

SRJC Catalog Information

Dept and Nbr: AUTO 80

Title: INTRO AUTOMOTIVE TECH

Full Title: Introduction to Automotive Technology

Last Reviewed: 1/27/2014

Units: 3.0

Catalog Description:

Introduction to theory of operation, routine maintenance, technical vocabulary, components, systems, use of basic tools and safety procedures relating to the automobile and the automotive repair technician. Workplace skills covered will include the basic maintenance and repair of the automobile and its systems for the entry level auto maintenance technician.

Recommended Preparation:

Eligibility for ENGL 100 or ESL 100

Course Content

Student Learning Outcomes:

Students will be able to:

1. Demonstrate the correct use of basic tools and safety procedures utilized by an automotive repair technician.
2. Apply with proficiency the basic maintenance procedures and repair operations of the automobile and its systems.

Objectives:

Upon completion of this course, the student will be able to:

1. Apply safety standards and practices in an auto shop environment.
2. State the theory behind the operation of all of the basic systems on an automobile.
3. Describe and identify the components used in those systems.
4. Demonstrate a working knowledge of the basic operation of all major automobile systems.
5. Describe the environmental issues involved with automotive repair and apply appropriate procedures concerning disposal of hazardous material from the automobile when repairing or disposing of the vehicle.
6. Identify and properly use and care for tools and equipment.
7. Identify metric and standard tool sizes and purposes.
8. Discuss the automotive industry and identify related employment opportunities.

Topics and Scope:

1. Automotive Background and Overview
 - a. Careers in the Automotive Service Industry
 - b. Starting a Career in the Automotive Industry
 - c. Working as a Professional Service Technician
 - d. Technician Certification

2. Shop Fundamentals
 - a. Shop Safety
 - b. Environmental and Hazardous Materials
 - c. Fasteners and Thread Repair
 - d. Hand Tools
 - e. Power Tools and Shop Equipment
 - f. Measuring Systems and Tools - English and Metric
 - g. Service Information

3. Engine Fundamentals
 - a. Vehicle Identification and Emission Ratings
 - b. Gasoline Engine Operation
 - c. Diesel Engine Operation
 - d. Engine Lubrication and Cooling Systems
 - e. Under-Hood Inspection
 - f. Vehicle Lifting and Hoisting
 - g. Lube-Oil and Filter Service

4. Electrical Fundamentals
 - a. Electrical Circuits
 - b. Circuit Testers and Digital Meters
 - c. Starting and Charging Systems

5. Electronic Accessories
 - a. Dash Warning Lights and Driver Information Systems
 - b. Lighting Systems
 - c. Safety Belts and Airbag Systems
 - d. Heating and Air Conditioning Systems

6. Electronics, Performance and Emissions
 - a. Gasoline and Alternative Fuels
 - b. Computers and Sensors
 - c. Ignition System
 - d. Fuel-Injection Systems
 - e. Emission Control Devices
 - f. Hybrid Electric Vehicles
 - g. Scan Tools and Diagnostic Procedures

- 7. Brakes and Inspection
 - a. Tires and Wheels
 - b. Brakes and Antilock Braking Systems
 - c. Suspension and Steering Systems

- 8. Drive Line
 - a. Manual Transmissions/Transaxles
 - b. Automatic Transmissions and Transaxles

Representative Assignments:

- 1. Reading, approximately 10 - 25 pages per week.
- 2. Worksheets from reading assignments.
- 3. Notebook with handouts and class notes.
- 4. Lab assignments with worksheets.
- 5. Exams (4 to 8).

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skill and/or require students to select, organize and explain ideas in writing.

Writing 1 - 5%

Notebooks

Problem solving: Assessment tools, *other than exams*, that demonstrate competence in computational or non-computational problem solving skills.

Problem Solving 5 - 10%

Worksheets.

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Skill Demonstrations 10 - 15%

Lab assignments with worksheets.

Exams: All forms of formal testing, *other than skill performance exams*.

Exams 70 - 75%

Exams- 4 to 8

Other: Includes any assessment tools that do not logically fit into the above categories.

Other Category 0 - 5%

Participation.

SRJC Catalog Information

Dept and Nbr: AUTO 125

Title: AUTO HEAT AIR COND
SYST

Full Title: Automotive Heating and Air Conditioning
Systems

Last Reviewed: 9/20/2010

Units: 1.5

Catalog Description:

Theory, service and repair of many types of automotive heating and air conditioning systems. Includes environmental and safety concerns using R-12 and R-134a refrigerants. Engine heating and cooling, manual and automatic system controls will also be introduced. Prepares the student to take the A7 ASE (Automotive Service Excellence) certification exam.

Recommended Preparation:

Eligibility for ENGL 100 or ESL 100

Course Content

Student Learning Outcomes:

Students will be able to:

1. Identify and describe the theory, service and repair of common types of automotive heating and air conditioning systems.
2. Correctly use diagnostic tools to diagnose and repair electrical control systems.
3. Demonstrate the skills necessary to pass the ASE (Automotive Service Excellence) A7, Heating and Air Conditioning Examination.

