

COURSE SYLLABUS

AUMT 1419 (4:2:8)

AUTOMOTIVE ENGINE REPAIR

Automotive Service Technology

Industrial Technology Department

Technical Education Division

Levelland Campus

SOUTH PLAINS COLLEGE

SCANS COMPETENCIES

- C-1 TIME--Selects goal--relevant activities, ranks them, allocates time, and prepares and follows schedules.
- C-2 MONEY--Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
- C-3 MATERIALS & FACILITIES-Acquires, stores, allocates, and uses materials or space efficiently.
- C-4 HUMAN RESOURCES--Assesses skills and distributes work accordingly, evaluates performances and provides feedback.
- INFORMATION--Acquires and Uses Information
- C-5 Acquires and evaluates information.
- C-6 Organizes and maintains information.
- C-7 Interprets and communicates information.
- C-8 Uses computers to Process information.
- INTERPERSONAL--Works With Others
- C-9 Participates as members of a team and contributes to group effort.
- C-10 Teaches others new skills.
- C-11 Serves clients/customers--works to satisfy customer's expectations.
- C-12 Exercises leadership--communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
- C-13 Negotiates-Works toward agreements involving exchanges of resources resolves divergent interests.
- C-14 Works with Diversity-Works well with men and women from diverse backgrounds.
- SYSTEMS--Understands Complex Interrelationships
- C-15 Understands Systems--Knows how social, organizational, and technological systems work and operates effectively with them
- C-16 Monitors and Correct Performance-Distinguishes trends, predicts impacts on system operations, diagnoses systems' performance and corrects malfunctions.
- C-17 Improves or Designs Systems-Suggests modifications to existing systems and develops new or alternative systems to improve performance.
- TECHNOLOGY--Works with a variety of technologies
- C-18 Selects Technology--Chooses procedures, tools, or equipment including computers and related technologies.
- C-19 Applies Technology to Task-Understands overall intent and proper procedures for setup and operation of equipment.
- C-20 Maintains and Troubleshoots Equipment-Prevents, identifies, or solves problems with equipment, including computers and other technologies.

FOUNDATION SKILLS

- BASIC SKILLS--Reads, writes, performs arithmetic and mathematical operations, listens and speaks
- F-1 Reading--locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
- F-2 Writing-Communicates thoughts, ideas, information and messages in writing, and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
- F-3 Arithmetic--Performs basic computations; uses basic numerical concepts such as whole numbers, etc.
- F-4 Mathematics--Approaches practical problems by choosing appropriately from a variety of mathematical techniques.
- F-5 Listening--Receives, attends to, interprets, and responds to verbal messages and other cues.
- F-6 Speaking--Organizes ideas and communicates orally.
- THINKING SKILLS--Thinks creatively, makes decisions, solves problems, visualizes, and knows how to learn and reason
- F-7 Creative Thinking--Generates new ideas.
- F-8 Decision-Making--Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.
- F-9 Problem Solving--Recognizes problems and devises and implements plan of action.
- F-10 Seeing Things in the Mind's Eye--Organizes and processes symbols, pictures, graphs, objects, and other information.
- F-11 Knowing How to Learn--Uses efficient learning techniques to acquire and apply new knowledge and skills.
- F-12 Reasoning--Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.
- PERSONAL QUALITIES--Displays responsibility, self-esteem, sociability, self-management, integrity and honesty
- F-13 Responsibility--Exerts a high level of effort and preservers towards goal attainment.
- F-14 Self-Esteem--Believes in own self-worth and maintains a positive view of self.
- F-15 Sociability--Demonstrates understanding, friendliness, adaptability, empathy, and politeness in-group settings.
- F-16 Self-Management--Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.
- F-17 Integrity/Honesty--Chooses ethical courses of action.

