



AUTOMOTIVE STEERING AND SUSPENSION FUNDAMENTALS (II)

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Course Syllabus

Course Number:	SS102	Instructor:	Ron Rader
OCAS Code:		Phone Number:	580-327-0344
Course Length:	75 hours	Email:	rrader@nwtech.edu
Career Cluster:	Transportation	Campus:	Alva, OK
Career Pathway:	Automotive Service	Program:	Automotive Service Technology
Career Major:	Automotive Service Technician, Automotive Chassis Technician, Automotive Maintenance Light Repair Technician		
Pre-requisite:	Automotive Introduction, Automotive Steering and Suspension Introduction		
Course Description:	This course includes steering system diagnosis and repair or replacement operations, including the power steering pump, tie rod ends, pitman arms, relay rods and steering dampeners. Also covered will be front and rear suspension systems diagnosis and repair, including inspecting and replacement of components. Students will also learn to perform wheel alignments and how to diagnose wheel alignment issues.		
Instructional Philosophy:	To provide a training program that is of merit both educationally and ethically while effectively providing the individual learner the opportunities, knowledge and skills necessary to succeed in the workplace as well as life.		
Course Goals:	Upon successful completion of this course, the student will be able to:		
	Competencies:		
	Steering Systems Diagnosis and Repair		
	Flush, fill, and bleed power steering system		
	Remove, inspect, and replace power steering pump, mounts, seals, and gaskets		
	Remove, inspect, and replace power steering pump pulley; check alignment		
	Inspect and replace pitman arm, relay (center link/intermediate) rod, idler arm and mountings, and steering linkage damper		
	Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps		
	Suspension Systems Diagnosis and Repair		
	Front Suspension		
	Diagnose short and long arm suspension system noises, body sway, and uneven riding height concerns; determine necessary action		
	Diagnose MacPherson 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, install, and adjust strut (compression/tension) rods and bushings.		
	Remove, inspect, and install upper and lower ball joints on short and long arm suspension systems.		
	Remove, inspect, and install steering knuckle assemblies.		
	Remove, inspect, and install short and long arm suspension system 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 MacPherson strut cartridge or assembly, strut coil spring,		

insulators (silencers), and upper strut bearing mount.

Rear Suspension

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.

Remove, inspect, and install MacPherson strut cartridge or assembly, strut coil spring, and insulators (silencers).

Wheel Alignment Diagnosis, Adjustment, and Repair

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 camber; 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

Wheel and Tire Diagnosis and Repair

Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action

Measure wheel, tire, axle, and hub run-out; determine necessary action

Diagnose tire pull (lead) problem; determine necessary action

Major Course Projects:

Students will perform tasks relating to the Automotive Service Industry as per standards identified by the National Automotive Technicians Education Foundation (NATEF).

Project Outline:

Students will complete repair orders each day and will document completion of competencies on competency profiles tracking individual progress and accomplishment. Projects will include performing tasks on mock ups, shop vehicles, and live work as student skills progress. These projects will reinforce classroom theory instruction and will require the student to consult industry service information during the course of task performance.

Instructional Delivery Plan:

The instruction for this course will be comprised of multiple methods designed to promote and accommodate different learning styles including classroom lecture, classroom demonstrations, shop demonstrations, hands on learning activities, classroom discussion, interactive media, textbook, computer based learning activities, research projects, guest speakers, student presentations, and interactive learning with CPS (Classroom Performance System). Students will be required to practice the skills associated with the instructional content and will be required to work independently and also in teams. Assignments will require students to use academic skills in math, science, and language arts.

Assessment Plan:

Students will be assessed according to three basic kinds of learning. Knowledge: Does the student possess the required knowledge to perform a specific competency? Skills: Does the student possess the necessary coordination to perform the task/competency?

Attitude: Will the student perform the task/competency on the job after learning to do it? Students will also be assessed according to the basic work skills of attendance and promptness. Soft skills will be assessed in the Academic Career Center.

50%	Daily work- Performance of technical skills on job, work habits, safety, clean-up, participation
50%	Written assignment- Repair orders, textbook assignments, etc.

Grading Scale:

A	90-100	Exceeds expectations
B	80-89	Meets industry standards and expectations
C	70-79	Passing grade, but does not meet some standards
D	60-69	Passing, but only meets the minimum standards
F	Below 60	Failing, does not meet minimum standards

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Alliance Credit Offered:

Industry Alignments: ASE Certification, ODCTE Certification,

End of Instruction Industry Assessment: ASE Certification, ODCTE Certification,

Resources: Automotive Excellence Vol. 1 and Vol. 2
Modern Automotive Technology
Introduction to Automotive Service: Fundamental Concepts
CDX Global Interactive Training
Snap On Shop Key
Alldata

Attachments: See Automotive Service Technology Task List Competency Handbook