ASSIGNMENT 4.13A: Information about the University

The University of Northwestern-OK (NU) is a private, Christian liberal arts college located in Ada, Oklahoma. It was founded in 1908 and is affiliated with the Church of the Nazarene. The university offers a wide range of undergraduate and graduate programs across various disciplines. The university is committed to providing a quality education that integrates faith and learning. NU is accredited by the Higher Learning Commission and is a member of the Council for Higher Education Accreditation.

Course Title: AUTOMOTIVE STEERING AND SUSPENSION FUNDAMENTALS (II)

Course Syllabus

Course Number: SS102
Instructor: Ron Rader
Phone Number: 580-327-0344

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). 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

Alliance Credit Offered:
OSU Okmulgee

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