

# AT R110: INTRODUCTION TO AUTOMOTIVE TECHNOLOGY

## Originator

ptrujillo

## College

Oxnard College

## Discipline (CB01A)

AT - Automotive Technology

## Course Number (CB01B)

R110

## Course Title (CB02)

Introduction to Automotive Technology

## Banner/Short Title

Intro to Auto Technology

## Credit Type

Credit

## Start Term

Fall 2022

## Formerly

AT R010 - Fundamentals of Auto Technology

AT R011 - Foundations of Automotive Technology

## Catalog Course Description

This course is a comprehensive overview of the automobile, basic operation principles and repair procedures. Systems included are ignition, charging, cranking, cooling, fuel, lubrication, brakes, engine operation and front suspension. Students will obtain skills related to, information acquisition and retrieval; writing repair orders and related documents; hardware identification, use and repair; gasket, seal and sealants use; bearing identification & repair; fluid services; wheel & tire service. Outside online safety certifications will be included in the course.

## Taxonomy of Programs (TOP) Code (CB03)

0948.00 - \*Automotive Technology

## Course Credit Status (CB04)

D (Credit - Degree Applicable)

## Course Transfer Status (CB05) (select one only)

B (Transferable to CSU only)

## Course Basic Skills Status (CB08)

N - The Course is Not a Basic Skills Course

## SAM Priority Code (CB09)

C - Clearly Occupational

## Course Cooperative Work Experience Education Status (CB10)

N - Is Not Part of a Cooperative Work Experience Education Program

## Course Classification Status (CB11)

Y - Credit Course

## Educational Assistance Class Instruction (Approved Special Class) (CB13)

N - The Course is Not an Approved Special Class

**Course Prior to Transfer Level (CB21)**

Y - Not Applicable

**Course Noncredit Category (CB22)**

Y - Credit Course

**Funding Agency Category (CB23)**

Y - Not Applicable (Funding Not Used)

**Course Program Status (CB24)**

1 - Program Applicable

**General Education Status (CB25)**

Y - Not Applicable

**Support Course Status (CB26)**

N - Course is not a support course

**Field trips**

May be required

**Grading method**

(L) Letter Graded

**Alternate grading methods**

(E) Credit by exam, license, etc.

**Does this course require an instructional materials fee?**

No

**Repeatable for Credit**

No

**Is this course part of a family?**

No

**Units and Hours**

**Carnegie Unit Override**

No

**In-Class**

**Lecture**

**Minimum Contact/In-Class Lecture Hours**

87.5

**Maximum Contact/In-Class Lecture Hours**

87.5

**Activity**

**Laboratory**

**Minimum Contact/In-Class Laboratory Hours**

52.5

**Maximum Contact/In-Class Laboratory Hours**

52.5

**Total in-Class**

**Total in-Class**

**Total Minimum Contact/In-Class Hours**

140

**Total Maximum Contact/In-Class Hours**

140

**Outside-of-Class**

**Internship/Cooperative Work Experience**

**Paid**

**Unpaid**

**Total Outside-of-Class**

**Total Outside-of-Class**

**Minimum Outside-of-Class Hours**

175

**Maximum Outside-of-Class Hours**

175

**Total Student Learning**

**Total Student Learning**

**Total Minimum Student Learning Hours**

315

**Total Maximum Student Learning Hours**

315

**Minimum Units (CB07)**

6

**Maximum Units (CB06)**

6

**Student Learning Outcomes (CSLOs)**

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

- |   |   |
|---|---|
| 1 | Identify common fractions used in the automotive field and convert them to their decimal equivalent.  |
| 2 | Identify and comprehend environmental safety rules and regulations, in the following areas. Shop safety, personal safety, hazardous material safety, air bag safety, power tools, and typical equipment safety. |
| 3 | Comprehend simple graphing concepts as they apply to automotive diagnosis and repair.   |
| 4 | Understand and reduce common automotive fractions and convert them to their decimal equivalent in keeping with a foundations course.  |

**Course Objectives**

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

- |   |   |
|---|---|
| 1 | Practice proper customer relations.   |
| 2 | Explain the chemistry of combustion.  |
| 3 | Explain the Technician Certification process.   |
| 4 | Identify automotive systems and repair.   |
| 5 | Write about customer relations as they apply to the industry.                                   |
| 6 | Describe preventive maintenance and repair procedures common to domestic and imported vehicles. |
| 7 | Become certified in an industry standard, OSHA approved safety program.                         |

- 8 Complete common automotive measurements.
- 9 Identify and repair common automotive hardware.
- 10 Identify and diagnose common automotive bearings.
- 11 Complete common automotive services to industry standards.
- 12 Understand the proper management of hazardous waste.
- 13 Using the scientific method, determine root causes of high oil pressure.
- 14 Diagnose potential failures in a vehicle charging, starting, and battery system.

