



# AUTOMOTIVE ENGINE REPAIR FUNDAMENTALS (II) Course Syllabus

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<b>Course Number:</b>	ER102	<b>Instructor:</b>	Ron Rader
<b>OCAS Code:</b>		<b>Phone Number:</b>	580-327-0344
<b>Course Length:</b>	45 hours	<b>Email:</b>	rrader@nwtech.edu
<b>Career Cluster:</b>	Transportation	<b>Campus:</b>	Alva, OK
<b>Career Pathway:</b>	Automotive Service	<b>Program:</b>	Automotive Service Technology
<b>Career Major:</b>	Automotive Service Technician, Automotive Drivability Technician		
<b>Pre-requisite:</b>	Automotive Introduction, Automotive Engine Repair Introduction		
<b>Course Description:</b>	In this course the student will learn general engine vacuum tests and to perform general cylinder tests and determine necessary action. Students will cover gaskets and seals on pans and covers, an how to prime the lubrication system. Students will also learn to perform oil pressure tests, as well as to test and replace thermostats, water pumps, radiators and fan clutches. Students will also learn to inspect test and replace oil and water sending units and switches.		
<b>Instructional Philosophy:</b>	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.		
<b>Course Goals:</b>	Upon successful completion of this course, the student will be able to:		
	<b>Competencies:</b>		
	<b>General Engine Diagnosis</b>		
	Verify and interpret engine concern; determine necessary action.		
	Perform engine vacuum tests; determine necessary action.		
	Perform cylinder power balance tests; determine necessary action.		
	Perform cylinder compression tests; determine necessary action.		
	Perform cylinder leakage tests; determine necessary action.		
	<b>Cylinder Head and Valve Train Diagnosis and Repair</b>		
	Adjust valves (mechanical or hydraulic lifters).		
	Inspect camshaft drives (including gear wear and backlash, sprocket and chain wear); replace as necessary.		
	Inspect and replace timing belt(s), overhead camdrive sprockets, and tensioners; check belt tension; adjust as necessary.		
	Inspect camshaft for run-out, journal wear and lobe wear.		
	Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine necessary action.		
	Verify camshaft(s) timing according to manufacturer's specifications and procedure.		
	<b>Engine Block Assembly Diagnosis and Repair</b>		
	Inspect and replace pans, covers, gaskets, and seals.		
	Inspect internal and external threads; restore as needed (includes installing thread inserts).		
	Prime engine lubrication system.		
	<b>Lubrication and Cooling Systems Diagnosis and Repair</b>		
	Perform oil pressure tests; determine necessary action.		
	Inspect, test, and replace thermostat and housing.		

Inspect, test, remove, and replace water pump.  
 Remove and replace radiator.  
 Inspect, and test fans(s) (electrical or mechanical), fan clutch, fan shroud, and air dams.  
 Inspect auxiliary oil coolers; replace as needed.  
 Inspect, test, and replace oil temperature and pressure switches and sensors.

**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

**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