depth clinical based course. Throughout the course, you will practice safety concerns when working on transmissions and drivetrain components, power flow through a planetary gear set, clutch pack diagnosis and operation, hydraulic circuits, removal and rebuilding procedures for automatic transmissions and transaxles, and torque converter operation. When you have completed this course, you will be eligible to take the certification exam in ASE (Automotive Service Excellence) Automotive Automatic Transmissions and Transaxles.

Course Objectives

- Diagnose automatic transmissions and transmission control systems.
- Remove, repair/rebuild and replace automatic transmissions and related systems.
- Diagnose and repair automatic hybrid drive systems.

Course Outline

- Drivetrain Basics
- Drivetrain Theory
- General Theories of Operation
- Electronic Controls
- Transmission Design
- Torque Converters and Pump
- Hydraulic Circuits and Controls
- Gears and Shafts
- Common Transmissions Reaction and Friction Units

Textbook & Reading Materials

Cengage Unlimited (1 year subscription), Cengage

Assignments and Assessments

Orientation
Orientation Acknowledgement
Student Information Sheet
Auto Transmissions Course Syllabus Review
Remind Txt Group
Auto Transmissions Competency Profile and Task List Review
Auto Transmissions Lab Assignment Checklist Review
Right-to-Know Agreement
COVID-19 Pandemic Policies and Procedures Agreement
Cleaning Expectations
Southwest Technical College Automotive Video Playlist
Student Tool and Equipment Use Waiver
Cell Phone
Digital Lab Assignment Switch
Instructions
Digital Lab Explanation
Module Breakdown
Module 1 Labs
Module 2 Labs
Module 3 Labs
Module 4 Labs
Module 5 Labs
Module 6 Labs
Module 7 Labs
Module 8 Labs
Module 9 Labs
Cleaning Labs
Cleaning Lab 1
Cleaning Lab 4
Cleaning Lab 3
Cleaning Lab 2
Cleaning Lab 5
Gear Ratios Explained
Planetary Gearset
How a Rear Differential Works
How a Constant Velocity Joint-Axle Works on a FWD Engine to Rear Axle
Driving Gear and Driven Gear
Freewheeling
Drive Link Chain
Planetary Gear Sets
Chapter Assessments
Chapter 1 Multiple Choice Quiz
Labeling Activity 1-1
Video 1-1 Questions
Lab Assignment 1 Diagnose fluid loss and condition concerns; check transmission fluid condition; check for leaks.
Lab Assignment 2 Drain and replace fluid and filter(s).
Lab Assignment 3 Check fluid level in a transmission or a transaxle equipped with a dip-stick.
Lab Assignment 4 Inspect power train mounts.
Lab Assignment 5 Identify purpose and demonstrate proper use of fender covers, mats.
Lab Assignment 6 Demonstrate use of the three (concern, cause, and correction).
Lab Assignment 7 Review vehicle history.
Lab Assignment 8 Ensure vehicle is prepared to return to customer.
Checkpoint Meeting Module 1
End Module 1
Reading
Force on Fluid and Measured by the Pressure Gauge
Displaced Area
Hydraulic Pressure and Force Transfer
Chapter 2 Multiple Choice Quiz
Chapter 2 Fill in the Blank Questions
Chapter 2 Short Answer Essay
Labeling Activity 2-1
Chapter 2 ASE-Style Review Questions
Voltage Drop Testing
Diagnostic Process
Repair Orders
Chapter 2 ASE-Style Review Questions
Video 2-1 Questions
Video 2-2 Questions
Lab Assignment 9 Identify and interpret transmission/transaxle concern
Lab Assignment 10 Diagnose fluid loss and condition concerns;check transmission fluid condition; check for leaks.
Lab Assignment 11 Inspect, leak test, and flush or replace transmission/transaxle oil cooler.
Lab Assignment 12 Check fluid level in a transmission or a transaxle not equipped with a dip-stick.
Lab Assignment 13 Check fluid level in a transmission or a transaxle equipped with a dip-stick.
Lab Assignment 14 Research applicable vehicle and service information.
Lab Assignment 15 Identify transmission make and model information.
Lab Assignment 16 Complete work order.
Lab Assignment 17 Check fluid level in a transmission or a transaxle equipped with a dip-stick.
Lab Assignment 18 Demonstrate proper use of precision measuring tools.
Checkpoint Meeting Module 2
End Module 2
Reading
Checking Fluid in a Transmission or Transaxle
Auxiliary Cooler with Inlet and Outlet Tubes
Accumulator Piston
Dual Clutch Transmissions
Operation of a Torque Converter
Transmission Control Module

