SYLLABUS

DATE OF LAST REVIEW : 02/11/2013
CIP CODE: 47.0604
SEMESTER: Departmental Syllabus
COURSE TITLE: Automatic Transmission
COURSE NUMBER: AUTT0221
CREDIT HOURS: 6
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
EMAIL : KCKCC issued email accounts are the official means for electronically communicating with our students.

PREREQUISITE(S): AUTT0101, AUTT0102, or approval from instructor

REQUIRED TEXT AND MATERIALS:
Please see bookstore for current textbook(s) and other required material.

COURSE DESCRIPTION:
This course contains competencies that can be used in their entirety within a single course or as needed for courses designed by a Kansas institution as Institutional Flexible Credit. Through a variety of learning and assessment activities students can: explore the concept of theory and operation of automatic transmissions/transaxles; perform maintenance on an automatic transmission/transaxle; perform service on an automatic transmission/transaxle; diagnose automatic transmission/transaxles; inspect automatic transmission/transaxles; remove and reinstall automatic transmission; remove and reinstall automatic transaxles; disassemble automatic transmission and components; disassemble automatic transaxles and components; inspect automatic transmission components; inspect automatic transaxles and components; repair automatic transmission
and components; repair automatic transaxles and components; reassemble automatic transmission and components; reassemble automatic transaxles and components.

**METHOD OF INSTRUCTION:**

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

**COURSE OUTLINE:**

All students must 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.

I. The theory and operation of automatic transmissions/transaxle
   A. Completing work orders
   B. Understanding the difference between concerns of engine performance and transmission/transaxle
   C. Researching vehicle and service information
      1. Transmission/transaxle system operation
      2. Fluid type
      3. Vehicle service history
      4. Service precautions
      5. Technical service bulletins
   D. Location of vehicle and major component identification numbers.
   E. Gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.
   F. Valve body
   G. Inspection
      1. Servo
      2. Accumulator
      3. Pistons
      4. Seals
      5. Pins
      6. Springs
      7. Retainers
   H. Assembly of transmission/transaxle.
   I. Oil cooler
      1. Lines
      2. Flushing
      3. Fittings
   J. Flex plate
   K. Converter
L. Converter installation
M. Planetary gear components
N. Inspection
   1. Case
   2. Bores
   3. Passages
   4. Bushings
   5. Vents
   6. Mating Surfaces
   7. Drive link
   8. Chain
   9. Sprockets
  10. Bearings
O. Final drive components.
   1. Clutch drum
   2. Piston
   3. Check-ball springs
   4. Retainers
   5. Seals
   6. Friction and pressure plates
P. Clutch pack clearance
Q. Air test clutches and servos
R. Roller and Sprag clutches
S. Continuously variable transmission (CVT).
T. Describe the operational characteristics of a hybrid vehicle drive train
II. Perform maintenance on an automatic transmission/transaxle
A. Checking fluid levels
   1. With dipstick
   2. Without dip-stick
B. Service transmission
   1. Visual inspections
   2. Replacing fluids and filters
   3. Flushing
C. Leak inspection
III. Perform service on an automatic transmission/transaxle
A. Diagnosing fluid loss
B. Adjusting and replacing
   1. Manual valve shift linkage
   2. Range sensor/switch
   3. Park/neutral position switch
C. Inspection and replacement
   1. External seals
   2. Gaskets
   3. Bushings
D. Electrical/electronic components
E. Inspect and align powertrain mounts
IV. Diagnosing automatic transmission/transaxles
   A. Performing pressure tests
   B. Performing stall test
   C. Performing lock-up converter system tests
   D. Diagnosing noise and vibration concerns
   E. Diagnosing transmission/transaxle gear reduction/multiplication
      1. Driving, driven, and held member (power flow) principles
   F. Diagnosing pressure concerns in a transmission using hydraulic principles
      (Pascal’s Law).
   G. Diagnosing electronic transmission/transaxle control systems using appropriate
      test equipment and service information.
   H. Inspection
      1. External seals
      2. Gaskets
      3. Bushings
   I. Scan tool diagnosis
   J. Electrical and electronic diagnostics

V. Inspection of automatic transmission/transaxles
   A. Inspection of linkages
   B. Leak inspection techniques
   C. Electrical
      1. Switches
      2. Harnesses