## Course Content

### Lecture/Course Content

1. Safety
  - a. Shop Safety
  - b. Fire Prevention and Fire Extinguishers
  - c. Eye Wash Stations
  - d. Dynamometer and Hoist Safety
  - e. Hazardous Waste
  - f. Safety Certification
2. Lubrication System
  - a. Oil Pressure
  - b. Oil Pumps
  - c. Filters, Full-flow and By-pass
  - d. Engine Lubrication Design
3. System Operating Overview Principles
  - a. Engine Operation (Four Stroke)
  - b. Ignition Systems
  - c. Electrical Systems
  - d. Cooling Systems
  - e. Lubrication Systems
  - f. Fuels
  - g. Brakes
  - h. Suspension
4. Fuel Systems
  - a. Fuel Injection
  - b. Carburetion
  - c. Fuel Pump Operation
5. Ignition Systems
  - a. Ignition System Secondary Circuit Components
  - b. Ignition System Primary Circuit Operation
  - c. Ignition Synchronization
  - d. Volts, Ohms, and Amperage
  - e. Circuits
  - f. Computer Control Systems
6. Electrical Charging Systems
  - a. Battery
  - b. Alternators
  - c. Generators
  - d. Regulators
  - e. Diagnostic and Testing
7. Cranking System
  - a. Design Features
  - b. Magnetic Switches
  - c. Solenoid Operation
  - d. Test Procedures
  - e. Starter Types
8. Brake Operation

- a. Hydraulics
- b. Heat and Friction
- c. Conventional Brake Shoe Design
- d. Disc Brake Design
- e. Anti Lock Brake Systems
- 9. Wheel Alignment and Suspension
  - a. Steering Geometry
  - b. Pre-alignment Procedures
  - c. Tire Wearing Angles
  - d. Component Inspection
- 10. Cooling Systems
  - a. Operation
  - b. Temperature and Pressures
  - c. Water Pumps
  - d. Engine Water Jackets
  - e. Radiator
  - f. Testing Procedures
- 11. Tools & equipment
  - a. Hand tools
  - b. Power tools
  - c. Shop equipment
  - d. Test equipment
  - e. Tool purchasing
- 12. Information Systems
  - a. Mitchell Pro-Demand
  - b. Alldata
  - c. Identifix
- 13. Hardware
  - a. Identification
  - b. Proper tightening
  - c. Repair
- 14. Customer Relations
  - a. ASE certification and Customer Service
  - b. Automotive Technician Customer Service Do's and Dont's
  - c. Customer Follow-Up Service
  - d. Laws and regulations
  - e. Documentation

### Laboratory or Activity Content

- 1. Measurement
- 2. Basic electrical
- 3. Tools & equipment
- 4. Mitchell
- 5. ALLDATA
- 6. Identifix
- 7. Hardware & threading
- 8. Repair orders
- 9. Sealants, gaskets & seals
- 10. Bearings
- 11. Oil & filter service
- 12. Tire change & Balance

### Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

- Written expression
- Problem solving exercises
- Skills demonstrations

**Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):**

Group projects  
Individual projects  
Laboratory activities  
Laboratory reports  
Objective exams  
Oral presentations  
Problem-solving exams  
Quizzes  
Skills demonstrations  
Skills tests or practical examinations

## **Instructional Methodology**

**Specify the methods of instruction that may be employed in this course**

Audio-visual presentations  
Case studies  
Class activities  
Class discussions  
Collaborative group work  
Computer-aided presentations  
Demonstrations  
Distance Education  
Field trips  
Guest speakers  
Laboratory activities  
Lecture  
Practica

**Describe specific examples of the methods the instructor will use:**

Lab vehicles for hands on instruction such as removing a tire and wheel, removing tire from the rim, installing new tires, balances the wheels, and torquing the lug nuts to specifications using industry tools.

