

Automotive Technology/Diesel

COURSE OUTLINE

1. **Course Title:** Automotive Technology/Diesel
2. **CBEDS Title:** Automotive mechanics, combination
3. **CBEDS Number:** 5655
4. **Job Titles:**

Automotive Service Technicians & Mechanic
Diesel Service Technicians & Mechanic
Heavy Vehicle & Mobile Equipment Service Technicians & Mechanic
Industrial Machinery Installation, Repair and Maintenance Worker
Precision Instrument & Equipment Repairer
Rail Transportation Technician & Mechanic
Small Engine Mechanic
Stationary Engineer and Boiler Operator

5. Course Description:

This course stresses the basic jobs, operations, and skills needed in the servicing and repair of automobiles and trucks. The student will gain a thorough knowledge of the materials and equipment used by auto mechanics. He will learn to use meters and measuring instruments; learn to interpret sketches, schematics and diagrams; and use shop manuals and other source materials.

Each student will have an opportunity to use the hand tools of the automotive trade and to learn how to perform the operations of the trade, including the evaluation of the completed work. The student will have shop experiences not only in the mastery of manipulative skills but also related information or technology. Under the direction of the shop instructor, the student will learn related information in order that he may have a complete understanding of why he performs the operations of the trade in certain ways.

The course will include related subjects consisting of mathematics, science and drawing related to the automotive trade. Here emphasis will be placed on the mastery of fundamental concepts and principles as well as the ability to solve practical problems. Those related subjects will help to provide the foundation, which makes the shop meaningful and functional.

It is expected that the student will have sufficient knowledge of the trade to enable him to enter into satisfactory employment upon completion of the course.

Student Outcomes and Objectives:

1. To gain insight into the opportunities of the auto mechanics trade
2. To become acquainted with the major and minor components of an automobile.
3. To learn the correct procedures of starting and completing an automotive job and the proper tools and equipment to use in these procedures
4. To develop an understanding of the methods, materials, and other related technology of the auto mechanics trade
5. To learn how to use manuals, schematics, and sketches
6. To develop good judgment and sound repair practice

7. To coordinate acquired skills for purposes of testing, diagnosing, and troubleshooting
8. To learn the use of specialized equipment
9. To learn to accept responsibility
10. To learn the related trade information needed for a complete understanding of repair and servicing operations
11. To gain entry-level knowledge and skills needed for job placement in the automotive or diesel fields

Pathway

Recommended Sequence	Courses
Introductory	Automotive Technology 1, 2
Skill Building	Automotive Technology 3, 4
Advanced Skill	Advanced Automotive Technology 5, 6

