

# LOS MEDANOS COLLEGE

## ARTICULATION AGREEMENT

DATE DRAFTED: October 4, 2022

VALID ACADEMIC YEAR(S): FA22-SP24

**LMC COURSE: AUTO-110 “Automotive Essential Car Care”**

**HIGH SCHOOL COURSE:** ROP Automotive Technician & Non-ROP Auto Course

**School:** Pittsburg High School

**Address:** 1750 Harbor St, Pittsburg, CA 94565

- A. COLLEGE COURSE DESCRIPTION:** This course is designed to teach the operation and maintenance of modern automobiles. There is an emphasis on the theory of the basic operating systems, including engine, electrical, chassis, and driveline systems. This course is designed for the student seeking a career as an automotive technician as well as the home mechanic or who wants to learn about his or her automobile.
- B. UNITS: 5.5**
- C. PRE-REQUISITES: NA**
- D. HIGH SCHOOL CLASS DESCRIPTION:** Our Automotive Technology course carefully presents the basics first and then details general repair techniques. The outcome is a student well-grounded in the basics and possessing a solid foundation in service and repair that will enable her or him to grasp the meaning of specific repair steps in a service manual. Automotive Technology is divided into thirteen sections (including the eight categories of the ASE testing program) and 80 chapters.

**E. REQUIRED CONTENT FOR ARTICULATION:**

The sections are as follows:

**Section 1—Introduction to Automotive Technology**

Chapters 1–10 introduce students to the “basics” of automotive technology. They contain information on automobile construction and operation, ASE certification, safety, tools, service information, electricity, and vehicle maintenance.

This section gives students the knowledge needed to secure an entry-level job. Students will learn to perform hands-on tasks, such as changing oil, checking vehicle fluids, replacing engine belts, and doing a “grease job.” The information in this section lays the groundwork for later chapters, which provide in-depth coverage of automotive technology.

**Section 2—Engines**

Chapters 11–16 detail the construction and operation of late-model automotive engines. They review the four-stroke cycle, explain the names and locations of major parts, describe design variations, and detail engine size and performance measurements. The information presented in this section will help students pass ASE Test A1, *Engine Repair*. It will also help students prepare for later chapters on engine service and repair.

**Section 3—Computer Systems**

Chapters 17–19 detail the theory and operation of computer systems, explain how to use a scan tool to find troubles in computerized systems, and describe the use of pinpoint tests to verify the basic electrical/electronic faults indicated by the scan tool.

This important section prepares students for almost every other section of the course. This section will also help students pass several ASE certification tests requiring knowledge of computers, sensors, actuators, scan tools, and related topics, including Test A8, *Engine Performance*.

## **Section 4—Fuel Systems**

Chapters 20–27 explain modern fuel systems in detail. Chapters 20 and 21 cover fuels, fuel tanks, fuel pumps, and fuel filters. Chapters 22 and 23 detail the operation and service of electronic fuel injection, the most common type of fuel system. Chapter 24 provides a brief overview of carburetor operation and repair, since millions of these devices are still in use today. The operation and repair of diesel injection, exhaust systems, turbochargers, and superchargers are detailed in Chapters 25–27. The information in this section will help students pass ASE Test A6, *Electrical/Electronic Systems*, and Test A8, *Engine Performance*.

## **Section 5—Electrical Systems**

Chapters 28–37 detail the operation, diagnosis, and repair of the major electrical systems. The section starts with the battery, the source of initial electrical energy, and progresses through the starting, charging, ignition, and other systems.

Chapter 38 details the operation and service of hybrid drive systems. The information in this section will help students pass ASE Test A6, *Electrical/Electronic Systems*.

## **Section 6—Cooling and Lubrication Systems**

Chapters 39–42 detail the operation, construction, diagnosis, and repair of modern cooling and lubrication systems. The information in this section will help students pass ASE Test A1, *Engine Repair*, and Test A8, *Engine Performance*.

## **Section 7—Emission Control Systems**

Chapters 43 and 44 provide the information needed to test and repair emission control systems so that a vehicle operates as cleanly as possible. The detailed information in this section will help students pass ASE Test A8, *Engine Performance*.

## **Section 8—Engine Performance**

Chapters 45–47 describe common engine performance problems, detail their causes, and explain how each can be corrected. This section explains how to use advanced diagnostic tools to find problems in the engine and related systems. The final chapter in this section explains how to tune an engine. The information in this section will help students gain “state-of-the-art” skills needed to succeed as an automotive technician. It will also help students pass ASE Test A8, *Engine Performance*.

## **Section 9—Engine Service and Repair**

Chapters 48–52 will help students gain the skills needed to properly troubleshoot and rebuild automotive engines. Chapter 48 describes engine problems and summarizes repair procedures. Chapter 49 explains how to properly tear down an engine while gathering information about its condition. Chapters 50–52 detail how to measure, inspect, and assemble the parts of an engine. The information in this section will help students pass ASE Test A1, *Engine Repair*.

## **Section 10—Drive Trains and Axles**

Chapters 53–64 explain the construction, operation, and repair of all types of automotive drive trains. You will learn about front-wheel drive, rear-wheel drive, and all-wheel drive. The material covered in this section will give students the knowledge needed to work on any make or model car, truck, or sport utility vehicle. This section will also help students pass ASE Test A2, *Automatic Transmission/Transaxle*, and Test A3, *Manual Drive Train and Axles*.

