

SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

AUTO 507B

COURSE TITLE

ADVANCED DRIVEABILITY & PERFORMANCE

TYPE OF COURSE

NON FEE

VOCATIONAL

CATALOG COURSE DESCRIPTION

This course prepares students for basic entry level employment as a driveability and performance technician. Topics include analysis, diagnosis and troubleshooting techniques required to repair computer controlled automotive engine management systems; basic scan tool usage and interpretation; exhaust gas analysis and other related areas. This course will prepare the student for the ASE 8 certification examination. (FT)

LECTURE/LABORATORY HOURS

300

ADVISORY

Valid California Drivers License required to operate vehicles and for employment.
Completion of Auto 507A recommended.

RECOMMENDED SKILL LEVEL

Eighth grade reading level, ability to communicate effectively in the English language and knowledge of general math.

INSTITUTIONAL STUDENT LEARNING OUTCOMES

1. Social Responsibility
SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication
SDCE students demonstrate effective communication skills.

INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking
SDCE students critically process information, make decisions, and solve problems independently or cooperatively.
4. Personal and Professional Development
SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self advocacy skills to cope with changing situations in their lives.

COURSE GOALS

Student Learning Outcomes

1. To provide instruction in the operational theory of and repair procedures for automotive engine control systems and related components.
2. To develop problem solving techniques in order to diagnose engine performance and drivability complaints.
3. To enhance the students' reading, writing, math and communication skills so they may interact successfully with employers and customers.
4. To provide work experience in a simulated work environment representative of those encountered in the automotive repair industry today. This experience will include instruction in common business practices, ethics, and integrity.

COURSE OBJECTIVES

Students will demonstrate through practical applications, written and oral communication skills, their ability to:

1. Apply general safety practices in addition to the specific procedures related to the automotive industry.
2. Analyze, select, and properly use the correct hand and power tools, in addition to diagnostic equipment required to repair today's automobiles.
3. Analyze and demonstrate competence in diagnosing and repairing malfunctions in the gasoline engine and it's electrical, ignition, fuel and emission control systems to NATEF standards.
4. Demonstrate professional ethics, personal integrity, good business practices and customer relation skills, meeting the standards of the California Department of Consumers Affairs.

SECTION II

COURSE CONTENT AND SCOPE

BUSINESS PROCEDURE AND (NATEF A1)
CUSTOMER RELATIONS

The following topics and concepts are presented throughout all modules of this course

COURSE CONTENT AND SCOPE (CONTINUED)

1. Business Conduct and Ethics
2. Repair Orders and Job Scheduling
3. Oral and Written Communications
4. Keyboarding Skills and Computer Literacy Used in this Field

Math review for this course will cover the following areas: addition, subtraction, multiplication and division of whole numbers; fractions and decimals; simple algebraic expressions; the metric system; linear measurements; graphs; ratios; angles; percentages; reading dial gauges; volume measures; liquid measurement; weight and mass.

MODULE I (NATEF A1 - A8) 10 Hrs.

SAFETY

Safety concepts and practices are presented throughout all modules of this course

1. Auto Program Orientation
2. Facilities Orientation
 - 2.1. Safety equipment
 - 2.2. Types
 - 2.3. Locations
3. Common Types of Injuries
 - 3.1. Burns
 - 3.2. Asbestos hazards
 - 3.3. Chemical hazards
 - 3.4. Traffic hazards
4. Tool Safety
 - 4.1. Hand tools
 - 4.2. Electrical tools
 - 4.3. Hydraulic tools
 - 4.4. Pneumatic tools
5. Fire Safety
6. Batteries
 - 6.1. Charging
 - 6.2. Use of jumper cables
7. Hybrid (Electric) Car Safety Requirements
 - 7.1. Service & Maintenance
 - 7.2. High Voltage Disconnects
8. Material Safety Data Sheets (MSDS)

MODULE II (NATEF A8) 80 Hrs.

