



**Palm Springs Unified School District
Secondary Course Description**

District Office Use Only

Cabinet/BOE Approval Date: January 24, 2017
 Transcript Title(s)/Abbreviation: Automotive Technology II Course Code(s)/Number(s): 5242

Section 1: Course Content

1. Course Title: **Automotive Technology II**
 2. CALPADS Code: 5669 Date submitted to Curriculum Advisory: 11/16/2016
 3. Re-write? No Yes (If "Yes," what is the District Course Code)
 4. Is this a dual Enrollment course? No Yes (If so content cannot be changed)
 5. Subject area: Career Technical Education (CTE) 12. Career Pathway Relationship
 6. PSUSD Department: Vocational Is this course an Industry and Career Pathway-related course?
 7. Grade: 12 No Yes
 8. Unit Value: 10 PSUSD credits (one year/two semesters) If "Yes," which Industry? Transportation
 9. PSUSD weighted GPA? No Yes Which Pathway? System Diagnosis and Repair
 10. Is this an "online" learning course? No Yes What sequence level? 19-Advanced
 If "Yes," list the online provider: 13. Is this course an Academy-related Course?
 11. Alternative Education Program course? No Yes No Yes
 If "Yes," which Academy? RACE academy

School and District Information

School Information

14. School Name: Rancho Mirage High School School District: Palm Springs Unified School District
 City and State: Palm Springs, California District Web Site: http://www.psusd.us

School Course List Contact Information (Name of AP of Curriculum or Principal)

15. Name: Teresa Haga Position/Title: Assistant Principal
 Email: thaga@psusd.us Phone #: 760-202-6455 Ext: _____

Teacher Contact Information (Name of teacher/administrator who authored this course)

16. Name: David Holland Position/Title: Teacher
 Email: dholland@psusd.us Phone #: 760-202-6455 Ext: _____

17. Course Overview [Provide a brief summary/snapshot (3-5 sentences) of the course's content]:

This is the capstone course in a 3 year sequence. Diagnostic procedures and methodical application of engine troubleshooting and performance and engine service and repair procedures and methods are emphasized in real-world scenarios. Designed to expose the students to real world diagnostic procedure, automotive malfunctions and real world application of structured repair tracts.
 The course immerses the student in an environment which most accurately reflects every aspect of the industry, from the duties of the technician, the service writer, human resources dept., parts dept. and upper management positions.

18. Texts and Supplemental Instructional Materials

Texts: Electronic ver. Modern Automotive Technology Premium 8th edition Edition/Year: 2014
 Author: James E. Duffy Primary Textbook: No Yes
 Publisher: The Goodheart-Wilcox Company, Inc. Website/url : www.g-wonlinetextbooks.com
 Supplemental Materials:



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- Electronic ver. Modern Automotive Technology 8th edition Workbook
- Electronic ver. Modern Automotive Technology 8th edition NATEF standards worksheets
- Online DVOM (Digital Ohm Volt Meter) simulations

19. COURSE CONTENT:

For each unit of the course, provide:

1. A brief description (5-10 sentences) of topics to be addressed that demonstrates the critical thinking, depth and progression of content covered.
 2. A brief summary (2-4 sentences) of at least one assignment that explains what a student produces, how the student completes the assignment and what the student learns.
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Unit 1. Engine troubleshooting and performance

Students will gain insight into the most common engine performance problems, identify the symptoms for them and explain typical causes. They will be able to use a systematic approach when diagnosing these problems and use OBD scan tool technology to find mechanical and electrical problems that adversely affect gasoline engine smoothness, efficiency, power and emissions.

Key assignment: Students will be able to correctly answer ASE questions relating to problems affecting engine performance.

Unit 2. Advanced Diagnostics

Students will use advanced diagnostic techniques such as snapshot and data stream values to find problems not tripping trouble codes to troubleshoot difficult problems. They will use breakout box to measure circuit values and identify electromagnetic interference (EMI) They will use an oscilloscope on any type of analog or digital sensor.

Key assignment: Students will be able to summarize how to use an engine analyzer to find problems caused by part or component failures. They will evaluate waveforms from scope test patterns to analyze the operation of sensors, actuators, and other electrical-electronic devices.

Unit 3. Engine Tune Up

Student will understand the typical difference between a minor and a major tune up. They will list apply the basic steps to perform each tune up and the safety measures and precautions needed during this process. They will be able to name and replace the parts needed during the tune up. Students will also explore the difference in how diesel engines vary from gasoline engines.

Key assignment: Students will be able to correctly answer ASE certification questions on engine tune-up and engine problem diagnosis.

