Automotive Compression Ignition Engines & Fuel Systems

Class
AUMT 2302

This course is a study of the diagnosis and repair of modern light-duty automotive compression ignition engines and related systems. Topics include the use of advanced engine performance diagnostic equipment. Elements of the course may be taught manufacturer-specific.

Upon course completion, the student will be able to 1) explain the operating principles of compression-ignition (CI) engines, including fuel, air induction, exhaust, and emission control systems, 2) diagnose CI engine systems, and 3) perform service and repair procedures of CI engines including, fuel system, fuel quality, air induction, exhaust, and emission control systems.

STUDENT BEHAVIOR/CLASSROOM DECORUM: Students are encouraged to discuss, inquire, and express their thoughts and views during class. Classroom behavior that interferes with either the instructor's ability to conduct the class or the ability of students to benefit from the instruction is not acceptable. Students are required to turn off all cell phones or similar electronic devices (or place them on silent mode) before coming into the classroom. The instructor reserves the right to assign no credit for work on that day if a student talks or texts on a cell phone or similar electronic device. The classroom is not a place for children, and students are not to bring their family members into the classroom.

NETIQUETTE POLICY: This term is used to describe accepted, proper behavior on the Internet. Remember the following when communicating online (messages, discussion board, etc.):

- Never post profanity, racist, or sexist messages
- Be respectful of fellow students and instructors
- Never insult any person or their message content
- Never plagiarize or publish intellectual property
- Do not use text messaging abbreviations or slang
- Do not type in all CAPS (this is considered online yelling)

PROGRAM DRESS CODE:

Your appearance in the program must model industry expectations on a daily basis. The entire dress code will be covered during safety training. The following items are the minimum requirements for this course:

1. Belt, if required, to hold your pants up; should not have a metal buckle
2. No loose-fitting clothing
3. No wallet chains, keys, cell phone holders
4. Remove jewelry
5. Tie long hair back or keep it under a shop-type cap
6. Appropriate work boots/shoes are recommended

If you are caught without safety glasses, you will lose your daily points for the day as your first warning (you will not be allowed in the shop). On the second warning, you will be dismissed from class for that day. On the third warning, you will have to report to the Dean to discuss why you are not complying with this important safety rule.

Course Length
16, 8, and 5 week term offerings
Course Learning Objectives

Upon completion of this course, the student must demonstrate the following competencies:

1. The student must also be able to utilize allocated time prudently in the completion of the assigned task.

2. Demonstrate proper use of manuals and computer equipment to retrieve repair information to properly complete a task.

3. Accomplish within a group, tasks requiring various skills and completion in the most efficient manner.

4. Demonstrate the ability to serve the industry by listening to the customer's explanation of what is happening with their vehicle and demonstrate the ability to use established methods to operate equipment.

Required Textbooks

Today's Technician: Basic Automotive Service and Systems, Classroom Manual and Shop Manual 6th edition

By Chris Hadfield, John Witthauer

E-book included with Cengage Unlimited subscription, required for all AUMT courses.

SUPPLIES AND EQUIPMENT: Tool list to be provided by the instructor.

COPYRIGHT POLICY: Unless a student has obtained permission from the copyright holder, it is a violation of Copyright Law to print or photocopy chapters from a textbook that the student did not purchase. If the course requires the use of an electronic textbook, a student must look for a statement that allows for photocopying and/or printing of the eTextbook.

Evaluation Standards

Periodic tests, both objective and skill-based, allow the student to demonstrate their level of achievement in each competency.

Student success is measured by assessment techniques aligned to course goals and learning outcomes. A variety of techniques may be used, including but not limited to objective exams, written reports, performance charts, portfolios, oral presentations or demonstrations, and group projects. Individual faculty members are responsible for designing evaluation instruments to measure student mastery of course goals and learning outcomes and for indicating the nature of such instruments in the instructor's class requirements.

A student shall retain all rights to work created as part of instruction or using College District technology resources.