VI. Removal and reinstallation of automatic transmission
    A. Transmission/transaxle
    B. Torque converter
    C. Engine core plugs
    D. Rear crankshaft seal
    E. Dowel pins
    F. Dowel pin holes
    G. Mating surfaces

VII. Removal and reinstallation of automatic transaxles
     A. Transmission/transaxle
     B. Torque converter
     C. Engine core plugs
     D. Rear crankshaft seal
     E. Dowel pins
     F. Dowel pin holes
     G. Mating surfaces

VIII. Disassembly of automatic transmission and components
      A. Disassembly
      B. Cleaning
      C. Inspection
      D. Measurement
      E. Valve body
      F. Servos
G. Accumulator bores
H. Pistons
I. Seals
J. Pins
K. Springs
L. Oil pump assembly
M. Bands and drums

IX. Disassembly of automatic transaxles and components
   A. Disassembly
   B. Cleaning
   C. Inspection
   D. Measurement
   E. Valve body
   F. Servos
   G. Accumulator bores
   H. Pistons
   I. Seals
   J. Pins
   K. Springs
   L. Oil pump assembly
   M. Bands and drums
   N. Transaxle drive
      1. Link chains
      2. Sprockets
      3. Gears
      4. Gearings
      5. Bushings

X. Inspection of automatic transmission components
   A. Measure valve body components
   B. Internal components
      1. Accumulator
      2. Bores
      3. Pistons
      4. Seals
      5. Pins
      6. Springs
      7. Retainers
   C. Converter
      1. Bolts
      2. Pilot
      3. Pump
      4. End play
      5. Drive/splines.
   D. Oil pump assembly
   E. Endplay
   F. Thrust washers and bearings
G. Oil delivery circuits
   1. Seal rings
   2. Grooves
   3. Surface areas
   4. Feed pipes
   5. Orifices
   6. Check valves/balls
H. Bushings
I. Planetary gear assemblies
J. Case bores
K. Passages
L. Vents
M. Clutch drum
N. Friction discs
O. Pressure plates
P. Clutch pack clearance
Q. Air test operation of clutch and servo assemblies
R. Roller and sprag clutch
S. Bands and drums
XI. Inspect automatic transaxles and components
   A. Measure valve body components
   B. Internal components
      1. Accumulator
      2. Bores
      3. Pistons
      4. Seals
      5. Pins
      6. Springs
      7. Retainers
   C. Converter
      1. Bolts
      2. Pilot
      3. Pump
      4. End play
      5. Drive/splines.
   D. Oil pump assembly
   E. Endplay
   F. Thrust washers and bearings
   G. Oil delivery circuits
      1. Seal rings
      2. Grooves
      3. Surface areas
      4. Feed pipes
      5. Orifices
      6. Check valves/balls
   H. Bushings
I. Planetary gear assemblies
J. Case bores
K. Passages
L. Vents
M. Clutch drum
N. Friction discs
O. Pressure plates
P. Clutch pack clearance
Q. Air test operation of clutch and servo assemblies
R. Roller and sprag clutch
S. Bands and drums
T. Transaxle drive
  1. Link chains
  2. Sprockets
  3. Gears
  4. Bearings
  5. Bushings
U. Transaxle final drive components

XII. Repairing automatic transmissions and components
A. Valve body
B. Seals
C. Servos
D. Accumulators
E. Springs
F. Retainers
G. Pilots
H. Oil pump
I. Thrust washers
J. Clutches
K. Bearings
L. Rings
M. Planetary gears
N. Feed pipes
O. Clutch drums
P. Piston
Q. Friction/pressure plates
R. Clutch pack clearance
S. One way clutches
T. End play

