AUTOMOTIVE TECHNOLOGY (CBE)

ATCBE 99
INTRODUCTION TO BASIC AUTOMOTIVE SERVICE: SHOP SAFETY (CBE)
1 UNIT

Grade Only
Lecture 1 hour
Offered: ALL
Automotive Shop Safety is a comprehensive module that integrates core safety principles with personal ethics and workplace soft skills. Through theoretical learning and hands-on training, students gain expertise in hazard identification, tool usage, and emergency response procedures. By emphasizing the importance of personal integrity and fostering communication and teamwork skills, this module equips students to prioritize safety and contribute positively to a respectful and collaborative workplace culture.

ATCBE 101
INTRODUCTION TO BASIC AUTOMOTIVE SERVICE (CBE)
3 UNITS

Grade Only
Recommended Concurrent Enrollment: ATCBE 102, ATCBE 109, ATCBE 110, ATCBE 130, or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This module introduces students to the fundamentals of using automotive tools and shop equipment, along with basic vehicle service procedures. The emphasis is on classroom instruction to provide practical "how-to" knowledge, with a strong focus on hands-on lab activities to ensure students master these essential skills.

ATCBE 102
AUTOMOTIVE SCIENCE AND BASIC MECHANICS (CBE)
3 UNITS

Grade Only
Recommended Concurrent Enrollment: ATCBE 101, ATCBE 109, ATCBE 110, ATCBE 130, or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This module offers comprehensive insights into the field of automotive science and technology, establishing a solid foundation for a well-informed "diagnostics" approach. It covers not only technical aspects but also includes soft skills, customer service, and legal considerations in automotive repair. All practical lab activities are directly connected to the classroom discussions, reinforcing the theoretical knowledge presented.

ATCBE 109
AUTOMOTIVE BRAKING SYSTEMS (CBE)
3 UNITS

Grade Only
Recommended Concurrent Enrollment: ATCBE 101, ATCBE 102, ATCBE 110, and ATCBE 130, or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This module introduces students to the theory and fundamental principles of brake systems, emphasizing inspection and repair techniques. It provides hands-on experience with drum brakes, disc brakes, power brakes, and wheel bearing service and repair. The module is designed to prepare students for both the California State Brake License and the national Automotive Service Excellence (ASE) Exam A5, ensuring they are well-equipped with the knowledge and skills required for these certifications.

ATCBE 110
AUTOMOTIVE SUSPENSION, ALIGNMENT, AND STEERING (CBE)
3 UNITS

Grade Only
Recommended Concurrent Enrollment: ATCBE 101, ATCBE 102, ATCBE 109, and ATCBE 130, or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This module provides an introduction to the theory and core principles of automotive steering and suspension systems, with a focus on inspections and repairs. It places significant emphasis on practical hands-on experience, covering steering, suspension, tires, and wheel bearings. The inspection and repair processes are carried out using a computerized four-wheel alignment rack. The module is designed to prepare students for the Automotive Service Excellence (ASE) Test A4, ensuring they are well-prepared to meet the certification requirements.

ATCBE 120
ENGINE PERFORMANCE I (CBE)
3 UNITS

Grade Only
Recommended Concurrent Enrollment: ATCBE 130 or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
The Engine Performance module trains students to diagnose, service, and repair modern engine systems using diagnostic tools, scan software, and hands-on testing. They analyze DTCs, assess engine components, troubleshoot ignition and control systems, and perform module reprogramming. Through real-world applications, students gain the expertise to optimize engine performance and resolve driveability concerns.

ATCBE 130
AUTOMOTIVE BASIC ELECTRICAL SYSTEMS (CBE)
3 UNITS

Grade Only
Recommended Concurrent Enrollment: ATCBE 101, ATCBE 102, ATCBE 109, ATCBE 110, or equivalent.
Prerequisite: AT CBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This module provides students with the foundational knowledge and hands-on skills required to diagnose, test, and repair electrical and electronic circuits in automotive systems. Students will apply principles of electricity, including Ohm's Law, to analyze series, parallel, and series-parallel circuits. Proper use of a digital multimeter (DMM) will be emphasized for measuring voltage, current, and resistance, along with the identification and troubleshooting of common circuit issues such as shorts, grounds, opens, and excessive resistance. Students will utilize wiring diagrams, test lights, and fused jumper wires to diagnose electrical faults accurately. Additionally, the module covers battery testing and service, starter and charging system diagnostics, and the use of advanced tools such as oscilloscopes and graphing multimeters. Hands-on exercises will reinforce the inspection, repair, and replacement of key electrical components, including fuses, relays, solenoids, connectors, and wiring harnesses. By the end of the module, students will be able to systematically diagnose and resolve electrical and starting system faults, ensuring proper vehicle operation.

ATCBE 131
AUTOMOTIVE HEATING, COOLING, AND AIR CONDITIONING (CBE)
3 UNITS

Grade Only
Recommended Preparation: ATCBE 130 or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This module equips students with the skills to diagnose, service, and repair automotive HVAC systems. Students will identify system components, retrieve and interpret diagnostic codes, and perform A/C system performance tests. Hands-on training includes leak detection, refrigerant identification, and proper recovery and recycling procedures. Students will diagnose and repair compressors, condensers, evaporators, expansion valves, and related components while troubleshooting airflow, temperature control, and system protection devices. Emphasis is placed on testing engine cooling system components affecting HVAC operation and addressing common issues like odors, airflow restrictions, and control malfunctions. By the end, students will be proficient in ensuring optimal HVAC system performance.