6. Hours: *Students receive up to 180 hours of classroom instruction.*

7. Prerequisites: None

8. Date (of creation/revision): July 2010

9. Course Outline

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Upon successful completion of this course, students will be able to demonstrate the following skills necessary for entry-level employment.				
Instructional Units and Competencies	Course Hours	Model Curr. Standards	CA Academic Content Standards	CAHSEE
<p>I. CAREER PREPARATION STANDARDS</p> <p>A. Career Planning and Management.</p> <ol style="list-style-type: none"> 1. Know the personal qualifications, interests, aptitudes, knowledge, and skills necessary to succeed in careers. <ol style="list-style-type: none"> a. Students will identify skills needed for job success b. Students will identify the education and experience required for moving along a career ladder. 2. Understand the scope of career opportunities and know the requirements for education, training, and licensure. <ol style="list-style-type: none"> a. Students will describe how to find a job. b. Students will select two jobs in the field and map out a timeline for completing education and/or licensing requirements. 3. Develop a career plan that is designed to reflect career interests, pathways, and postsecondary options. <ol style="list-style-type: none"> a. Students will conduct a self—assessment and explain how professional qualifications affect career choices. 4. Understand the role and function of professional organizations, industry associations, and organized labor in a productive society. <ol style="list-style-type: none"> a. Contact two professional organization and identify the steps to become a member. 5. Understand the past, present and future trends that affect careers, such as technological developments and societal trends, and the resulting need for lifelong learning. <ol style="list-style-type: none"> a. Students will describe careers in the transportation industry sector. b. Students will identify work-related cultural differences to prepare for a global workplace. 6. Know the main strategies for self-promotion in the hiring process, such as completing job applications, resume writing, interviewing skills, and preparing a portfolio. <ol style="list-style-type: none"> a. Students will write and key a resume, cover letters, thank you letters, and job applications. b. Students will participate in mock job interviews. <p>B. Technology.</p> <ol style="list-style-type: none"> 1. Understand past, present and future technological advances as they relate to a chosen pathway. 2. Understand the use of technological resources to gain access to, manipulate, and produce information, products and services. 3. Understand the influence of current and emerging technology on selected segments of the economy. 4. Use appropriate technology in the chosen career pathway. <p>C. Problem solving and Critical Thinking.</p> <ol style="list-style-type: none"> 1. Apply appropriate problem-solving strategies and critical thinking to work-related issues and tasks. 2. Understand the systematic problem-solving models that incorporate input, process, outcome and feedback components. 	<p>10</p> <p>Additional hours are integrated throughout the course.</p>	<p>Transportation Industry Sector, Model Curriculum Standards</p> <p>3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0</p>	<p><u>Language Arts</u> (8) R 1.3, 2.6 W1.3, 2.5, LC 1.4,1.5 1.6 LS1.2, 1.3, (9/10) R2.1,2.3,2 W2.5 LC1.4 LS 1.1, 2.3 (11/12) R2.3 W2.5 LC1.2 <u>Math</u> (7) NS1.2, 1.7 MR 1.1,1.3 2.7,2.8, 3.1</p>	<p>Lang. Arts R 8.2.1 (9/10) R 2.1, 2.3 W2.5 Math (7) NS 1.2, 1.3, 1.7 MR 1.1, 2.1, 3.1</p>

<ul style="list-style-type: none"> 3. Use critical thinking skills to make informed decisions and solve problems. 4. Apply decision-making skills to achieve balance in the multiple roles of personal, home, work and community life. <p>D. Health and Safety.</p> <ul style="list-style-type: none"> 1. Know policies, procedures, and regulations regarding health and safety in the workplace, including employers' and employees' responsibilities. 2. Understand critical elements of health and safety practices related to storing, cleaning and maintaining tools, equipment, and supplies. <p>E. Responsibility & Flexibility.</p> <ul style="list-style-type: none"> 1. Understand the qualities and behaviors that constitute a positive and professional work demeanor. 2. Understand the importance of accountability and responsibility in fulfilling personal, community, and workplace roles. 3. Understand the need to adapt to varied roles and responsibilities. 4. Understand that individual actions can affect the larger community. <p>F. Ethics and Legal Responsibilities</p> <ul style="list-style-type: none"> 1. Know the major local, district, state, and federal regulatory agencies and entities that affect the industry and how they enforce laws and regulations. 2. Understand the concept and application of ethical and legal behavior consistent with workplace standards. <ul style="list-style-type: none"> a. Contact a business and obtain a copy of their rules for employment. b. Role play difference ethical scenarios. 3. Understand the role of personal integrity and ethical behavior in the workplace. <p>G. Leadership and Teamwork.</p> <ul style="list-style-type: none"> 1. Understand the characteristics and benefits of teamwork, leadership, citizenship in the school, community, and workplace settings. 2. Understand the ways in which professional associations, such as SkillsUSA, ASE, NATEF, and competitive career development activities enhance academic skills, career choices, and contribute to promote employability. 3. Understand how to organize and structure work individually and in teams for effective performance and attainment of goals. 4. Know multiple approaches to conflict resolution and their appropriateness for a variety of situations in the workplace. 5. Understand how to interact with others in ways that demonstrate respect for individual and cultural differences and for the attitudes and feelings of others. 				
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Instructional Units and Competencies	Hours	Model Curr. Standards.	CA Academic Standards	CAHSEE
1 Orientation A. ROP goals B. Certificates C. Placement	5	Transportation Industry Sector Vehicle Maintenance Service & Repair Pathway C1.0, 1.2, 1.5 C2.1, 2.4, 2.7 C3.0, 3.2 C6.4	ELA 9-10; LS; 1.1 & 1.6 S. 8; 5c	M 7; MG; 2.4
1. Safety A. Eye B. Tools C. Equipment D. Cleaning Solutions	5			
2. Flammable Material A. Types of material B. Safety with Flammable Material C. Precautions with Hazardous material	5			
3. Engine Construction A. Classification B. Theory C. Parts D. Operation of parts	10			
4. Measuring Tools A. How to measure in 32nds, 16ths, 8ths, and 64ths of an inch B. Micrometers—reading in 0-1, 1-2, 2-3, 3-4, and 4-5 C. Dial indicators reading in .001 of an inch and .0005 of an inch D. Feeler gauges, plug gauges in thousandths E. Calipers reading in .001 of an inch F. Care and use of equipment	15			
5. Fuel System/Exhaust System A. Theory B. Parts C. Inspections D. Adjustments	15			
6. Lubrication System A. Theory B. Parts C. Oil classification D. Oil ratings E. Minor lubrication service	15			
7. Cooling System A. Theory B. Parts C. Types of Anti-freezes D. Minor cooling system service	15			

