



## AUTT 2030

### AUTOMOTIVE AUTOMATIC TRANSMISSIONS AND TRANSAXLES

#### MASTER COURSE SYLLABUS

*Instructors will provide students with additional course-specific information, including attendance/makeup policies, assignment/test scheduling, and instructor contact information, as necessary and appropriate.*

<b>Prerequisite(s):</b>	AUTT 1010, AUTT 1020
<b>Co-requisite(s):</b>	None
<b>Term(s) Offered:</b>	Summer
<b>Class Hours:</b>	2
<b>Lab Hours:</b>	7
<b>Credit Hours:</b>	5

#### Course Description

This course introduces students to basic automatic transmission/transaxle theory, operation, inspection, service, and repair procedures as well as electronic diagnosis and repair. Topics include general automatic transmission and transaxle diagnosis, in vehicle and off vehicle transmission and transaxle maintenance, adjustment and repair.

#### Course Competencies and Student Learning Outcomes

##### General Transmission and Transaxle Diagnosis

Order	Description
1	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause and correction.
2	Identify and interpret transmission/transaxle concern; differentiate between engine performance and transmission/transaxle concerns; determine necessary action.
3	Research applicable vehicle and service information, such as transmission/transaxle system operation, fluid type, vehicle service history, service precautions, and technical service bulletins.
4	Locate and interpret vehicle and major component identification numbers.
5	Diagnose fluid loss and condition concerns; check fluid level in transmissions with and without dipstick; determine necessary action.
6	Perform pressure tests (including transmissions/transaxles equipped with electronic pressure control); determine necessary action.
7	Perform stall test; determine necessary action.
8	Perform lock-up converter system tests; determine necessary action.
9	Diagnose noise and vibration concerns; determine necessary action.
10	Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.
11	Diagnose pressure concerns in a transmission using hydraulic principles (Pascal's Law)
12	Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information.

## In-Vehicle Transmission/Transaxle Maintenance and Repair

Order	Description
1	Inspect, adjust, and replace manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch.
2	Inspect and replace external seals, gaskets, and bushings.
3	Inspect, test, adjust, repair, or replace electrical/electronic components and circuits, including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses.
4	Diagnose electronic transmission control systems using a scan tool; determine necessary action.
5	Inspect, replace, and align powertrain mounts.
6	Service transmission; perform visual inspection; replace fluid and filters.

## Off-Vehicle Transmission and Transaxle Repair

Order	Description
1	Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mating surfaces.
2	Disassemble, clean, and inspect transmission/transaxle.
3	Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, check valves/balls, screens, spaces, and gaskets).
4	Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action.
5	Assemble transmission/transaxle.
6	Inspect, leak test, and flush or replace transmission/transaxle oil cooler, lines, and fittings.
7	Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore.
8	Install and seat torque converter to engage drive/splines.
9	Inspect, measure, and reseal oil pump assembly and components.
10	Measure transmission/transaxle end play or preload; determine necessary action.
11	Inspect, measure, and replace thrust washers and bearings.
12	Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls.
13	Inspect bushings; determine necessary action.
14	Inspect and measure planetary gear assembly components; determine necessary action.
15	Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action.
16	Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action.
17	Inspect, measure, repair, adjust or replace transaxle final drive components.
18	Inspect clutch drum, piston, check-balls, springs, retainers, seals, and friction and pressure plates; determine necessary action.
19	Measure clutch pack clearance; determine necessary action.
20	Air test operation of clutch and servo assemblies.
21	Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action.
22	Inspect bands and drums; determine necessary action.
23	Describe the operational characteristics of a continuously variable transmission (CVT).
24	Describe the operational characteristics of a hybrid vehicle drive train.

## Required Textbook(s) and Materials

Students enrolled in this course are obligated to have the following:

Automotive Technology 3<sup>rd</sup> ed.  
Halderman, James D..  
ISBN 978-0-13-175477-5

## Grading Scale

The grading scale is detailed in the *Catalog and Student Handbook* and listed below for reference. All faculty members follow this scale when assigning grades to reflect a given student's performance in the classroom.

<b>Grade</b>	<b>Numerical Equivalent</b>	<b>Grade Point</b>
A/A*	90-100	4
B/B*	80-89	3
C/C*	70-79	2
D/D*	60-69	1
F/F*	0-59	0

Effective Summer Quarter 2006, Athens Technical College replaced the S/U grading system used for learning support classes with an A\*-F\* grading system. The registrar uses an asterisk (A\*, B\*, C\*, D\*, F\*, W\*, WF\*, WP\*) to designate learning support course grades on transcripts and grade reports because these grades are not components of the term grade point average.

