Palm Springs Unified School District
Secondary Course Description

Please read: ***Sections 1 and 2 must be completed and submitted to the Director of Secondary Curriculum and Instruction for all courses seeking PSUSD Cabinet and Board approval. Sections 3 and/or 5 must be completed if the course will be submitted to the University of California (UC) for placement on your school's a-g list and/or Career and technical educational (CTE).***

****NOTE: If this is a COD "Dual Enrollment "course then the course cannot be changed.***

District Office Use Only

Transcript Title(s)/Abbreviation: Auto 013A Automotive Braking Systems

Transcript Course Code(s)/Number(s): 5247 Cabinet/ BOE Approval Date: November 13, 2018

Section 1: Course Content

1. Course Title: Auto-013A Automotive Braking Systems

Date this course was first submitted to the Curriculum Advisory**:** October 18, 2018

2. Is this a re-write of an existing course? No If "Yes," what is the District Course Code:

3. CALPADS Code : 8532

4. PSUSD graduation requirement subject area: CTE

5. Unit Value for complete course: 10 PSUSD credits (one year/two semesters)

6. Grade Level: -- -- -- 12

Course can be repeated for Credit? ☐

Note: Grade level pertains to which grades the course has been designed.

7. PSUSD Department: Vocational

8. PSUSD weighted GPA? No 9. Is this an "online" learning course? No

Dual Enrollment? ☑ If "Yes," list the online provider:

Note: If "Yes," an additional course code will be created by ETIS with a virtual designation.

10. Will this course be offered only through the Alternative Education Program? No

11. Career Pathway Relationship

Note: Refer to the list of Industries and their associated Pathways in Section 5, Item #38

Is this course an Industry and Career Pathway-related Course? Yes

If "Yes," which Industry? Transportation

Which Pathway? Systems Diagnostics, Service and Repair

What sequence level? 19-Advanced (Capstone)

12. Is this course an Academy-related Course? Yes If "Yes," which Academy? RACE Academy

13. 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.

Course Content & Scope

Lecture:

1. Orientation, safety & environmental concerns
2. Auto repair industry terms ans conventions
3. Hand tools, special service tools and shop equipment
4. Hydraulic theory and systems
5. Braking system overview
6. Principles of braking
7. Disc and drum brake theory, including power assist: diagnosis, service and repair
8. Antilock brake system theory
9. Brake system service
10. Brake system diagnosis, troubleshooting and repair
11. Antilock brake system diagnosis, troubleshooting and repair
12. Electrical/electronic brake systems
13. Chrysler web-based training modules

Lab:

1. Demonstrate proper shop safety and environmental practices
2. Tool and equipment useage
3. Preventative maintenance
4. Proper procedures related to electrical/electronic brake systems
5. Diagnose and repair disc and drum brake system concerns
6. Diagnose and repair antilock brake system concerns
7. Diagnosis and repair of power assist systems
8. Perform brake system service
9. Properly document repair orders
10. Proficiency at researching service information
11. Required tasks to meet NATEF 2017 MAST standards

Course Student Learning Outcomes:

1. Demonstrate shop safety practices.
2. Diagnose and repair intermediate to advanced level base brake system malfunctions.
3. Diagnose and repair intermediate to advanced level antilock brake system (ABS) concerns.
4. Display teamwork.
5. Demonstrate proficiency in referencing service information and documenting repairs.
6. Demonstrate ability to inspect and perform maintenance on base brake systems.

Course Objectives: *Upon completion of this course, students will be able to:*

Upon satisfactory completion of the course, in a timely manner to industry standards, students will be able to:

b. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

c. Identify and interpret brake system concern; determine necessary action.

d. Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins.

e. Locate and interpret vehicle and major component identification numbers, Vehicle Information Number (VIN), vehicle certification labels, calibration decals.

f. Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law).

g. Measure brake pedal height; determine necessary action.

h. Check master cylinder for internal and external leaks and proper operation; determine necessary action.

i. Remove, bench bleed, and reinstall master cylinder.

j. Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine necessary

action.
k. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; determine necessary action.
l. Fabricate and/or install brake lines (double flare and International Standards Organization {ISO} types); replace hoses, fittings, and supports as needed.
m. Select, handle, store, and fill brake fluids to proper level.
n. Inspect, test, and/or replace metering (hold-off), proportioning (balance), pressure differential, and combination valves.
o. Inspect, test, and adjust height (load) sensing proportioning valve.
p. Inspect, test, and/or replace components of brake warning light system.
q. Bleed (manual, pressure, vacuum or surge) brake system.
r. Flush hydraulic system.
s. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.
t. Remove, clean (using proper safety procedures), inspect, and measure brake drums; determine necessary action.
u. Refinish brake drum.
v. Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.
w. Remove, inspect, and install wheel cylinders.
x. Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings.
y. Install wheel, torque lug nuts, and make final checks and adjustments.
z. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.
aa. Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing; determine necessary action.
ab. Remove, clean, and inspect pads and retaining hardware; determine necessary action.
ac. Clean and inspect caliper mounting and slides for wear and damage; determine necessary action.
ad. Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged
or worn parts.
ae. Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks.
af. Remove and reinstall rotor.
ag. Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determining need to machine or replace.
ah. Refinish rotor on vehicle.
ah. Refinish rotor on vehicle.
ai. Refinish rotor off vehicle.
aj. Adjust calipers equipped with an integrated parking brake system.
ak. Install wheel, torque lug nuts, and make final checks and adjustments.
al. Test pedal free travel with and without engine running; check power assist operation.
am. Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.
an. Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; determine necessary action.
ao. Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action.
ap. Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust wheel bearings.
aq. Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, or replace as needed.
ar. Check parking brake operation; determine necessary action.
as. Check operation of parking brake indicator light system.
at. Check operation of brake stop light system; determine necessary action.
au. Replace wheel bearing and race.
av. Inspect and replace wheel studs.
aw. Remove and reinstall sealed wheel bearing assembly.
ax. Identify and inspect antilock brake system (ABS) components; determine necessary action.
ay. Diagnose antilock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine necessary action.
az. Bleed the antilock brake system's (ABS) front and rear hydraulic circuits.
ba. Remove and install antilock brake system (ABS) electrical/electronic and hydraulic components.
bb. Test, diagnose and service ABS speed sensors, toothed ring (tone wheel), and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO) (includes output signal, resistance, shorts to voltage/ground, and frequency data).

bc. Diagnose antilock brake system (ABS) braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).
bd. Identify traction control/vehicle stability control system components.
be. Demonstrate proper shop safety and environmental protection practices.

Methods of Instruction:
a. Demonstration, Repetition/Practice
b. Discussion
c. Laboratory
d. Lecture
e. Observation
f. Participation
g. Technology-based instruction

Example Assignments

In-class Assignments
Review homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week.
1.Begin 3 SP2 safety tests.
3. Notes on lecture.
4. Participation in discussion related to topic of lecture.
5. Students must keep a notebook of all course materials including homework, class notes, handouts, class project and team activities. The notebook must be organized by chapter, in-class notes, handouts and extra-credit assignments. The notebook will be evaluated after the half-way point and graded at the end of the course.
Review and discuss vehicle diagnosis, troubleshooting and repair of personal, shop and other vehicles to be evaluated by the instructor during lab time.
6.Must develop teamwork skills through classroom interaction and discussion.

Out-of-class Assignments
1. Readings from required text: 1-3 chapters per week from both classroom and shop manuals.
2. Homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week.
3. Completion of 3 SP2 safety tests.
4. Assigned readings and written summaries from selected instructor handouts.
5. Written summaries and analysis of assigned websites.
Must complete a course project consisting an essay describing, analyzing and summarizing a selected topic, including out of class research and fieldwork.
6.Students must keep a notebook of all course materials including homework, class notes, handouts, class project and team activities. The notebook must be organized by chapter, in-class notes, handouts and extra-credit assignments. The notebook will be evaluated after the half-way point and graded at the end of the course.
7.Vehicle diagnosis, troubleshooting and repair of personal, shop and other vehicles to be evaluated by the instructor during lab time.
8.Hands-on lab worksheets matching each course objective. These will be graded by the instructor throughout the semester during lab time.
9. Must develop teamwork skills through lab activities and assigned special projects.
10. Chrysler web-based training modules.

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

This course provides theory and hands-on experience in automotive braking systems including: theory of operation, service, diagnosis and repair including both base braking and anti-lock braking systems and components. This class provides lecture/discussion and hands-on experience understanding, servicing, troubleshooting, diagnosing and repairing automotive braking. A test fee for the appropriate Automotive Service Excellent (ASE) Student Exam is required.

15. Texts and Supplemental Instructional Materials *(all non-core instructional materials are the responsibility of individual schools to purchase.)*

Texts: Halderman, James (2015). NATEF Correlated Task Sheets for Automotive Technology (5th/e). Pearson.