XIII. Repair automatic transaxles and components
A. Valve body
B. Seals
C. Servos
D. Accumulators
E. Springs
F. Retainers
G. Pilots
H. Oil pump
I. Thrust washers
J. Clutches
K. Bearings
L. Rings
M. Planetary gears
N. Feed pipes
O. Clutch drums
P. Piston
Q. Friction/pressure plates
R. Clutch pack clearance
S. One way clutches
T. End play
U. Transaxle drive
  1. Link chains
  2. Sprockets
  3. Gears
  4. Bearings
  5. Bushings
V. Transaxle final drive components
XIV. Reassemble automatic transmission and components
   A. Clutch installation
   B. Seals
   C. Drums
   D. Bands
   E. Servos
   F. Accumulators
   G. Gaskets
   H. Endplay
   G. Clutch gap
   H. Governor
   I. Valve body
   J. Bushings
   K. Planetary gears
   L. One way clutches
   M. Torque converter spine engagement
   N. Oil pump
   O. Air test
   P. Oil feed pipes
XV. Reassemble automatic transaxles and components
   A. Clutch installation
   B. Seals
   C. Drums
   D. Bands
   E. Servos
F. Accumulators  
G. Gaskets  
H. Endplay  
G. Clutch gap  
H. Governor  
I. Valve body  
J. Bushings  
K. Planetary gears  
L. One way clutches  
M. Torque converter spine engagement  
N. Oil pump  
O. Air test  
P. Oil feed pipes  
Q. Transaxle drive  
R. Link chains  
S. Sprockets  
T. Gears  
U. Transaxle final drive components

EXPECTED LEARNER OUTCOMES:

A. The student will describe the concept of theory and operation of automatic transmissions/transaxles  
B. The student will perform maintenance on an automatic transmission/transaxle  
C. The student will perform service on an automatic transmission/transaxle  
D. The student will diagnose automatic transmission/transaxles  
E. The student will inspect automatic transmission/transaxles  
F. The student will remove and reinstall automatic transmission  
G. The student will remove and reinstall automatic transaxles  
H. The student will disassemble automatic transmission and components  
I. The student will disassemble automatic transaxles and components  
J. The student will inspect automatic transmission components  
K. The student will inspect automatic transaxles and components  
L. The student will repair automatic transmission and components  
M. The student will repair automatic transaxles and components  
N. The student will reassemble automatic transmission and components  
O. The student will reassemble automatic transaxles and components

COURSE COMPETENCIES:

The student will be able to explore the concept of theory and operation of automatic transmissions/transaxles

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 transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles
6. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, checkvalves/balls, screens, spacers, and gaskets)
7. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action
8. Assemble transmission/transaxle
9. Inspect, leak test, and flush or replace transmission/transaxle oil cooler, lines, and fittings
10. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore
11. Install and seat torque converter to engage drive/splines
12. Inspect, measure, and reseal oil pump assembly and components
13. Measure transmission/transaxle end play or preload; determine necessary action
14. Inspect, measure, and replace thrust washers and bearings
15. Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls
16. Inspect bushings; determine necessary action
17. Inspect and measure planetary gear assembly components; determine necessary action.
18. Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action
19. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
20. Inspect, measure, repair, adjust or replace transaxle final drive components
21. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
22. Measure clutch pack clearance; determine necessary action
23. Air test operation of clutch and servo assemblies
24. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
25. Inspect bands and drums; determine necessary action
26. Describe the operational characteristics of a continuously variable transmission (CVT).
27. Describe the operational characteristics of a hybrid vehicle drive train
   The student will be able to perform maintenance on an automatic transmission/transaxle
28. Diagnose fluid loss and condition concerns; check fluid level in transmissions with
29. and without dip-stick; determine necessary action
30. Inspect, adjust and replace manual valve shift linkage, transmission range 31.
   sensor/switch, and park/neutral position switch
31. Inspect and replace external seals, gaskets, and bushings
32. Inspect, test, adjust, repair, or replace electrical/electronic components and circuits, including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses.

33. Diagnose electronic transmission control systems using a scan tool; determine necessary action.

34. Inspect, replace, and align powertrain mounts.

35. Service transmission; perform visual inspection; replace fluids and filters.

36. Inspect, leak test, and flush or replace transmission/transaxle oil cooler, lines, and fittings.

   The student will be able to perform service on an automatic transmission/transaxle.

37. Diagnose fluid loss and condition concerns; check fluid level in transmissions with and without dip-stick; determine necessary action.

38. Inspect, adjust and replace manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch.

39. Inspect and replace external seals, gaskets, and bushings.

40. Diagnose noise and vibration concerns; determine necessary action.

41. Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.

42. Diagnose pressure concerns in a transmission using hydraulic principles (Pascal’s Law).

43. Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information.

44. Inspect, adjust and replace manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch.

45. Inspect and replace external seals, gaskets, and bushings.

46. Inspect, test, adjust, repair, or replace electrical/electronic components and circuits, including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses.

