AUTO 101: FUNDAMENTALS OF AUTOMOTIVE SERVICE, DIAGNOSIS AND REPAIR

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2021
Credits:	6
Total Contact Hours:	150
Lecture Hours :	90
Lab Hours:	60
Hours Arranged:	0
Outside of Class Hours:	180
Strongly Recommended:	ENGL 101.
Transferable to CSU:	Yes
Transferable to UC:	No
Grading Method:	Standard Letter

Catalog Course Description

Intended for automotive majors, this class serves as the prerequisite for all automotive certificate and/or degree-applicable courses. Automobiles and light trucks will be explored from the point of view of the service technician. Scientific principles and operation of essential automotive technologies are central to the course goal of preparing students for entry into the automotive core curriculum. Appropriate lab activities in automobile inspection, service and repair are included. A valid California driver license is required for this course. 90 lecture hours, 60 lab hours.

Course Objectives

- identify and measure a specific metric and standard size bolts.
- understand and interpret volume, temperature, angles, whole numbers, decimals, standard and metric conversions, basic arithmetic operations, order of operation, charts and graphs as it pertains to engines by calculating displacement, static and dynamic compression, torque, horsepower and angular velocity and acceleration.
- understand and interpret angles in a steering and suspension system and line and angle relationships in a chassis and suspension system.
- understand the torque multiplication or reduction in gear ratios in a drive-train using the basic concept of moments of rigid bodies in algebraic terms and concepts of ratio and proportion.
- understand the concept of percent and apply it to repair order cost and pricing calculations.
- measure outside dimensions, inside dimensions, radial runout, or endplay on specific automotive components using the appropriate measuring instrument.
- successfully lift a vehicle on an automotive hoist using the recommended lifting points in a safe and appropriate manner.
- write a repair order with all the necessary information completed in a timely manner.
- identify specific hand tools correctly.
- retrieve service information from a computer-based Automotive Information Database.
- identify various automotive fluids, their level and condition on a given automotive vehicle.
- perform basic service on a given automotive vehicle using the proper tools, equipment and procedures.
- understand and interpret numerical place value, whole numbers, decimals, fractions, mixed numbers unit conversion and angles when using precession measuring tools such as dial indicators, vernier calipers, micrometers and torque wrenches.

Major Course Content

1. Industry Exposure
   a. Organizations
      i. Technician credentialing and licensing
      ii. Industry standards
   b. Careers
      i. Salary expectations
      ii. Pay structure
      iii. Skill and physical requirements
   c. Manufacturers
      i. OEM
      ii. Aftermarket
2. Service Equipment Usage, Procedures and Safety
   a. Hand Tools
   b. Vehicle Lifting Apparatus
   c. Pneumatic Tools
   d. Cleaning Equipment
   e. Precision Measuring Tools
   f. Hazardous Materials
   g. Fasteners
   h. Identification
      i. Tool selection
      ii. Repair
      iii. Sealants, gaskets, and seals
3. Service Literature and Vehicle Information
   a. Vehicle Identification Numbers
   b. Vehicle Labels
   c. Specifications
   d. Maintenance Schedules
   e. Technical Service Bulletins
   f. Safety Recalls and Special Service Campaigns
   g. Owner's Manuals
   h. Service and Repair Manuals
   i. Online/Electronic Resources
4. Repair Order Documentation
   a. Write-It-Right
   b. Condition, Cause, and Remedy
5. Automotive Related Science
   a. Friction
   b. Pressure and Vacuum
   c. Motion
   d. Aerodynamics
   e. Energy and Work
   f. Thermodynamics

   g. Basic Chemistry
   h. Basic electricity
6. Preventative Maintenance and Service
   a. Identification, Inspection and Adjustment of Fluid Levels
   b. Fluid Selection, Replacement Intervals and Procedures
   c. Filter Replacement Intervals and Procedures
   d. Belts and Hoses
   e. Tire Pressure and Rotation Methods
   f. Spark Plug Selection and Replacement
   g. Basic Brake Inspection
   h. Basic Battery Inspection

Lab Content

1. Service Equipment Usage
   a. Hand Tools
   b. Vehicle Lifting Apparatus
   c. Pneumatic Tools
   d. Cleaning Equipment
   e. Precision Measuring Tools
   f. Hazardous Materials
   g. Fasteners
      i. Identification
      ii. Tool selection
      iii. Repair
      iv. Sealants, gaskets, and seals
2. Maintenance, Inspection, Service & Repair of the following Automotive Systems
   a. Engines
      i. Oil and Filter
      ii. Belts and Hoses
      iii. Coolant and Thermostat
   b. Fuel & Ignition Systems
      i. Spark Plugs
      ii. Fuel Filter
      iii. Air Filter
   c. Chassis Systems
      i. Tire Pressure and Rotation
      ii. Brake Inspection
   d. Drivetrain
      i. Fluid and Filter Changes
3. Usage of Service Literature and Vehicle Information
4. Repair Order Documentation

Suggested Reading Other Than Required Textbook

Technical articles, journals, or on-line resources related the specific course content.

Examples of Required Writing Assignments

Students will write an essay explaining their specific automotive career goals and what specific skills are required to attain that career goal.

Examples of Outside Assignments

Students will read specific course content related articles, journals, or on-line resource material and provide a written assessment of the content and its value to their continued education in automotive technology.

Instruction Type(s)

Lecture, Lab, Online Education Lecture