COURSE SYLLABUS

COURSE TITLE: AUTOMOTIVE ENGINE REPAIR AUMT 1419 (4:2:8)
INSTRUCTOR: Gary Ham
OFFICE LOCATION AND PHONE/E-MAIL: Auto \ Diesel Building- office 1
(806) 894-9611 ext. 2296 gham@southplainscollege.edu
OFFICE HOURS: 7:30 to 8:00 AM and 2:30 to 4:00 PM.

SOUTH PLAINS COLLEGE IMPROVES EACH STUDENT'S LIFE

I. GENERAL COURSE INFORMATION:

- A. Course Description: This is a study of the fundamentals of engine operation, diagnosis and repair. It includes lubrication systems and cooling systems. Emphasis is placed upon the overhauling of selected engines, identification and inspection, measurements, and disassembly, repair, and re-assembly of the engine. Safety procedures are emphasized throughout the course. Elements of the course may be taught manufacturer specific.
- B. Course Learning Outcomes: Utilizing appropriate safety procedures, the student will demonstrate engine diagnostic procedures. The student will perform cylinder head, valve train, engine block, and lubrication and cooling systems diagnosis and repair.
- C. Course Competencies: Upon completion of this course the student must demonstrate the following competencies:
1. Demonstrate safety precautions while using tools and equipment.
 2. Demonstrate the techniques of engine operation and construction.
 3. Demonstrate preliminary diagnosis of mechanical problems.
 4. Demonstrate engine removal, disassembly, cleaning and inspection.
 5. Demonstrate diagnostic procedures of mechanical problems.
 6. Demonstrate complete cylinder block assembly including crankshaft, bearings, connecting rods, and pistons.
 7. Demonstrate camshaft operations and timing.
 8. Demonstrate cylinder head, intake, and exhaust manifold operations.
 9. Demonstrate understanding of cooling and lubrication systems.
 10. Demonstrate engine repair, construction, and re-assembly.
 11. Perform starting procedures, possible no-start conditions, compression tests, and cylinder balance and leakage tests.
 12. Perform theoretical horsepower and torque curve read-outs from computer simulated dynamometer.

- D. Academic Integrity: (See current college catalog for policy)
- E. SCANS and Foundation Skills: C-1 through C-20 and F-1 through F-17 See back of cover page
- F. Verification of Workplace Competencies: Capstone experience is offered as a comprehensive written, oral or hands-on exit exam during the last course of the program.

II. **SPECIFIC COURSE/INSTRUCTOR REQUIREMENTS:**

- A. Textbook and Other Materials: Today's Technician "*Automotive Engine Repair and Rebuilding*", by Elisabeth H. Dorries, 3rd Edition. Students are required to possess a basic tool set for the program by the 12th class day.
- B. Attendance Policy: Whenever absences become excessive and, in the instructor's opinion, minimum course objectives cannot be met due to absences, the student should be withdrawn from the course. In addition, an instructor is required to notify the Office of Student Services when the student has missed every class day during any 14 consecutive calendar-day period, excluding holidays.

When an unavoidable reason for class absence arises, such as illness, an official trip authorized by the college or an official activity, the instructor may permit the student to make up work missed. It is the student's responsibility to complete work missed within a reasonable period of time as determined by the instructor.

Students are officially enrolled in all courses in which they pay tuition and fees at the time of registration. Should a student, for any reason, delay in reporting to class after official enrollment, absences will be attributed to the student from the first meeting of the class.

A student who does not attend a class and does not officially withdraw from that course by the 12th class day in a regular semester or by the 4th class day in a summer session should be administratively withdrawn from that course and receive a grade of "X" or "F" as determined by the instructor. Instructors are responsible by clearly stating their administrative drop policy in the course syllabus, and it is the student's responsibility to be aware of that policy.

Regular attendance is required. Roll will be checked at the beginning of each class and after lunch. Absences will affect the final grade as follows:

- fourth absence (4th), final grade may be lowered 5 points from initial grade.
- fifth absence (5th), final grade may be lowered an additional 5 points (10 points from initial grade)
- sixth absence (6th), final grade may be lowered an additional 5 points (15 points from initial grade)

Three (3) tardies will equal 1 absence. On the 6th absence, you may be automatically dropped from both courses. (AUMT 1306 and AUMT 1419). If the excessive absence occurs after the official drop date at the end of the semester, a grade of "F" will be issued.

