



**COWLEY COLLEGE  
& Area Vocational Technical School**

**COURSE PROCEDURE FOR**

**SUSPENSION/STEERING SYSTEMS II  
AMS3138 2 Credit Hours**

**Student Level:**

This course is open to students on the college level in either the freshman or sophomore year and to area high school vocational students.

**Catalog Description:**

**AMS 3138 - SUSPENSION/STEERING SYSTEMS II (2 hrs)**

This course will enable the student to gain basic understanding and hands on experience utilizing industry standard procedures in the diagnosing and repair of Suspension and Steering Systems. Topics presented throughout the course cover; steering systems, suspension systems, wheels, tires, and alignment concerns.

**Prerequisites:**

AMS3136-Suspension/ Steering Systems I

**Controlling Purpose:**

This course is designed to help the student increase their knowledge concerning entry-level skills contained in the sequenced competencies, for success, after graduation from the Automotive Technology Program.

**Learner Outcomes:**

Upon completion of this course the student will be able to analyze and diagnose related problems specific to automotive suspension/steering systems.

**Units Outcomes and Criterion Based Evaluation Key for Core Content:**

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.

- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

<b>UNIT 1: General Suspension and Steering Systems Diagnosis</b>						
Outcomes: The student will gain an understanding of general steering and suspension.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify and interpret suspension and steering concern; determine necessary action.
						Locate and interpret vehicle and component identification numbers (VIN, vehicle cert. labels, calibration decals).

## UNIT 2: Steering Systems Diagnosis and Repair

Outcomes: The student will demonstrate an understanding of diagnosis of SRS systems and steering column repair.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Disable and enable supplement restraint systems (SRS).
						Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).
						Diagnose steering column noises, looseness, and binding concerns (including tilt mechanisms); determine necessary action.
						Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and fluid leakage concerns; determine necessary action.
						Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and fluid leakage concerns; determine necessary action.
						Adjust manual or power non-rack and pinion worm bearing preload and sector lash.
						Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action.
						Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets.
						Remove and reinstall power steering pump.
						Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment.

### UNIT 3: Front Suspension

Outcomes: The student will gain knowledge of front suspension and common repair procedures.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Diagnose short and long arm suspension system noises, body sway, and uneven riding height concerns; determine necessary action.
						Diagnose strut suspension system noises, body sway, and uneven riding height concerns; determine necessary action.
						Remove, inspect, and install upper and lower control arms, bushings, shafts, and rebound bumpers.
						Remove, inspect and install strut rods (compression/tension) and bushings.
						Remove, inspect, and install upper and/or lower ball joints.
						Remove, inspect and install steering knuckle assemblies.
						Remove, inspect, and install short and long arm suspension systems coil springs and spring insulators.
						Remove, inspect, install, and adjust suspension system torsion bars; inspect mounts.
						Remove, inspect, and install stabilizer bar bushings, brackets, and links.
						Remove, inspect, and install strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.
						Lubricate suspension and steering systems.

**UNIT 4: Rear Suspension**

Outcomes: The student will gain the knowledge of rear suspension and common repair procedures.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Remove, inspect, and install coil springs and spring insulators.
						Remove, inspect, and install transverse links, control arms, bushings, and mounts.
						Remove, inspect, and install leaf springs, leaf spring insulators (silencers), shackles, brackets, bushings, and mounts.

**UNIT 5: Miscellaneous Service**

Outcomes: The student will gain the knowledge to inspect, service, and replace shocks and strut-assemblies.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Remove, inspect, and service or replace front and rear wheel bearings.
						Test and diagnose components of electronically controlled suspension systems using a scan tool; determine necessary action.
						Remove, inspect, and install strut cartridge or assembly, strut coil spring, and insulators (silencers).
						Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps.
						Test and diagnose components of electronically-controlled steering systems using a scan tool; determine necessary action.
						Describe the function of the power steering pressure switch.

**UNIT 6: Miscellaneous (Wheel Bearings, Parking Brakes, Electrical, etc.) Diagnosis and Repair.**

Outcomes: The student will gain the knowledge and ability to diagnose and repair tire wear due to loose or defective suspension parts.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Differentiate between steering and suspension concerns using principles of steering geometry (caster, camber, toe, etc.).
						Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine necessary action.
						Perform pre-alignment inspection; perform necessary action.
						Measure vehicle riding height; determine necessary action.
						Check and adjust front and rear wheel chamber; perform necessary action.
						Check and adjust caster; perform necessary action.
						Check and adjust front wheel toe; adjust as needed.
						Center steering wheel.
						Check toe-out-on-turns (turning radius); determine necessary action.
						Check SAI (steering axis inclination) and included angle; determine necessary action.
						Check and adjust rear wheel toe.
						Check rear wheel thrust angle; determine necessary action.
						Check for front wheel setback; determine necessary action.
						Check front cradle (sub-frame) alignment; determine necessary action.

**Projects Required:**

As assigned

**Textbook:**

Contact Bookstore for current textbook.

**Materials/Equipment Required:**

Students are required to furnish their own Personal Protection Equipment i.e. Safety Glasses.

**Attendance Policy:**

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

**Grading Policy:**

The grading policy will be outlined by the instructor in the course syllabus.

**Maximum class size:**

Based on classroom occupancy

**Course Timeframe:**

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

**Refer to the following policies:**

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

**Disability Services Program:**

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability, which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.