GRADING REQUIREMENTS:

30% Labsheet assignment completion

25% Skills test including final skills test

20% Written tests, including a final exam

10% Quizzes, including pop quizzes

5% Assignments, including e-learning modules, review questions, etc.

5% Participation in class and lab (affected by absences)

5% Properly following safety procedures and proper clean up of lab area

Written Tests: Acceptable written evaluations shall be completed with a minimum score of; 80% or higher. Safety-related written tests may require a higher score for mastery, and curriculum-specified best practices will be followed.

Performance Evaluations: Acceptable and safe completion of performance evaluations will be determined by the instructor according to accepted industry standards and the specified criteria. Performance evaluations meeting minimum industry standards will earn a grade of 70% (C or Satisfactory). Those exceeding "minimum" acceptance standards may earn higher grades subject to the instructors' approval. Students not meeting minimum acceptance standards must repeat each unacceptable performance evaluation until minimum skills are achieved. Students

unable to meet minimum acceptance standards may be assigned an "F" grade for any incomplete competencies. However, all specified competencies MUST be completed to receive credit for this course, and any incomplete competencies may result in an "F" in the course.

Supplemental evaluations may include safe practices, student participation, quizzes, time management, workplace skills, and other instructor-specified content.

Absences

ATTENDANCE POLICY: It is the student's responsibility to maintain regular contact with instructors. Class attendance is the responsibility of the student. All students must be officially enrolled in any course that they attend. It is expected that students attend all classes and be on time. If an absence occurs, it is the responsibility of the student to make up examinations, obtain lecture notes, and otherwise compensate for what may have been missed. Students who stop attending class and do not officially drop, withdraw, or resign from the college may receive a grade of "F" for all coursework missed. Absences affect performance in this course and do not reflect well on participation. No student may substitute the attendance of another student.

Students should frequently check Canvas (Learning Management System) for notifications and updates to the course. Students are expected to use the online resources provided by WC to:

1. Track course assignments and progress

2. Discuss topics and issues with fellow students

3. Turn in assignments, quizzes, and tests

4. Check for any updates, changes or alterations to the course

5. Access all course materials to include presentations, assignments, quizzes, and tests.

Instructional Methods

Lecture, demonstrations, lab experiences.

Disabilities

ADA Statement:

Any student with a documented disability (e.g. learning, psychiatric, vision, hearing, etc.) may contact the Office on the Weatherford College Weatherford Campus to request reasonable accommodations. *Phone:* 817-598-6350 *Office Location:* Office Number 118 in the Student Services Building, upper floor. *Physical Address:* Weatherford College 225 College Park Drive Weatherford, TX.

Academic Integrity
Academic Integrity is fundamental to the educational mission of Weatherford College, and the College expects its students to maintain high standards of personal and scholarly conduct. Academic dishonesty of any kind will not be tolerated. Academic dishonesty includes, but is not limited to, cheating on an examination or other academic work, plagiarism, collusion, and the abuse of resource materials including unauthorized use of Generative AI. Departments may adopt discipline specific guidelines on Generative AI usage approved by the instructional dean. Any student who is demonstrated to have engaged in any of these activities will be subject to immediate disciplinary action in accordance with institutional procedures.
Program Learning Outcomes

Upon completion of the program, graduates will be able to:

- Perform tasks to diagnose and repair components of electrical/electronic systems, and heating, ventilation and air conditioning systems.
- Perform tasks to diagnose and repair automotive engine and power train systems.
- Perform tasks to diagnose and repair components of automotive suspension and steering systems.

- Perform tasks to diagnose and repair components of hydraulic, and anti-lock brake systems.

SCANS

The Secretary's Commission on Achieving

Necessary Skills (SCANS) identified competencies in the areas of Resources, Interpersonal, Information, Systems, and Technology; and foundation skills in the areas of Basic Skills and Personal Qualities. This course is part of a program in which each of these competencies and skills are integrated.

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, and 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, predict 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.