Objectives:

Upon completion of this course, the student will be able to:

1. Use related tools and equipment safely.
2. Recognize environmental issues and apply standards involved in maintenance and repair of automotive refrigeration systems.
3. Describe the operation of basic automotive heating and refrigeration systems.
4. Identify and describe the components used in automotive heating and refrigeration systems.
5. Inspect and validate individual system components.
6. Diagnose and repair electrical control systems.

7. Correctly use diagnostic tools.
8. Analyze and write the complaint -- cause -- correction of a system failure.
9. Demonstrate the skills necessary to complete the A7 portion of the ASE test series.

Topics and Scope:

1. Principles of the basic refrigeration system and how they apply to any system
2. Temperature and pressure fundamentals
3. Engine cooling systems
4. Manual and automatic comfort systems
5. Systems components
6. Case and duct systems
7. Air conditioning tools used in diagnosing and repairing
8. AC system testing and diagnoses
9. Electrical control systems
10. System service
11. Safety and hazards concerning use of refrigerants
12. Retrofitting R-2 systems to R-134a refrigerants

Representative Assignments:

1. Reading 10 - 25 pages per week
2. Answer the questions at the end of each chapter
3. Participate in classroom discussion
4. List the environmental hazards of using various refrigerants
5. Complete the demonstration worksheet for each classroom discussion
6. Skill demonstrations:
 - a. Employ rules about shop safety
 - b. Locate components used in automobile refrigeration systems

- c. Identify, by touch, the areas of a refrigeration system which should be hot and cold and compare findings with the textbook and class discussions
- d. Make use of a manifold gauge set
- e. Set up a system performance test
- f. Show skill in using diagnostic tools

7. Complete homework problems in handouts

8. Quizzes (2-5) and final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skill and/or require students to select, organize and explain ideas in writing.

Writing
0 - 0%

None

This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Problem solving: Assessment tools, *other than exams*, that demonstrate competence in computational or non-computational problem solving skills.

Problem Solving
5 - 10%

Homework problems

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Skill Demonstrations
10 - 20%

Demo worksheets; skill demonstrations

Exams: All forms of formal testing, *other than skill performance exams*.

Exams
60 - 80%

Exams: multiple choice, true/false, matching items, completion, short answer

Other: Includes any assessment tools that do not logically fit into the above categories.

Other Category
5 - 15%

Attendance and participation

SRJC CATALOG INFORMATION

Discipline and Nbr: IED 190

Title: INDUSTRIAL MATH

Full Title: Industrial Mathematics

Last Reviewed: 5/14/2018

Units: 1.5

Catalog Description:

Concepts of industrial mathematics geared to students pursuing careers in the automotive, diesel, machine tool and welding fields. Includes a study of basic math, fractions, decimals, conversions, fundamental algebraic equations and basic geometry.

Recommended Preparation:

Eligibility for ENGL 100 or ESL 100 and Course Completion of CSKLS 371

COURSE CONTENT

Student Learning Outcomes:

Upon completion of the course, students will be able to:

Employ math and algebraic theories, concepts and skills to applications found in Automotive, Diesel, Machine Tool and Welding Technology.

Objectives:

Upon completion of the course, students will be able to apply the following math skills to the industrial technology field:

1. Analyze and solve whole number and decimal equations
2. Solve fractional equations
3. Convert decimal and fractional numbers
4. Solve equations for English to metric conversions
5. Solve algebraic equations related to the field.

Topics and Scope

I. Basic math operations as related to specific areas of industrial/trade technology. Addition, subtraction, multiplication and division of:

- A. Decimals
- B. Fractions
- C. Graphs and charts

II. Measurement systems and conversions, as related to machine and auto vocations

- A. Decimal and fractional conversions
- B. Metric system
 1. Metric prefixes
 2. Metric Conversion

- C. English to metric conversions
 1. Linear measurements- inches to millimeters
 2. Pressure- pounds per square inch (PSI) to bar
 3. Torque -foot pounds to newton meters
 4. Volume- cubic inches to cubic centimeters
 5. Temperature- Fahrenheit to Celsius

III. Algebraic equations

- A. Ohms law- voltage, resistance, and amperage calculations
- B. Gear ratios- single and multiple gear sets
- C. Hydraulic pressure and force calculations
- D. Percentages

IV. Geometry, as related to engines and hydraulics

- A. Area of squares and circles
- B. Volume of cylinders
- C. Angles

Assignments:

1. Reading 10-20 pages per week
2. 15-20 homework problem-solving assignments
3. 2 to 5 exams (multiple choice, fill in, short answer)

Methods of Evaluation/Basis of Grade.

Writing: Assessment tools that demonstrate writing skill and/or require students to select, organize and explain ideas in writing.	Writing 0 - 0%
None	
This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.	
Problem solving: Assessment tools, <i>other than exams</i> , that demonstrate competence in computational or non-computational problem solving skills.	Problem Solving 20 - 50%
Homework assignments	
Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.	Skill Demonstrations 0 - 0%
None	
Exams: All forms of formal testing, <i>other than skill performance exams</i> .	Exams 50 - 80%
Exams: Multiple choice, fill in, short answer	
Other: Includes any assessment tools that do not logically fit into the above categories.	Other Category 0 - 0%
None	