Chapter 3 Multiple Choice Quiz
Chapter 3 Fill in the Blank Questions
Video 3-1 Questions
Video 3-2 Questions
Reading
Leaks in Front Pump, Front Pump Gasket and Converter
Change Automatic Transmission Filter
Video 3-3 Questions
Chapter 3 ASE-Style Review Questions
Chapter 3 ASE Challenge Questions
Lab Assignment 19 Identify and interpret transmission/transaxle concern.
Lab Assignment 20 Servicing automatic transmission/transaxle linkages.
Lab Assignment 21 Drain and replace fluid and filter(s).
Lab Assignment 22 Diagnose noise and vibration concerns.
Lab Assignment 23 Inspect, leak test, and flush or replace transmission/transaxle oil cooler.
Lab Assignment 24 Remove and reinstall transmission/transaxle and torque converter.
Lab Assignment 25: Check fluid level in a transmission or a transaxle equipped with a dip-stick.
Lab Assignment 26 Inspect converter flex (drive) plate, converter attaching bolts, etc.
Lab Assignment 27 Inspect for leakage at external seals, gaskets, and bushings; replace external seals, gaskets, and bushings.
Lab Assignment 28 Diagnose transmission/transaxle gear reduction/multiplication concerns.
Lab Assignment 29 Perform lock-up converter tests.
Checkpoint Meeting Module 3
End Module 3
CM CH 4 Reading
Using Ohm's Law
Series Circuit
Parallel Circuits
Series-Parallel Circuits
Applying Ohm's Law
Using the Voltmeter
Performing a Voltage Drop Test
Using the Ohmmeter
Using the Ammeter
Reading Wiring Diagrams
Testing For Opens
Testing For Shorts
Testing Switches
Testing Relays
Using the Lab Scope
Using the Scan Tool
Checking for Codes and Monitor Status
Electronic Shifting
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Electrons Passing to Protons Video/Animation
Wave on Voltage Measurement Over Time 1 Video/Animation
Wave on Voltage Measurement Over Time 2 Video/Animation
Wave on Voltage Measurement Over Time, Rising and Falling Slopes Video/Animation
Ohm's Law Video/Animation
Overview of a constant variable transmission Video/Animation
CM CH 4 Video 4-1 Questions
CM CH 4 Video 4-2 Questions
CM CH 4 Multiple Choice Quiz
CM CH 4 Fill in the Blank Questions
SM CH 4 Reading
Horn and Brake Lamps Circuit Video/Animation
Circuit Breaker, Switch and Lamp Video/Animation
Voltage Measurement Over Time Video/Animation
Noise and Glitches Video/Animation
Variable Resistance Crystal Video/Animation
Scan Tools Video/Animation
Purpose of Diagnostic Trouble Code (DTC) Video/Animation
Single Circuit Schematics Video/Animation
Transmission Solenoid Video/Animation
SM CH 4 Video 4-3 Questions
SM CH 4 Video 4-4 Questions
SM CH 4 ASE-Style Review Questions
SM CH 4 ASE Challenge Questions
Lab Assignment 30 Diagnose electrical/electronic control systems.
Lab Assignment 31 Inspect, test, adjust, repair, or replace electrical/electronic components.
Lab Assignment 32 Inspect, test, adjust, repair, or replace electrical/electronic components.
Lab Assignment 33 Describe the operational characteristics of a continuously variable transmission.
Lab Assignment 34 Describe the operational characteristics of a hybrid vehicle drive train.
Checkpoint Meeting Module 4
End Module 4
CM CH 5 Reading: Transmission Designs
Cylinder Wall with Seal Lip and Piston Video/Animation
Types and Usage of Seals and Gaskets Video/Animation
CM CH 5 Labeling Activity 5-1: Differential Parts ID
CM CH 5 Multiple Choice Quiz: Transmission Designs
SM CH 5 Reading: Rebuilding Transmissions and Transaxles
SM CH 5 Labeling Activity 5-2: External Transaxle Parts ID
SM CH 5 Photo Sequence 8: Measuring Input Shaft Thrust Play (Endplay)
SM CH 5 ASE-Style Review Questions: Rebuilding Transmissions and Transaxles
SM CH 5 ASE Challenge Questions: Rebuilding Transmissions and Transaxles
Lab Assignment 35 Perform pressure tests.
Lab Assignment 36 Remove and reinstall transmission/transaxle and torque converter.
Lab Assignment 37 Measure torque converter end play and check for interference.