ATCBE 140
ENGINE REPAIR (CBE)
3 UNITS

Grade Only
Recommended Preparation: ATCBE 101 and ATCBE 102 or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This competency module provides an introduction to the theory and fundamental principles of automotive engine systems, focusing on inspections and repairs. Competencies in this module place a strong emphasis on hands-on practical experience, including engine disassembly and assembly, servicing, and repairs. The goal of the module is to prepare students for the Automotive Service Excellence (ASE) Test A1, ensuring they are well prepared to meet the certification requirements for engine system knowledge and skills.

ATCBE 220
ENGINE PERFORMANCE II (CBE)
3 UNITS

Grade Only
Recommended Preparation: ATCBE 130, ATCBE 230 or equivalaent.
Prerequisite: ATCBE 99, ATCBE 120 or equivalent.
Lecture 3 hours
Offered: ALL
This module equips students with the skills to identify, inspect, service, and diagnose fuel, air induction, and exhaust system components. Students will test fuel quality, pressure, and delivery, address vacuum leaks, and inspect and replace fuel injectors. They will verify idle speed, diagnose back-pressure and turbocharger issues, and evaluate emission control systems, including PCV, EGR, catalytic converters, and EVAP systems. Hands-on activities include performing system inspections, interpreting diagnostic trouble codes (DTCs), and servicing critical components to enhance engine performance, emissions compliance, and overall drivability.

ATCBE 230
AUTOMOTIVE ADVANCED ELECTRICAL SYSTEMS (CBE)
3 UNITS

Grade Only
Recommended Preparation: ATCBE 101, ATCBE 102 or equivalent.
Prerequisite: ATCBE 99, ATCBE 130 or equivalent.
Lecture 3 hours
Offered: ALL
This module provides hands-on training in diagnosing and repairing advanced automotive electrical and electronic systems. Students will analyze automatic idle-stop/start systems, troubleshoot lighting components, and verify instrument panel gauges and warning systems. The module covers vehicle access and security features, including door panel removal, anti-theft systems, remote entry, and starter/fuel disable circuits. Supplemental restraint systems will be examined for proper disabling, enabling, and indicator lamp functionality. Windshield wiper and washer operation, maintenance, and replacement are also addressed. Students will explore entertainment and safety systems, including radios, navigation, amplifiers, speakers, airbags, seat belt pretensioners, collision avoidance, parking assist, and backup cameras. Training extends to body electronic circuits, using scan tools to diagnose communication errors within data bus systems. With real-world applications and diagnostic exercises, this module equips students with industry-relevant skills to service modern automotive electrical systems effectively.

ATCBE 234
AUTOMATIC TRANSMISSIONS AND TRANSAXLES (CBE)
3 UNITS

Grade Only
Recommended Preparation: ATCBE 101 and ATCBE 102, ATCBE 130 or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This module provides an introduction to the theory and core principles of automatic transmissions and transaxles, with a strong emphasis on hands-on practical experience, including troubleshooting and rebuilding. It is designed to prepare students for the Automotive Service Excellence (ASE) Test A2, ensuring they acquire the knowledge and skills needed to excel in the field of automatic transmission and transaxle systems.

ATCBE 236
MANUAL TRANSMISSION, TRANSAXLES, AND FINAL DRIVES (CBE)
3 UNITS

Grade Only
Recommended Preparation: ATCBE 101, ATCBE 102, ATCBE 130 or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
This module delves into the theory and fundamental principles of manual drive systems, with a strong focus on hands-on practical experience covering clutches, transmissions, drive shafts, final drives, and transaxles. It also includes comprehensive preparation for the Automotive Service Excellence (ASE) Test A3, ensuring that students are well-equipped to meet the certification requirements in this area of automotive knowledge and expertise.

ATCBE 242
CLEAN AIR CAR (CBE)
3 UNITS

Grade Only
Recommended Preparation: ATCBE 101, ATCBE 102, ATCBE 130, ATCBE 230 or equivalent.
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
The Emission Control and Engine Management module trains students to diagnose and service modern emission systems and computerized engine controls. Using scan tools, they perform active tests, interpret data, and troubleshoot components like secondary air injection, PCV, and EVAP systems. Students learn to identify oil leaks, emissions issues, and driveability concerns, ensuring compliance with environmental regulations and optimal vehicle performance.

ATCBE 247
AUTOMOTIVE EMISSION SYSTEMS AND COMPUTERIZED ENGINE CONTROLS (CBE)
3 UNITS

Grade Only
Recommended Preparation: ATCBE 242 or equivalent; or current ASE certification (A-8).
Prerequisite: ATCBE 99 or equivalent.
Lecture 3 hours
Offered: ALL
The Emission Systems and Exhaust Diagnostics module trains students to diagnose and service emission-related systems, exhaust components, and engine controls. They analyze oil and coolant consumption, assess exhaust characteristics, and inspect fuel, air induction, and exhaust systems, including DEF handling. Students conduct back-pressure tests, diagnose catalytic converter and EGR system issues, and perform hands-on inspections and repairs to ensure compliance with emission standards and optimal vehicle performance.