



## AUTOMOTIVE SUSPENSION SYSTEMS — AUTM 1023

### A. Course Description

- **Credits:** 3.00
- **Lecture Hours/Week:** 1.00
- **Lab Hours/Week:** 2.00
- **OJT Hours/Week:** 0
- **Prerequisites:** None
- **Corequisites:** None
- **MnTC Goals:** None

This course teaches suspension systems using leaf springs, coil springs, McPherson struts, and torsion bars. Steering systems using manual and power rack and pinion, recirculating ball steering gears. Alignment angles and their relationship to vehicle handling.

Prerequisites: AUTM 1003 and 1013

### B. Course Effective Dates: 8/21/17 – Present

### C. Outline of Major Content Areas

As noted on course syllabus

### D. Learning Outcomes

1. Adjust manual or power non-rack-and-pinion worm bearing preload and sector lash
2. Check SAI (steering axis inclination) and included angle; determine necessary action
3. Check and adjust caster; perform necessary action
4. Check and adjust front and rear wheel camber; perform necessary action
5. Check and adjust front wheel toe and center steering wheel
6. Check and adjust rear wheel toe
7. Check and adjust suspension and steering components to obtain proper alignment specifications
8. Check for front wheel setback; determine necessary action
9. Check front cradle (subframe) alignment; determine necessary action
10. Check rear wheel thrust angle; determine necessary action
11. Check toe-out-on-turns (turning radius); determine necessary action
12. Complete work order to include customer information vehicle identifying information, customer concern, related service history, cause, and correction
13. Determine proper power steering fluid type; inspect fluid level and condition

14. Diagnose and adjust components of electronically controlled steering systems using a scan tool; determine necessary action
15. Diagnose power steering fluid leakage; determine necessary action
16. Diagnose power steering gear (non-rack-and-pinion) binding, uneven turning effort, looseness, hard steering, noises, and fluid leakage concerns; determine necessary action
17. Diagnose power steering gear (rack-and-pinion) binding, uneven turning effort, looseness, hard steering, and fluid leakage concerns; determine necessary action
18. Diagnose power steering related concerns and perform necessary action
19. Diagnose short and long arm suspension system noises, body sway, and uneven riding height concerns; determine necessary action
20. Diagnose steering column noises, looseness, and binding concerns (including tilt mechanisms); determine necessary action
21. Diagnose strut suspension system noises, body sway, and uneven riding height concerns; determine necessary action
22. Diagnose tire related concerns and determine necessary action
23. Disable and enable supplemental restraint system (SRS)
24. Identify and interpret suspension and steering concern; determine necessary action
25. Identify hybrid vehicle power steering system electrical circuits, service and safety precautions
26. Inspect, diagnose, and calibrate tire pressure monitoring system
27. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals)
28. Measure wheel, tire, axle, and hub runout; determine necessary action
29. Perform pre-alignment inspection; perform necessary action
30. Perform tire and wheel service and repairs
31. Research applicable vehicle and service information, such as suspension and steering system operation, vehicle service history, service precautions, and technical service bulletins
32. Service. remove, inspect, and install steering and suspension related components
33. Test and diagnose components of electronically controlled suspension systems using a scan tool; determine necessary action

**E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

**F. Learner Outcomes Assessment**

As noted on course syllabus

**G. Special Information**

None noted