Unit 4. Engine Mechanical Problems

Students will explore why proper diagnostic methods are important to engine repair and identify common symptoms of engine mechanical problems. They will be able to explain and find abnormal engine noises, perform compression tests on various engines and explain the results. They will also perform cylinder leak down tests and analyze the results.

Key assignment: Students will be able to summarize causes and corrections of engine mechanical problems and perform initial inspections such as pressure tests and electrical tests to determine the mechanical condition of major internal engine parts.

Unit 5. Engine removal, disassembly and cleaning

Students will identify and explain the information contained in a vehicle identification number (VIN). They will determine if the engine needs to be removed to make specific repairs, summarize and execute the steps in preparing the engine for removal. Focus is placed on how to keep wires, lines, and parts organized during engine removal and teardown.

Key assignment: Students will summarize and execute attaching a lift to the engine for removal. Once removed they will explain and execute the major steps in disassembling the engine, and explain and use different methods for cleaning the engine parts.

Unit 6. Short block rebuilding and machining

Students will be able to locate cracks in cylinder blocks, check for main bearing wear and measure deck warpage. They will check for cylinder taper and out-of-round conditions and determine piston to cylinder clearance. They will be able to describe the steps in boring a cylinder oversize and summarize camshaft bearing installing and execute the procedure properly. Crankshaft turning, undersize bearing identification and bearing clearance measurement are also covered.

Key assignment: Students will assemble a short block, describe and apply the steps in balancing the engine.

Unit 7. Engine Top End Rebuilding

Students will check cylinder heads for cracks, warpage and other problems. They will measure valve guide wear, valve stem wear, knurl, ream and replace valve guides. They will recondition valve seats or replace as needed and reassemble the cylinder head.

Key assignment: Students will measure camshaft lobe journal wear, camshaft end play, bearing clearance, service rocker arms and shafts, push rods and lifters.

Unit 8. Engine Front End Service

In this unit students will check timing chain wear, install a timing chain assembly, service the timing chain tensioner, replace a front cover seal and install the engine front cover.



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Key assignment: Students will then install a vibration damper, timing gears and check timing gear runout and backlash. They will then properly torque timing the gear sprockets fasteners, install a timing sprocket or belt, adjust belt tension and finally install a timing belt cover.

Unit 9. Engine Reassembly, Installation and Break-In

In this unit students will be required to recall general engine reassembly rules and properly apply them. In the correct order, they will install an oil pump and pan, install a cylinder head assembly, lifters, exhaust and intake manifold, camshaft housing cover, install and overhead cam if applicable, adjust the valve train clearance, and finally apply protective paint to the assembled engine.

Key assignment: Students will complete the final assembly steps and install the engine into the vehicle. A proper startup will be conducted and students will explain and demonstrate proper engine break-in procedure.

All the above units culminate in one assignment in which the students are required to apply fundamentals, theory and proper sequential steps and procedures learned in each unit. The project consists of rebuilding a malfunctioning engine in an actual vehicle. Students will learn through hands-on application of the fundamentals studied in each unit and to properly apply industry standard techniques and methods, operate in a safe manner always, analyze components and apply corrective measures, and to operate within prescribed guidelines in an organized and sequential manner.

Section 2: Course Information

1. Was this course "Previously Approved" by UC? No Yes

If "No," proceed to the Course Description Section (Section 4).

If "Yes," indicate which category applies:

2. Is this course modeled after an UC-approved course from another high school outside of our district? No Yes

If "Yes," list which school and the school's ATP code:

Exact Course Title:

3. Is this course modeled after an identical course approved by UC for the current year at another high school in PSUSD:

No Yes (If "Yes," what school?)

Exact Course Title:

4. Is this course being reinstated after removal within 3 years: No Yes

If "Yes," what year was the course removed from the list?

Exact Course Title:

5. Has this course been provided program status, is not an online course, and is it listed below? No Yes

If "Yes," Program Status:

6. If "Advanced Placement," has it been authorized by the College Board through the AP audit process?

No Yes In Progress If "In Progress," date submitted to AP:

Exact Program Course Title:

7(a). Is this course provided by one of the UC-approved online curriculum providers listed in #8?

No Yes

7(b). Have you signed the appropriate partnership agreement with the provider regarding methods of delivery and instruction?

No Yes

8. If the answer to either 7(a) or (b) is "No," UC will not approve this course. If "Yes" to both 7(a) and (b), then select the appropriate option from the Online Provider List below:

Section 3: Course Description

1. Seeking "Honors" Distinction: No

2. Subject Area: _____ Category: _____

Section 4: Course Attributes

1. Is this course classified as a Career Technical Education Course?

No Yes

2. Is this course classified as a Career Technical Education Course?

Industry: Transportation Career Pathway: Systems Diagnostics and Repair