## **Section 11—Suspension, Steering, and Brakes**

Chapters 65–74 detail the operation, construction, service, and repair of everything from tires to anti-lock brake systems. They contain information that will help make your students better chassis technicians. This section will help students pass ASE Test A4, *Suspension and Steering*, and Test A5, *Brakes*.

## **Section 12—Heating and Air Conditioning**

Chapters 75 and 76 explain the operation, service, and repair of heating and air conditioning systems. This section details state-of-the-art methods for repairing these systems without damaging our environment. This section will also help students pass ASE Test A7, *Heating and Air Conditioning*.

## **Section 13—Safety, Security, and Navigation Systems**

Chapters 77 and 78 detail the operation and service of various restraint systems, including seat belts and air bags. Chapter 79 covers security and navigation systems, as well as those systems that will be found on vehicles in the not-too-distant future. Chapter 80 describes the factors that can determine your degree of success as an automotive technician.

### **About the course**

Automotive Technology is organized around the eight ASE automobile test areas and is correlated to the NATEF Task List. Terminology used throughout the text reflects the SAE J1930 standard.

The text has many features that ease comprehension, including:

- Various fonts used for emphasis.
- Learning objectives.
- Chapter Summaries.
- Lists of Important Terms.
- Review Questions.
- ASE-Type Questions.
- End-of-chapter Activities.
- Notes, Cautions, Warnings, and procedures.
- Troubleshooting charts.
- An extensive use of color.
- System coverage divided into theory and application chapters.

## **F. REQUIRED COMPETENCIES (PERFORMANCE OBJECTIVES) FOR ARTICULATION**

This course is designed to provide you with the necessary environment and interactions to advance your knowledge and understanding in owning, maintaining, and repairing the automobile.

### **Los Medanos Course-Level Student Learning Outcomes:**

1. Safely perform standard auto shop practices.
2. Properly write out shop work order forms
3. To correctly identify and demonstrate proper use of the hand tools, equipment and fasteners necessary to perform automotive repairs.
4. Perform light service work on multiple automobile systems using proper procedures by the automotive manufactures.

## **G. METHODS FOR END OF COURSE ASSESSMENT:**

Course Evaluation: You will be evaluated on the achievement of the tasks/skills as listed on the competency profile, lab activity participation, homework, essays, and exams.

- Grade Distribution/Weight
- 25% Competency Profile
- 25% Lab Activities
- 25% Homework & Essays
- 25% Exams (Written and Practical)

Grades: Assessments will be recorded on a 4 point scale and averaged together within the main categories (competency profile, lab activities, homework, essays, and exams) to establish a final grade.

4.0 = A	2.7 = B-	1.3 = D+
3.7 = A-	2.3 = C+	1.0 = D
3.3 = B+	2.0 = C	0.7 = D-
3.0 = B	1.7 = C-	0 = F

#### H. PROCEDURES AND/OR CRITERIA FOR COURSE ARTICULATION:

*(all of the following must be met)*

1. Students **must apply** to Los Medanos College and register in **CATEMA** in order to receive credit recommendations by their high school teacher.
2. Students **must be recommended** for credit by their high school teacher in **CATEMA**. *Teachers recommend credit at their discretion.*
3. Students **must complete** the **Introduction to Automotive Technology or ROP Automotive Technology class** at **Pittsburg High School** with an overall grade of "B" or better.  
*High school teachers will enter this grade in CATEMA.*
4. Students **must earn** a "B" or better on the agreed upon college/high school final exam procedure.  
*High school/Adult Ed. teachers will enter this exam grade in CATEMA.*
5. Articulated college credit may only be recommended by the high school teacher and received by the student **within the academic year** in which it was earned.
6. Upon completion of the above, the student will receive on his/her LMC and CCCC (California Community College District) transcript the units of credit for LMC's **AUTO-110 "Automotive Essential Car Care"** course.
7. College transcripts will reflect the **FINAL EXAM GRADE** earned and will be notated as \*Credit by Exam.

#### I. TEXTBOOKS OR OTHER SUPPORTING MATERIALS

1. Duffy, James E. (2009). Modern Automotive Technology (7th Edition) Tinley Park, Ill. The Goodheart-Willcox Company ISBN: 978-1-59070-957-3 Available at G-W.com
2. Gray, M.E., & Gray, L.E. (2007). Auto Upkeep: Basic Car Care, Maintenance, and Repair (2nd Edition). New Windsor, MD: Rolling Hills Publishing.  
ISBN: 978-0-9740792-1-9 Available at [www.AutoUpkeep.com](http://www.AutoUpkeep.com).

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### COLLEGE SIGNATURES

Natalie Hannum

Natalie Hannum (Oct 18, 2022 13:02 PDT)

Natalie Hannum  
LMC Vice President of Instruction

Date



Dennis Franco  
LMC Dean of Instruction (Interim), Vocational Technology

Date

Jason Dearman

Jason Dearman (Oct 18, 2022 12:17 PDT)

Jason Dearman  
Automotive Technology Department Chair

Date

### HIGH SCHOOL/ROP/DISTRICT SIGNATURES

Todd Whitmire

Todd Whitmire (Oct 19, 2022 07:53 PDT)

Todd Whitmire  
Principal, Pittsburg High School

Date

Anthony Molina

Anthony Molina (Jan 21, 2023 09:34 PST)

Anthony Molina  
PUSD Executive Director of Educational Services

Date

Dan Hanel

Dan Hanel  
Coordinator, College & Career Readiness

Date

M. Childers

M. Childers (Oct 19, 2022 11:04 PDT)

Mark Childers  
Faculty, Pittsburg High School

Date