Since this course is to be taken concurrently with AUMT 1306, tardies and absences will be applied to both courses.

- C. Assignment Policy: Class assignments and/or homework may be given at the instructor's discretion. Homework and other assignments are due on time. Late work will not be accepted. If you are late for an exam, you will not be allowed to take the exam and will receive a grade of zero on that exam. Students are expected to complete all assignments. When assigned to a lab competency, the student is expected to stay with the project until completion.
- D. Grading Policy/Procedure and/or methods of evaluation: There are three categories taken into consideration when computing the final semester grades. The percentages below will be calculated based on points given for completion of the following objectives:
1. Attitude objectives: 20 %
 2. Skills objectives: 50%
 3. Knowledge objectives: 30%

Clean-up will be part of skills objectives grade. You will be expected to maintain a clean and safe work area at all times. A complete lab area cleanup will be performed at the end of the semester.

There are four levels of attainable grades in the Automotive Service Technology program. This grading policy follows industry standards used in ASE certification testing. The levels are:

- A (90 and above)
- B (80 to 89)
- C (70 to 79)
- F (69 and below)

- E. Special Requirements: The student must pass a series of comprehensive exit exams related to the main competencies covered in the automotive courses. The exams shall be administered during the last semester of the program.
- Safety Exam: The student must pass a safety exam with a score of 100 to continue lab assignments per NATEF standard 6.8C.

HAZARDOUS MATERIALS

Students will come in contact with chemicals and other materials, which come under the "HAZARDOUS MATERIALS" classification as defined by Title 83, Article 5182b of the Hazard Communication Act. Material Safety Data Sheets (MSDS) information will be posted outside of office number 1. Warning signs are posted throughout the Auto/Diesel building and all appropriate personal protective equipment will be provided, which the student must use. Safety information will be given and demonstrated in class before safety quizzes and test.

III. COURSE OUTLINE:

1. Safety
Safety precautions of tools and equipment, techniques of engine operation and construction
2. Theory of Engine Operation
Identify engine components, engine operations: how components relate to other components, identify different types of engine designs
3. Engine Operating Systems
Identify engine cooling system components, cooling system operations, identify lubrication system components, lubrication system operations
4. General Engine Diagnostics
Identify procedures for preliminary diagnosis, mechanical operations for preliminary diagnostic procedures, explanations of how preliminary diagnosis aids in diagnostic procedures, mechanical operations for diagnostic procedures
5. Engine Materials, Sealers, Gaskets, and Fasteners
Engine materials, crack repair, gaskets, seals, and sealant
6. Special Tools and Machinery
Identify and explain engine measuring tools, use of special reconditioning and hand tools
7. Engines: Removal and Disassembly
Identify engine components, complete engine disassembly, complete cleaning process, identify and explain inspection procedures
8. Manifolds and Cylinder Heads
Identify cylinder head components and operations, cylinder head assembly; identify intake and exhaust components, manifold assembly procedures
9. Reconditioning Cylinder Heads
Resurfacing the cylinder head, valve guide and seat reconditioning, reconditioning valve train components, cylinder head disassembly and re-assembly
10. The Valve Train
Valve timing, identify and explain valve train components, camshaft degree procedures
11. Cylinder Block Assembly
Identify crankshaft related components, and explain assembly procedures, identify piston and connecting rod related components, and explain assembly procedures, balancing and blueprinting, camshaft and timing operations
12. Engine re-assembly and installation
Engine operation, engine repair procedures, and engine assembly procedures

IV. ACCOMMODATIONS:

1. See "Equal opportunity" statement in the South Plains College catalog.
2. See "Services for Students with Disabilities" statement in the South Plains College catalog.
3. See "Special Services" statement in the South Plains College catalog.