Lab Assignment 38 Perform stall test.
Lab Assignment 39 Diagnose pressure concerns.
Checkpoint Meeting Module 5
End Module 5
Reading
Torque Converter Clutch Operation
Torque Converter Clutch Operation to Drive Input Shaft
Converter at Coupling Speed, Stator Overrunning
Video/Animation
Torque Converter Video/Animation
CM CH 6 Video 6-1 Questions: Operation of a torque converter
CM CH 6 Labeling Activity 6-1: Torque Converter Parts ID
CM CH 6 Multiple Choice Quiz: Torque Converters and Pumps
SM CH 6 Reading: Torque Converter and Oil Pump Service
Gear with Gauge 1 Video/Animation
Gear with Gauge 2 Video/Animation
Operation of a Torque Converter Lockup Clutch (TCC)
Video/Animation
SM CH 6 Labeling Activity 6-2: Auto Transmission Pump Parts ID
SM CH 6 Video 6-2 Questions: Operation of a torque converter lock-up clutch
SM CH 6 ASE-Style Review Questions: Torque Converter and Oil Pump Service
SM CH 6ASE Challenge Questions: Torque Converter and Oil Pump Service
Lab Assignment 40 Disassemble, measure, inspect, and reassemble an automatic transmission.(Tasks C6,7,8,9,10,11,12,13,14,15,16,19,20,21,22)
Checkpoint Meeting Module 6
End Module 6
CM CH 7 Reading
Fluid Flow Video/Animation
Fluid Flow with Spring Pressure Video/Animation
Function, Construction, and Operation of a Spool Valve
Video/Animation
Types and Functions of Automatic Transmission Valves
Video/Animation
Types of Spool Valves Video/Animation
CM CH 7 Video 7-1 Questions
CM CH 7 Video 7-2 Questions
CM CH 7 Multiple Choice Quiz
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SM CH 7 Video 7-3 Questions
SM CH 7 ASE-Style Review Questions
SM CH 7 ASE Challenge Questions
Lab Assignment 41 Disassemble, measure, inspect, and reassemble an automatic transmission.(Tasks C6,7,8,9,10,11,12,13,14,15,16,19,20,21,22)
Checkpoint Meeting Module 7
End Module 7
CM CH 8 Reading
Walk Around the Sun Gear Video/Animation
Walk Inside Ring Gear Video/Animation
Gear ratios Video/Animation
CM CH 8 Labeling Activity 8-1
CM CH 8 Video 8-1 Questions
CM CH 8 Multiple Choice Quiz
SM CH 8 Reading
SM CH 8 Labeling Activity 8-2
SM CH 8 Photo Sequence 13: Servicing Planetary Gear-Type Final Drive Units
SM CH 8 ASE-Style Review Questions
SM CH 8 ASE Challenge Questions
transmission.(Tasks C6,7,8,9,10,11,12,13,14,15,16,19,20,21,22)
Checkpoint Meeting Module 8
End Module 8
CM CH 9 Reading
Locked and Unlocked Gears Video/Animation
Automatic Transmission Rear Servo Operation
Video/Animation
Multi-disc Hydraulic Clutch Video/Animation
CM CH 9 Labeling Activity 9-1
CM CH 9 Video 9-1 Questions
CM CH 9 Multiple Choice Quiz
CM CH 9 Fill in the Blank Questions
SM CH 9 Reading
Service Limit Video/Animation
SM CH 9 Photo Sequence 14: Proper Procedure for Installing a Direct Clutch
SM CH 9 Labeling Activity 9-2
SM CH 9 ASE-Style Review Questions
SM CH 9 ASE Challenge Questions
CM CH 10 Reading
How a Dual Clutch Transmission Operates Simulation
CM CH 10 Labeling Activity 10-1
CM CH 10 Multiple Choice Quiz
SM CH 10 Reading
SM CH 10 Labeling Activity 10-2
SM CH 10 Labeling Activity 10-3
SM CH 10 ASE-Style Review Questions
SM CH 10 ASE Challenge Questions
Lab Assignment 43 Disassemble, measure, inspect, and reassemble an automatic transmission.(Tasks C6,7,8,9,10,11,12,13,14,15,16,19,20,21,22)
Checkpoint Meeting Module 9
End Module 9
End of Course Survey
Competency Profile
Final Exam Review
Final Exam

Subject to change. Please consult your Canvas course for the most current instructions and updates.

Classroom Hours

Mo, Tu, W, Th
8:00 AM - 12:00 PM
1:00 PM - 5:00 PM

Friday
8:00 AM - 12:00 PM

For a full list of course hours visit: Course Schedule

Instructor Contact Information

Cody Dawson — cdawson@stech.edu
Shad Esplin — sesplin@stech.edu
Dallin Robinson — drobinson@stech.edu
McKael Stapel — mstapel@stech.edu

Office Hours: By appointment

Email is the preferred method of communication; you will receive a response within 24 hours during regular business hours.

Canvas Information

Canvas is the where course content, grades, and communication will reside for this course.