### **Academic Support Center:**

The Academic Support Centers of Athens Technical College (ATC) provide free tutoring for enrolled students. Both instructors and peer tutors provide tutoring in almost all subjects offered by the college. Information about the Center is accessible via the ATC website at <http://www.athenstech.edu/StudentDevelopmentServices/AcademicSupportCenter>. To find out the specific services available on the Athens, Greene, and Walton Campuses, please call (706) 583-2839. To contact the Academic Support Center on the Elbert County Campus, please call (706) 213-2129.

### **Attendance**

Regular class attendance is important and expected. The college considers both tardiness and early departure from class as forms of absenteeism. Students absent from class for any reason are still responsible for all work missed. Instructors have the right to determine whether work missed can be made up and have the liberty to set reasonable expectations for attendance based on frequency of class meetings and on the instructional delivery method, subject, type, and level of the class. Class attendance policies will be clearly stated for students by their respective instructors on separate documents (course outlines/schedules) or appendices to the master syllabus.

### **Course Withdrawal**

Students may withdraw from a course without academic penalty until the midpoint of the term. Students withdrawing after the midpoint of the term receive grades of WP – Withdrawal Passing, or WF – Withdrawal Failing. Students who stop attending class(es) without formally withdrawing risk earning a final grade of F, which will appear on the academic transcript. Withdrawing from a course may impact financial aid status, academic standing, and GPA. Refer to the ATC *Catalog and Student Handbook* for further details. <http://www.athenstech.edu/Catalog/>

### **Course Technology**

Course addendum will provide details concerning the use of technology in the course. Course schedule types include **web-enhanced** – taught face-to-face; **online** – taught online using the internet, may require proctored exam; **hybrid** – class time is split between face-to-face and online; **video conference** – taught at two or more campus locations simultaneously with instructor located at one of the classroom locations. More details are available on the Athens Technical College website. <http://www.athenstech.edu/eLearning/CourseList.cfm>

### **Continuation of Instruction**

In the event of severe weather or other emergency, students will be expected to continue participating in learning activities via ANGEL, Athens Technical College email, or other modality. Instructors will provide a plan for the continuation of instruction.

### **Work Ethics:**

To fulfill the responsibility to teach essential workplace ethics, the college provides students instruction in, and evaluates students on, the following ten work ethics traits: attendance, character, teamwork, appearance, attitude, productivity, organizational skills, communication, cooperation, and respect. To best equip students for successful workplace experiences in their chosen profession, instruction and evaluation takes place in the context of their program of study.

### **Academic Honesty**

Academic honesty is expected at all times. Any student found to have engaged in academic misconduct such as

cheating, plagiarism, or collusion is subject to disciplinary sanctions as outlined in the Student Code of Conduct detailed in the *ATC Catalog and Student Handbook*. See the following link for the complete Academic Honesty policy.

<http://www.athenstech.edu/StudentAffairs/AcademicHonesty/Academic%20Honesty.pdf>

Students are also advised to complete the tutorial on Academic Honesty available here:

<http://www.athenstech.edu/StudentAffairs/AcademicHonesty>

### **Americans with Disabilities Act**

It is our goal at Athens Technical College to provide equal access to education for all students. Any student with a documented disability is eligible to receive reasonable academic adjustments and auxiliary aids in the classroom and/or for testing at Athens Technical College, as long as appropriate documentation of the disability has been submitted to the Disability Services Office in a timely manner. Students can access the application packet on our website.

[http://www.athenstech.edu/CurrentStudents/orientation/files/disability\\_services\\_application.pdf](http://www.athenstech.edu/CurrentStudents/orientation/files/disability_services_application.pdf)

### **Cell Phones and Electronic Devices**

Cell phone use in the classroom for non-instructional purposes, with the exception of receiving emergency notifications, is prohibited.

### **Food/Drinks in Classroom**

Food and beverages (other than water) are not allowed in classrooms/labs.

### **Communication with ATC Faculty and Staff**

Students, faculty, and staff must use Athens Technical College email and ANGEL accounts for all college-related communications. Students are obligated to check their email and ANGEL accounts on a regular basis, preferably daily.

### **Warranty of Graduates**

The Technical College System of Georgia warrants every graduate of technical programs in which students may earn technical certificates of credit, diplomas, or associate degrees. The warranty guarantees that graduates demonstrate the knowledge and skills and can perform each competency as identified in the industry-validated standards established for every program of study. If one of our graduates educated under a standard program or his/her employer finds that the graduate is deficient in one or more competencies as defined in the course/program standards, Athens Technical College will retrain the employee at no instructional cost to the employee or the employer. This guarantee is in effect for two years after graduation.

### **TEACH Act**

According to the TEACH Act of 2002, Athens Technical College is obligated to advise you that instructional material included in this course may be subject to copyright protection. As such, you must not share, duplicate, transmit, or store the material of this course beyond the purpose and time frame explicitly stated in the syllabus of your course. If you are not certain whether a particular piece of material is covered by copyright protection, you should contact your instructor and obtain his/her written clarification. Failing to observe copyright protection is a violation of law.