**BARTON COMMUNITY COLLEGE**

**COURSE SYLLABUS**

# **GENERAL COURSE INFORMATION**

Course Number: AUTO

Course Title: Steering and Suspension II

Credit Hours: 2

Prerequisite: Steering and Suspension I

Division/Discipline: Workforce Training and Economic Development/Automotive Technology

Course Description: In this course students will explore suspension and steering theory, and perform maintenance and service of suspension and steering systems.

Kansas Board of Regents Program Alignment Date: March 10, 2014

1. **INSTRUCTOR INFORMATION**

# **COLLEGE POLICIES**

Students and faculty of Barton Community College constitute a special community engaged in the process of education. The College assumes that its students and faculty will demonstrate a code of personal honor that is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom.

Plagiarism on any academic endeavors at Barton Community College will not be tolerated. The student is responsible for learning the rules of, and avoiding instances of, intentional or unintentional plagiarism. Information about academic integrity is located in the Student Handbook.

The College reserves the right to suspend a student for conduct that is determined to be detrimental to the College educational endeavors as outlined in the College Catalog, Student Handbook, and College Policy & Procedure Manual. (Most up-to-date documents are available on the College webpage).

Any student seeking an accommodation under the provisions of the Americans with Disability Act (ADA) is to notify Student Support Services via email at disabilityservices@bartonccc.edu.

# **COURSE AS VIEWED IN THE TOTAL CURRICULUM**

Steering and Suspension II is the second in a series of two courses, pertaining to the service of the Steering and Suspension systems.

# **ASSESSMENT OF STUDENT LEARNING**

Barton Community College is committed to the assessment of student learning and to quality education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton, as a learning college, in finding ways to improve student learning.

Course Outcomes, Competencies, and Supplemental Competencies:

1. Demonstrate a knowledge of general suspension and steering systems
2. Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.
3. Identify and interpret suspension and steering system concerns; determine necessary action.
4. Analyze, diagnose and repair suspension and steering services
5. Disable and enable supplemental restraint system (SRS).
6. Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).
7. Diagnosis steering column noises, looseness, and binding concerns (including tilt mechanisms); determine necessary action.
8. Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine necessary action.
9. Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine necessary action.
10. Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action.
11. Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets.
12. Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots; replace as needed.
13. Determine proper power steering fluid type; inspect fluid level and condition.
14. Flush, fill, and bleed power steering system.
15. Inspect for power steering fluid leakage; determine necessary action.
16. Remove, inspect, replace, and adjust power steering pump drive belt.
17. Remove and reinstall power steering pump.
18. Remove and reinstall press fit power steering pump pulley, check pulley and belt alignment.
19. Inspect and replace power steering hoses and fittings,
20. Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper.
21. Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps.
22. Test and diagnose components of electronically-controlled steering systems using a scan tool; determine necessary action.
23. Identify hybrid vehicle power steering system electrical circuits and safety precautions.
24. Inspect electric power-assisted steering.
25. Diagnose and repair suspension systems
26. Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine necessary action.
27. Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine necessary action.
28. Inspect, remove, and install upper and lower control arms, bushings, shafts, and rebound bumpers.
29. Inspect, remove and install strut rods and bushings.
30. Inspect, remove and install upper and/or lower ball joints (with or without wear indicators).
31. Inspect, remove and install steering knuckle assemblies.
32. Inspect, remove and install short and long arm suspension system coil springs and spring insulators.
33. Inspect, remove and install torsion bars and mounts.
34. Inspect, remove and install front stabilizer bar (sway bar) bushings, brackets, and links.
35. Inspect, remove and install strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.
36. Inspect, remove and install track bar, strut rods/radius arms, and related mounts and bushings.
37. Inspect rear suspension system leaf spring(s), bushings, center pins/bolts, and mounts.
38. Diagnose and repair suspension and steering services
39. Inspect, remove, and replace shock absorbers; inspect mounts and bushings.
40. Remove, inspect, and service or replace front and rear wheel bearings.
41. Describe the function of the power steering pressure switch.
42. Diagnosis, adjustment, and repair wheel alignment
43. Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine necessary action.
44. Perform pre-alignment inspection and measure vehicle ride height; perform necessary action.
45. Check toe-out-on-turns (turning radius); determine necessary action.
46. Check SAI (steering axis inclination) and included angle; determine necessary action.
47. Check rear wheel thrust angle; determine necessary action.
48. Check for front wheel setback; determine necessary action.
49. Check front and rear cradle (sub frame) alignment; determine necessary action.
50. Reset steering angle sensor.
51. Diagnosis and repair wheels and tires
52. Inspect tire condition, identify tire wear patterns, check for correct tire sizes and application (load and speed ratings) and adjust air pressure, determine necessary action.
53. Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action.
54. Rotate tires according to manufacturer’s recommendations.
55. Measure wheel, tire, axle flange, hub run out; determine necessary action.
56. Diagnose tire pull problems; determine necessary action.
57. Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly (static and dynamic).
58. Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.
59. Inspect tire and wheel assembly for air loss; perform necessary action.
60. Repair tire using internal patch.
61. Identify and test tire pressure monitoring system (indirect and direct) for operation;
62. Calibrate system; verify operation of instrument panel lamps.
63. Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system.
64. **INSTRUCTOR'S EXPECTATIONS OF STUDENTS IN CLASS**

# **TEXTBOOKS AND OTHER REQUIRED MATERIALS**

1. **REFERENCES**

# **METHODS OF INSTRUCTION AND EVALUATION**

# **ATTENDANCE REQUIREMENTS**

# **COURSE OUTLINE**