47. Diagnose electronic transmission control systems using a scan tool; determine necessary action.

48. Inspect, replace, and align powertrain mounts.

49. Service transmission; perform visual inspection; replace fluids and filters.

50. Inspect, leak test, and flush or replace transmission/transaxle oil cooler, lines, and fittings.

   The student will be able to inspect automatic transmission/transaxles.

51. Perform pressure tests (including transmission/transaxles equipped with electronic pressure control); determine necessary action.

52. Perform stall test; determine necessary action.

53. Perform lock-up converter system tests; determine necessary action.

54. Diagnose noise and vibration concerns; determine necessary action.

55. Diagnose transmission/transaxle gear reduction/multiplication concerns using 51. driving, driven, and held member (power flow) principles.

56. Diagnose pressure concerns in a transmission using hydraulic principles (Pascal’s Law).

57. Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information.

58. Inspect, adjust and replace manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch.

59. Inspect and replace external seals, gaskets, and bushings.

60. Inspect, test, adjust, repair, or replace electrical/electronic components and circuits, including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses.

   The student will be able to inspect automatic transmission/transaxles.

61. Perform pressure tests (including transmission/transaxles equipped with electronic pressure control); determine necessary action.
57. Perform stall test; determine necessary action
58. Perform lock-up converter system tests; determine necessary action
59. Diagnose noise and vibration concerns; determine necessary action
60. Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles
61. Diagnose pressure concerns in a transmission using hydraulic principles (Pascal’s Law)
62. Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information
63. Inspect, adjust and replace manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch
64. Inspect and replace external seals, gaskets, and bushings
65. Inspect, test, adjust, repair, or replace electrical/electronic components and circuits, including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses

The student will be able to remove and reinstall automatic transmission

66. Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mating surfaces
67. Inspect, replace, and align powertrain mounts

The student will be able to remove and reinstall automatic transaxles

68. Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mating surfaces
69. Inspect, replace, and align powertrain mounts

The student will be able to disassemble automatic transmission and components

70. Diagnose electronic transmission control systems using a scan tool; determine necessary action
71. Disassemble, clean, and inspect transmission/transaxle
72. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, checkvalves/balls, screens, spacers, and gaskets)
73. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action
74. Assemble transmission/transaxle
75. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore
76. Install and seat torque converter to engage drive/splines
77. Inspect, measure, and reseal oil pump assembly and components
78. Measure transmission/transaxle end play or preload; determine necessary action
79. Inspect, measure, and replace thrust washers and bearings
80. Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls
81. Inspect bushings; determine necessary action
82. Inspect and measure planetary gear assembly components; determine necessary action.
83. Inspect case bores, passages, bushings, vents, and mating surfaces; determine
necessary action
84. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
85. Inspect, measure, repair, adjust or replace transaxle final drive components
86. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
87. Measure clutch pack clearance; determine necessary action
88. Air test operation of clutch and servo assemblies
89. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
90. Inspect bands and drums; determine necessary action

The student will be able to disassemble automatic transaxles and components
91. Diagnose electronic transmission control systems using a scan tool; determine necessary action
92. Disassemble, clean, and inspect transmission/transaxle
93. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, checkvalves/balls, screens, spacers, and gaskets)
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102. Inspect bushings; determine necessary action
103. Inspect and measure planetary gear assembly components; determine necessary action.
104. Inspect case bores, passages, bushings, vents, and mating surfaces; determine 105. necessary action
105. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
106. Inspect, measure, repair, adjust or replace transaxle final drive components
107. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
108. Measure clutch pack clearance; determine necessary action
109. Air test operation of clutch and servo assemblies
110. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
111. Inspect bands and drums; determine necessary action

The student will be able to inspect automatic transmission components
112. Diagnose electronic transmission control systems using a scan tool; determine necessary action
113. Disassemble, clean, and inspect transmission/transaxle
114. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, checkvalves/balls, screens, spacers, and gaskets)
115. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action
116. Assemble transmission/transaxle
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123. Inspect bushings; determine necessary action
124. Inspect and measure planetary gear assembly components; determine necessary action.
125. Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action
126. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
127. Inspect, measure, repair, adjust or replace transaxle final drive components
128. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
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130. Air test operation of clutch and servo assemblies
131. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
132. Inspect bands and drums; determine necessary action