ENGINE TUNE AND PERFORMANCE

1. Review General Engine Operation & Diagnosis
2. Ignition Systems Introduction, Diagnosis Adjustments and Repair
3. Traditional Fuels and Alternative Fuels, Comparison
4. Fuel Systems Functions, Service, Diagnosis and Repair
5. Dual Fuel & Flexible Fuel, Designs, Operation, Service

COURSE CONTENT AND SCOPE (CONTINUED)

MODULE III (NATEF A6,A7A8) 100 Hrs.
ENGINE ELECTRONICS

1. Electrical Review
2. Engine Electrical Systems Function, Service, Diagnosis and Repair
3. Computerized Engine Controls Function, Diagnosis, and Repair
4. Hybrid Technology, Design, Systems & Performance
5. Modern Batteries & Fuel Cell Technology, Designs and Issues
6. Air Conditioning Overview
7. Refrigerant Recovery Procedures
8. Recharge A/C Systems

MODULE IV (NATEF A8) 110 Hrs.
DRIVEABILITY/EMISSIONS

1. Environmental, Health Concerns & Regulations
 - 1.1. Advantages/Disadvantages of Alternative Fuels
2. Air Induction and Exhaust Systems Function, Diagnosis and Repair
3. Diagnosis of OBD II Onboard Diagnostic Systems
4. Scan Tool Usage

APPROPRIATE READINGS

Students will be given reading assignments from the current required text book. In addition, reading of trade magazines and web articles is recommended.

ATTS: Understanding and Diagnosing Hybrid Vehicles, Jerry Trujia, current edition

WRITING ASSIGNMENTS

Written homework assignments from the text book will include review questions and glossary terms. The instructor may also assign various automotive related reports during the course of the program.

OUTSIDE ASSIGNMENTS

Students are encouraged to visit various repair shops and local new car dealerships in the San Diego County area. The instructor may also require field trips to local automotive related businesses.

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Students will perform analysis and evaluation of reading and/or classroom materials and utilize this analysis in classroom discussions, writing assignments, and in performing laboratory activities. Students must select and use appropriate methods and materials needed to complete laboratory assignments.

EVALUATION

A student's grade will be based on multiple measures of performance. The assessment will measure development of independent critical thinking skills and will include evaluation of the student's ability to:

1. Perform the manipulative skills of the craft, as required, to NATEF standards.
2. Apply theory and safety to laboratory assignments.
3. Perform on written, oral, or practical examinations.
4. Contribute to class discussions.
5. Maintain attendance per current policy.

Satisfactory completion of the course may require completion of a culminating activity, which may include, but is not limited to, one of the following:

1. Written report.
2. Classroom presentation.
3. Research project.
4. Industry involvement.

The culminating activity will require the student to use the new skills that he/she acquired during the course.

The student will receive an evaluation at the end of each module or when requested by student. A letter grade of C or better must be achieved for satisfactory completion.

Upon successful completion of each individual course within the Automotive Technician program a Certificate of Course Completion will be issued. Upon successful completion of all courses included in the program a Certificate of Program Completion will be issued.

METHOD OF INSTRUCTION

Classroom lectures, demonstrations, laboratory, audio-visual presentations, computer assisted instruction, group and individual instruction. Field trips, job shadowing and intern/externships may be utilized.

This course, or sections of this course, may be offered through distance education.

TEXT AND SUPPLIES

Textbooks: *Modern Automotive Technology*, James Duffy, Goodheart-Wilcox, current edition

Software: Engine Performance

Manuals: ENGINE PERFORMANCE TRAINING GUIDE. Product No. 92366. ISBN 1-57932-490-8. Motor Info. Systems www.motor.com 1-800-4A-MOTOR (248)828-0000

Other: Internet access for research of various automotive technical web pages.

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PREPARED BY Edward G. Nugent

DATE AUGUST 15, 2009

REVISED BY Edward G. Nugent

DATE FEBRUARY 18, 2010

REVISED BY Instructional Services/SLO's Added

DATE JUNE 1, 2011

REVISED BY Sam Phu

DATE September 4, 2019

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

REFERENCES:

San Diego Community College District Policy 3100
California Community Colleges, Title 5, Section 55002
Continuing Education Catalog