Instructional Units and Competencies	Hours	Model Curr. Standards.	CA Academic Standards	CAHSEE
8. Batteries A. Theory B. Parts C. Charging D. Types	5	Vehicle Maintenance Service & Repair Pathway C3.5 C7.2, 7.3 C8.0, 8.2, 8.3, 8.4	S. 9-12; Physics; 5a, b, c S. 9-12; Physics; 1.d, f, g 2 f	M. 7; MG; 1.2, 1.3, 2.4
9. Electrical Systems A. Theory B. Ohms Law C. Electrical Equipment D. Minor electrical service	10			
10. Starting/Charging Systems A. Theory on starting and charging systems B. Parts of starting and charging systems C. Minor troubleshooting of systems D. Minor system repair	10			
11. Ignition System A. Theory B. Parts of the standard ignition system C. Parts of the electronic ignition system D. Parts of the computer controlled system E. Minor service of the ignition system	5			
12. Clutches A. Theory B. Parts C. Operation D. Minor service repair	5			
13. Driveshaft/Differential A. Theory of driveshaft B. Parts C. Minor service D. Theory on differential E. Parts	10			
14. Suspension/Steering/Tires A. Theory B. Parts C. Types D. Minor service of the suspension, steering, and tires	15			
15. Brakes A. Theory B. Parts C. Types D. Minor service of brakes	10			

Instructional Units and Competencies	Hours	Model Curr. Standards.	CA Academic Standards	CAHSEE
16. Industry Standard Documentation A. "Write It Right" B. Basic customer service 1. Communication 2. Dealing with difficult customers 3. Telephone etiquette 4. Attitude C. Estimates 1. Using the Labor Rate Guide 2. Understanding and applying parts price breaks D. Sales 1. Techniques 2. Closing the sale E. Shop Management 1. Maintaining a productive shop 2. Managing technicians 3. Safety	15	Vehicle Maintenance Service & Repair Pathway C7.2	1.1M (1.2), (1.3), (2.1) 2.0C 2.1 (2.1), (2.6) 2.0C 2.3 (1.4) 2.0 C 2.4 (2.4), (1.8) 6.0 H&S 6.1	(10)Wa 1.1 (8)R2.1 (10)WS 1.2 (7)NS1. 2, 1.3, 1.6, 1.7

10. Additional recommended/optional items

a. Articulation: None

b. Academic credit: None

c. Instructional strategies:

 Methods of Instruction:

- a. Lecture
- b. Audio Visual Materials
- c. Research Readings and Written Presentations
- d. Homework Assignments
- e. Demonstrations
- f. Group & Individual Projects
- g. Quizzes, Tests, Performance Evaluations & Final Exam
- h. Guest Speakers
- i. Internet Exploration

d. Instructional materials: Write It Right: A Guide for Automotive Repair Dealers. Bureau of Automotive Repair, California Department of Consumer Affairs, Sacramento, CA.

e. Certificates: None