SYLLABUS

DATE OF LAST REVIEW: 02/11/2013

CIP CODE: 47.0604

SEMESTER: Departmental Syllabus

COURSE TITLE: Electrical 3

COURSE NUMBER: AUTT0262

CREDIT HOURS: 5

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, AUTT0261, 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: diagnose open circuit problems; diagnose short circuit problems; diagnose grounded circuit problems; diagnose high resistance problems; identify computer circuit problems using various test equipment; identify current flow on lighting, gauges, warning devices, driver information systems, horns, wiper/washer and accessory circuits on wiring diagrams; diagnose computer circuit problems using test equipment; repair computer circuit problems using test equipment; diagnose CAN/BUS systems; repair CAN/BUS systems; identify low/high voltage circuits and disconnects on hybrid vehicles.
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. Lighting
   A. Headlights and bulbs.
   B. Turn signal and hazard light operation
   C. Aiming headlamps

II. Instruments
   A. Gauges
   B. Gauge sending units
   C. Gauge tester
   D. Speedometer
   E. Information center
   F. Circuit boards
   G. Warning devices

III. Accessories
   A. Horn
   B. Power windows
   C. Power seats
   D. Power mirrors
   E. Power locks
   F. Cruise control
   G. Heated glass
   H. Radio
   I. Security systems
   J. Wiper systems

IV. Circuit problems
   A. Opens
   B. Shorts
   C. High resistance
   D. Intermittent problems
VI. Repair computer circuit problems using test equipment
   A. Oscilloscopes
      1. Waveforms
      2. Amperage
   B. Scantools
   C. Security codes
   D. Body control modules
   E. Vehicle information systems
   F. Supplemental restraint systems
   G. Other modules
      1. ABS
      2. TCS
      3. BCM
      4. Other
   H. Can/Bus systems
   I. Software updates
      1. Reprogramming
V. Hybrid vehicles
   A. Safety
   B. High voltage disconnects
   C. Auxiliary (12v) battery service

EXPECTED LEARNER OUTCOMES:
   A. The student will be able to repair open circuit diagnostics
   B. The student will be able to repair short circuit problems
   C. The student will be able to repair grounded circuit problems
   D. The student will be able to repair high resistance problems
   E. The student will be able to identify computer circuit problems using various test
      equipment
   F. The student will be able to describe current flow on lighting, gauges, warning
      devices, driver information
   G. The student will be able to diagnose computer circuit problems using test
      equipment
   H. The student will be able to repair computer circuit problems using test
      equipment
   I. The student will be able to diagnose CAN/BUS systems
   J. The student will be able to repair CAN/BUS systems
   K. The student will be able to identify low/high voltage circuits and disconnects on
      hybrid vehicles

COURSE COMPETENCIES:
   The student will be able to repair open circuit problems
   1. Locate shorts, grounds, opens, and resistance problems in electrical/electronic
      circuits; determine necessary action
   2. Diagnose the cause of brighter than normal, intermittent, dim, or no light
      operation; determine necessary action
3. Inspect, replace, and aim headlights and bulbs
4. Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action
5. Inspect and test gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action
6. Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action
7. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action
8. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action
9. Diagnose incorrect horn operation; perform necessary action
10. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action
11. Diagnose incorrect washer operation; perform necessary action
12. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action
13. Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action
14. Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action
15. Diagnose incorrect operation of cruise control systems; determine necessary action.
16. Remove and reinstall door panel
   *The student will be able to repair short circuit problems*
17. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action
18. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action
19. Inspect, replace, and aim headlights and bulbs
20. Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action
21. Inspect and test gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action
22. Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action
23. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action
24. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action
25. Diagnose incorrect horn operation; perform necessary action
26. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action
27. Diagnose incorrect washer operation; perform necessary action
28. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action
29. diagnose incorrect heated glass, mirror, or seat operation; determine necessary action
30. Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action
31. Diagnose incorrect operation of cruise control systems; determine necessary action
32. Remove and reinstall door panel
   The student will be able to repair grounded circuit problems
33. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action
34. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action
35. Inspect, replace, and aim headlights and bulbs
36. Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action
37. Inspect and test gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action
38. Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action
39. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action
40. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action
41. Diagnose incorrect horn operation; perform necessary action
42. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action
43. Diagnose incorrect washer operation; perform necessary action
44. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action
45. Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action
46. Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action
47. Diagnose incorrect operation of cruise control systems; determine necessary action.
48. Remove and reinstall door panel
   The student will be able to repair high resistance problems
49. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action
50. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action
51. Inspect, replace, and aim headlights and bulbs
52. Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action
53. Inspect and test gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action
54. Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action  
55. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action  
56. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action  
57. Diagnose incorrect horn operation; perform necessary action  
58. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action  
59. Diagnose incorrect washer operation; perform necessary action  
60. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action  
61. Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action  
62. Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action  
63. Diagnose incorrect operation of cruise control systems; determine necessary action.  
64. Remove and reinstall door pane  

The student will be able to identify computer circuit problems using various test equipment  
65. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action  
66. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action  
67. Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action  
68. Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action  
69. Diagnose incorrect operation of cruise control systems; determine necessary action.  

The student will be able to describe current flow on lighting, gauges, warning devices, driver information systems, horns, wiper/washer and accessory circuits on wiring diagrams  
70. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action  
71. Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action  
72. Inspect and test gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action  
73. Diagnose the cause of incorrect operation of warning devices and other driver Information systems; determine necessary action  
74. Diagnose incorrect horn operation; perform necessary action  
75. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action  
76. Diagnose incorrect washer operation; perform necessary action
77. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action
78. Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action
79. Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action
80. Diagnose incorrect operation of cruise control systems; determine necessary action.

The student will be able to diagnose computer circuit problems using test equipment

81. Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs
82. Repair wiring harness (including CAN/BUS systems)
83. Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry following battery disconnect
84. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action
85. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action
86. Diagnose supplemental restraint system (SRS) concerns; determine necessary action
87. Disarm and enable the airbag system for vehicle service
88. Diagnose radio static and weak, intermittent, or no radio reception; determine necessary action
89. Diagnose body electronic system circuits using a scan tool; determine necessary action
90. Diagnose the cause of false, intermittent, or no operation of anti-theft system
91. Describe the operation of keyless entry/remote-start systems
92. Perform software transfers, software updates, or flash reprogramming on electronic modules

The student will be able to repair computer circuit problems using test equipment

93. Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs
94. Identify location of hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures
95. Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry following battery disconnect
96. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action
97. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action
98. Diagnose supplemental restraint system (SRS) concerns; determine necessary action
99. Disarm and enable the airbag system for vehicle service
100. Diagnose body electronic system circuits using a scan tool; determine necessary action
101. Diagnose the cause of false, intermittent, or no operation of anti-theft system
102. Describe the operation of keyless entry/remote-start systems
103. Perform software transfers, software updates, or flash reprogramming on electronic modules
   The student will be able to diagnose CAN/BUS systems
104. Identify high voltage circuits of electric or hybrid electric vehicle and related safety precautions
105. Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures Repair wiring harness (including CAN/BUS systems)
106. Check for module communication (including CAN/BUS systems) errors using a scan tool
   The student will be able to repair CAN/BUS systems
107. Repair wiring harness (including CAN/BUS systems)
108. Check for module communication (including CAN/BUS systems) errors using a scan tool
   The student will be able to identify low/high voltage circuits and disconnects on hybrid vehicles
109. Identify location of hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures
110. Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures

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.