Supplemental Materials: Johanson (2013). Auto Brakes (4th/e) & Workbook. Goodheart-Willcox. ISBN: 9781619607316

16. Will this course be submitted for approval by UC? No

Section 2: School and District Information

School Information

1. 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)

2. Name: Kim Ballard

Position/Title: Assistant Principal Email: kballard1@psusd.us

Phone #: 760-202-6455 Ext: 1406

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

3. Name: William Bodnar

Position/Title: Teacher Email: wbodnar@psusd.us

Phone #: 760-202-6455 Ext. 2611

Palm Springs Unified School District
Secondary Course Description

Section 3: Course Information

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

Note: if this course is to be submitted to UC and it was "Previously Approved," the exact same course title as the previously approved course must be used. Compete outlines are not needed for courses previously approved by UC. Courses that are defined as "previously approved" are courses from the following programs (Advanced Placement, International Baccalaureate, ROP courses, etc.), or courses from within the same district, or courses that have been removed within a three-year window are being reinstated, and/or courses from UC-approved online providers. Courses modeled after courses from outside the school district are also defined as "previously approved" but a complete course description will be required for submission to UC. Each section below represents an individual page on the UC electronic submission site.

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

If "Yes," indicate which category applies:

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

Note: If "Yes," you will be required to submit a complete course description. UC will review the previous submission, if it is available, to assist them in their review process.

If "Yes," list which school: _____

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

If "Yes," what school? _____

Exact Course Title: _____

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

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

If "Yes," select an option from the Program Status list: -- _____

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

Note: UC will only allow Advanced Placement courses that have passed or are in the AP audit process. UC requires all AP courses on your list, including those approved in prior years, to be verified via the College Board AP audit process. UC will run quarterly reports based on AP Audit data. AP courses not listed on the AP audit list will be removed.

If "In Progress," date submitted to AP: _____

MM/DD/YYYY

Exact Program Course Title: -- _____

7(a). Is this course provided by one of the UC-approved online curriculum providers listed in #8? No

7(b). Have you signed the appropriate partnership agreement with the provider regarding methods of delivery and instruction? No

Note: You must have signed an agreement with the appropriate provider and filed with UC in order to use their courses.

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:

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9. Seeking "Honors" Distinction

Note: To receive "Honors" distinction for both UC and PSUSD, the course content must satisfy certain requirements. For information about these requirements, refer to the a-g Guide: http://www.ucop.edu/a-gGuide/ag/a-g/honors.html. For "Previously Approved" courses (including AP and IB), the honors information will be pre-populated as applicable on your UC submission template.

No

Note: "Other Honors" is defined by UC as a course specifically designed with distinctive features which set it apart from regular high school courses in the same discipline areas. The course should be seen as comparable in terms of workload and emphasis to AP, IB or introductory college courses in the subject. Honors courses must be designed for the 11th and 12th grade level to be UC approved and require a comprehensive, year-long written final exam. In addition to AP and IB higher level courses, ***high schools may certify not more than one honors level course per grade level in each of the following subject areas only: history, English, advanced mathematics, each laboratory science course, each language other than English, and each of the four VPA disciplines.*** *If there are no AP or IB or higher level courses in a given subject area, the high school may certify up to, but not more than two honors level courses in that area.*

10. Subject Area and Category

"a"- History/Social Science

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"b"- English

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"c"- Mathematics

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"d"- Laboratory Science

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Note: Students electing to enroll in an integrated-science program (ISP) are strongly advised by UC to complete the entire three-year sequence. In most cases, the first year of an integrated science sequence fulfills only the "g" elective requirement: the second and third years of the sequence then fulfill the two-year "d" laboratory science requirement. Accordingly, if only ISP 1 and only one of ISP 2 or ISP 3 are completed, then one additional course from the categories of Biology, Chemistry, or Physics from the "d" subject area must be taken to fulfill the "d" requirement.

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Note: This category demonstrates that the course is cross-disciplinary and is often used for advanced science courses such as AP Environmental Science or Biochemistry

"e"- Language Other than English

-- Language --

"f"- Visual and Performing Arts

--

"g"- Elective

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Palm Springs Unified School District
High School Course Description

Section 4: Course Attributes

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

Yes

If no, skip item #2

2. If "Yes," select the name of the industry **and** Career Pathway:

____	Agriculture and Natural Resources	--
____	Arts, Media, and Entertainment	--
____	Building and Construction Trades	--
____	Business and Finance	--
____	Education, Child Development and Family Services	--
____	Energy, Environment, and Utilities	--
____	Engineering and Architecture	--
____	Fashion and Interior Design	--
____	Finance and Business	--
____	Health Science and Medical Technology	--
____	Hospitality, Tourism, and Recreation	--
____	Information and Communication Technologies	--
____	Manufacturing and Product Development	--
____	Marketing, Sales, and Service	--
____	Public Services	--
✓	Transportation	Systems Diagnostics and Service