The student will be able to inspect automatic transaxles and components
133. Diagnose electronic transmission control systems using a scan tool; determine necessary action
134. Disassemble, clean, and inspect transmission/transaxle
135. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, checkvalves/balls, screens, spacers, and gaskets)
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146. Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action
147. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
148. Inspect, measure, repair, adjust or replace transaxle final drive components
149. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
150. Measure clutch pack clearance; determine necessary action
151. Air test operation of clutch and servo assemblies
152. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
153. Inspect bands and drums; determine necessary action

The student will be able to repair automatic transmission and components

154. Disassemble, clean, and inspect transmission/transaxle
155. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, checkvalves/balls, screens, spacers, and gaskets)
156. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action
157. Assemble transmission/transaxle
158. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore
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164. Inspect bushings; determine necessary action
165. Inspect and measure planetary gear assembly components; determine necessary action.
166. Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action
167. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
168. Inspect, measure, repair, adjust or replace transaxle final drive components
169. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
170. Measure clutch pack clearance; determine necessary action
171. Air test operation of clutch and servo assemblies
172. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
173. Inspect bands and drums; determine necessary action

The student will be able to repair automatic transaxles and components

174. Disassemble, clean, and inspect transmission/transaxle
175. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, checkvalves/balls, screens, spacers, and gaskets)
176. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action
177. Assemble transmission/transaxle
178. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, 179. converter pump drive surfaces, converter end play, and crankshaft pilot bore
179. Install and seat torque converter to engage drive/splines
180. Inspect, measure, and reseal oil pump assembly and components
181. Measure transmission/transaxle end play or preload; determine necessary action
182. Inspect, measure, and replace thrust washers and bearings
183. Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls
184. Inspect bushings; determine necessary action
185. Inspect and measure planetary gear assembly components; determine necessary action.
186. Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action
187. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
188. Inspect, measure, repair, adjust or replace transaxle final drive components
189. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
190. Measure clutch pack clearance; determine necessary action
191. Air test operation of clutch and servo assemblies
192. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
193. Inspect bands and drums; determine necessary action

The student will be able to reassemble automatic transmission and components

194. Diagnose electronic transmission control systems using a scan tool; determine necessary action
195. Disassemble, clean, and inspect transmission/transaxle
196. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, checkvalves/balls, screens, spacers, and gaskets)
197. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action
198. Assemble transmission/transaxle
200. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore
201. Install and seat torque converter to engage drive/splines
202. Inspect, measure, and reseal oil pump assembly and components
203. Measure transmission/transaxle end play or preload; determine necessary action
204. Inspect, measure, and replace thrust washers and bearings
205. Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls
206. Inspect bushings; determine necessary action
207. Inspect and measure planetary gear assembly components; determine necessary action.
208. Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action
209. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
210. Inspect, measure, repair, adjust or replace transaxle final drive components
211. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
212. Measure clutch pack clearance; determine necessary action
213. Air test operation of clutch and servo assemblies
214. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
215. Inspect bands and drums; determine necessary action

  The student will be able to reassemble automatic transaxles and components

216. Diagnose electronic transmission control systems using a scan tool; determine necessary action
217. Disassemble, clean, and inspect transmission/transaxle
218. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, check valves/balls, screens, spacers, and gaskets)
219. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action
220. Assemble transmission/transaxle
221. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore
222. Install and seat torque converter to engage drive/splines
223. Inspect, measure, and reseal oil pump assembly and components
224. Measure transmission/transaxle end play or preload; determine necessary action
225. Inspect, measure, and replace thrust washers and bearings
226. Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls
227. Inspect bushings; determine necessary action
228. Inspect and measure planetary gear assembly components; determine necessary action.
229. Inspect case bores, passages, bushings, vents, and mating surfaces; determine
necessary action
230. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action
231. Inspect, measure, repair, adjust or replace transaxle final drive components
232. Inspect clutch drum, piston, check-balls springs, retainers, seals, and friction and pressure plates; determine necessary action
233. Measure clutch pack clearance; determine necessary action
234. Air test operation of clutch and servo assemblies
235. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action
236. Inspect bands and drums; determine necessary action

ASSESSMENT OF LEARNER OUTCOMES:
Assessment methods may include, but are not limited to, the following: Homework, Assignments, Quizzes, Class Participation, Chapter Tests, and Final Exam. The grading scale and the process for calculating the course grades are to be determined by the individual instructors. This information will be included in each instructor’s syllabus.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center in Room 3354 or call (913) 288-7670 V/TDD.