## **Representative Course Assignments**

### **Writing Assignments**

1. Students will be required to answer questions at the end of each chapter; all tests include essay questions, such as system identification.

### **Critical Thinking Assignments**

1. The students will access the automotive computer information system and reference materials needed in the diagnosis and repair of the automotive system.

### **Reading Assignments**

1. Students will be required to do outside readings in professional journals such as Motor Service Journal and Motor Age Magazine in addition to the textbook assignments and summarize assigned reading topics.

### **Skills Demonstrations**

1. The students will perform role playing to demonstrate proper customer relations skills as expected of an automotive service excellence technician in the industry.

### **Problem-Solving and Other Assignments (if applicable)**

1. Computer information systems will be used to search for specific types of repairs for specific makes and models of vehicles, this information will be detailed in a report and submitted to the instructor for grading.

## **Outside Assignments**

### **Representative Outside Assignments**

1. Students will be required to do outside reading in professional journals such as Motor Service Journal and Motor Age Magazine.
2. Students will be required to answer questions at the end of each chapter.  
All tests will include essay-type questions.

3. Students will be expected to visit internet websites such as the State of California Bureau of Automotive Repair and Department of Consumer Affairs.
4. Students will access SP2.org to complete multiple certifications independently.

## Articulation

### C-ID Descriptor Number

AUTO 110 X

### Status

Approved

### Equivalent Courses at other CCCs

College	Course ID	Course Title	Units
Rio Hondo College	AUTO 107	Introduction to Automotive Light Service	3

**District General Education**

**A. Natural Sciences**

**B. Social and Behavioral Sciences**

**C. Humanities**

**D. Language and Rationality**

**E. Health and Physical Education/Kinesiology**

**F. Ethnic Studies/Gender Studies**

**CSU GE-Breadth**

**Area A: English Language Communication and Critical Thinking**

**Area B: Scientific Inquiry and Quantitative Reasoning**

**Area C: Arts and Humanities**

**Area D: Social Sciences**

**Area E: Lifelong Learning and Self-Development**

**Area F: Ethnic Studies**

**CSU Graduation Requirement in U.S. History, Constitution and American Ideals:**

**IGETC**

**Area 1: English Communication**

**Area 2A: Mathematical Concepts & Quantitative Reasoning**

**Area 3: Arts and Humanities**

**Area 4: Social and Behavioral Sciences**

**Area 5: Physical and Biological Sciences**

**Area 6: Languages Other than English (LOTE)**

**Textbooks and Lab Manuals**

**Resource Type**

Textbook

**Description**

Gillis, T (2015). *Automotive Service* (5 th ). Cengage. 9781305110

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**Resource Type**

Other Instructional Materials

**Description**

Students will be required to read automotive professional journals in addition to the textbook and internet material as a supplement to the course textbook..

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## Library Resources

### Sufficient Library Resources exist

Yes

## Distance Education Addendum

### Definitions

#### Distance Education Modalities

Hybrid (1%–50% online)

### Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

### Regular Effective/Substantive Contact

#### Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Students will research a battery for their subject vehicle, select the correct size, type, and cost and post to canvas. Students will comment on a classmates submission.
Other DE (e.g., recorded lectures)	Instructor will upload a video demonstrating disassembly and reassembly certain vehicle components.
Video Conferencing	Faculty will lead a real time video discussion on proper customer service etiquette and other soft skill with group feedback.

### Examinations

#### Hybrid (1%–50% online) Modality

On campus

Online

### Primary Minimum Qualification

AUTOMOTIVE TECHNOLOGY

### Additional local certifications required

ASE Master Technician

## Review and Approval Dates

### Department Chair

10/03/2019

### Dean

10/03/2019

### Technical Review

10/09/2019

**Curriculum Committee**

10/09/2019

**DTRW-I**

10/10/2019

**Curriculum Committee**

11/13/2019

**Board**

12/17/2019

**CCCCO**

01/09/2020

**Control Number**

CCC000611487

**DOE/accreditation approval date**

MM/DD/YYYY