- stech.instructure.com
- For Canvas passwords or any other computer-related technical support contact Student Services.
- For regular Hours and Weekdays call (435) 586 - 2899.
- For after Hours & Weekends call (435) 865 - 3929 (Leave a message if no response).

Course Policies

Class attendance is required, this is not an online course. Attendance is required during your scheduled time.
Grade Scale — A: 100 - 90%, B: 89 - 80%, F: 79% or lower.
Cell phones for many have become a distraction. When you are in class or lab we encourage you to keep your cell phones put away in a secure location. If you use ear buds we ask that you only use one so you can still hear the things going on around you. If you are using your phone for things other than school related items, instructors will ask you to put them away. Please follow the direction of your instructors. Those who have been asked to refrain from using your cell phone and fail to do so will be asked to meet with the Director of Transportation and student services will be notified.
The program is designed to provide the student with as much hands-on work as possible. In the automotive industry you may be required to lift heavy objects and stand for hours at a time to complete work required. Technicians deal with chemicals and materials which require caution, these will be identified in the Right to Know Agreement provided to you. You will also be required to use computers to track and complete work.

High School Power School Grades: Quarter student grades will be determined by student progress percentage. Faculty will use the higher percentage of either 1) quarter progress, or 2) cumulative progress for the current training plan year. The progress percentage will be used with the grading scale to determine the minimum grade. High School Grade Scale: The following grading scale will be used to determine a letter grade from the progress percentage:

- A : 94 - 100%
- A- : 90 - 93%
- B+ : 87 - 89%
- B : 83 - 86%
- B- : 80 - 82%
- C+ : 77 - 79%
- C : 73 - 76%
- C- : 70 - 72%
- D+ : 67 - 69%
- D : 63 - 66%
- D- : 60 - 62%
- F : 0 - 59%

Additional Information

InformaCast Statement: Southwest Tech uses InformaCast to ensure the safety and well-being of our students. In times of emergency, such as weather closures and delays, this app allows us to promptly deliver notifications directly to your mobile devices. To stay informed and receive real-time updates, we encourage all students to sign up for notifications. Your safety is our priority, and staying connected ensures a swift response to any unforeseen circumstances. More information and directions for signing up are available at: https://stech.edu/emergency-notifications/

Internet Acceptable Use Policy: The student is expected to review and follow the Southwest Technical College Internet Safety Policy at: https://stech.edu/students/policies/

Student Code of Conduct Policy: The student is expected to review and follow the Southwest Technical College Student Code of Conduct Policy at: https://stech.edu/students/policies/

Accommodations: Students with medical, psychological, learning, or other disabilities desiring accommodations or services under ADA, must contact the Student Services Office. Student Services determines eligibility for and authorizes the provision of these accommodations and services. Students must voluntarily disclose that they have a disability, request an accommodation, and provide documentation of their disability. Students with disabilities may apply for accommodations, based on an eligible disability, through the Student Services office located at 757 W. 800 S., Cedar City, UT 84720, and by phone at (435) 586-2899. No diagnostic services are currently available through Southwest Technical College.

Safety and Building Maintenance: The College has developed and follows a variety of plans to ensure the safe and effective operation of its facilities and programs. The following plans are available online:
1) Facilities Operations and Maintenance Plan; 2) Technical Infrastructure Plan; and 3) Health and Safety Plan.

Withdrawals and Refunds: Please refer to the Southwest Technical College Refund Policy at:
https://stech.edu/students/policies/

Any high school or adult student, who declares a technical training objective is eligible for admission at Southwest Technical College (Southwest Tech). Program-specific admissions requirements may exist and will be listed on the Southwest Tech website. A high school diploma or equivalent is not required for admission but is mandatory for students seeking Title IV Federal Financial Aid.

Non-Discriminatory Policy: Southwest Technical College affirms its commitment to promote the goals of fairness and equity in all aspects of the educational enterprise, and bases its policies on the idea of global human dignity.

Southwest Tech is committed to a policy of nondiscrimination. No otherwise qualified person may be excluded from participation in or be subjected to discrimination in any course, program or activity because of race, age, color, religion, sex, pregnancy, national origin or disability. Southwest Technical College does not discriminate on the basis of sex in the education programs or activities that it operates, as required by Title IX and 34 CFR part 106. The requirement not to discriminate in education programs or activities extends to admission and employment. Inquiries about Title IX and its regulations to STECH may be referred to the Title IX Coordinator, to the Department of Education, and/or to the Office for Civil rights.

If you believe you have experienced discrimination or harassment on our campus, please contact the Title IX Coordinator, Cory Estes: cestes@stech.edu, (435) 865-3938.

For special accommodations, please contact the ADA Coordinator, Cyndie Tracy: ctracy@stech.edu, (435) 865-3944.
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