

Course Outline of Record

1. Course Code: AUTO-021A
2.
  - a. Long Course Title: Automotive Diagnosis and Troubleshooting
  - b. Short Course Title: AUTO DIAG & TROUBLE
3.
  - a. Catalog Course Description:  
 This course provides an overview of Root Cause Analysis and its application as relevant to automotive diagnosis and troubleshooting. The focus is on electrical and drivability diagnosis, but includes guidelines for any vehicle system diagnosis and troubleshooting. The coursework will include scenario based diagnosis and cold circuit analysis. This course will help anyone interested in developing an effective, logical approach to automotive diagnosis and troubleshooting.
  - b. Class Schedule Course Description:  
 This course provides an overview of Root Cause Analysis and its application as relevant to automotive diagnosis and troubleshooting.
  - c. Semester Cycle (if applicable): Spring
  - d. Name of Approved Program(s):
    - AUTOMOTIVE ELECTRICAL Certificate of Achievement
4. Total Units: 2.00      Total Semester Hrs: 36.00  
 Lecture Units: 2      Semester Lecture Hrs: 36.00  
 Lab Units: 0      Semester Lab Hrs: 0  
 Class Size Maximum: 30      Allow Audit: No  
 Repeatability No Repeats Allowed  
 Justification 0
5. Prerequisite or Corequisite Courses or Advisories:  
*Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm I-A)*  
 Prerequisite: AUTO 011B
6. Textbooks, Required Reading or Software: (List in APA or MLA format.)
  - a. Anderson, Bjorn (2006). Root Cause Analysis (2nd/e). ASQ. ISBN: 9780873896924  
 College Level: Yes  
 Flesch-Kincaid reading level: 13
7. Entrance Skills: *Before entering the course students must be able:*
  - a. Basic electrical theory.
    - AUTO 011B - Identify and interpret electrical/electronic system concern; determine necessary action.
    - AUTO 011B - Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems.
    - AUTO 011B - Check electrical circuits with a test light; determine necessary action.
  - b. Wiring and circuit diagrams.
    - AUTO 011B - Use wiring diagrams during diagnosis of electrical circuit problems.
  - c. Understanding of automotive electrical accessories.
    - AUTO 011B - Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action.
    - AUTO 011B - Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.
    - AUTO 011B - Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; perform necessary action.
8. Course Content and Scope:

# AUTO 021A-Automotive Diagnosis and Troubleshooting

## Lecture:

1. Why study diagnosis & troubleshooting
2. Why Root Cause Analysis
3. Problem solving tools
4. Importance of subject knowledge
5. 5-Step troubleshooting process
6. Physical inspection
7. Fuses, batteries and TSBs
8. Electrical troubleshooting scenarios
9. Drivability troubleshooting scenarios
10. General vehicle system diagnosis & troubleshooting
11. Troubleshooting helps

Lab: (if the "Lab Hours" is greater than zero this is required)

## 9. Course Student Learning Outcomes:

1.

Describe the system operation and component function of 3 major automotive systems.

2.

Given a real-life advanced level diagnostic scenario, list possible causes for failure.

3.

Given a real-life advanced level diagnostic scenario, list the tests to run and actions to take based on test results.

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

- a. Explain each key step of "Root Cause Analysis".
- b. Describe common mistakes techs make with each step of the 5-Step Troubleshooting Process.
- c. Summarize interviews, related to diagnosis & troubleshooting, of 3 top technicians.

## 11. Methods of Instruction: *(Integration: Elements should validate parallel course outline elements)*

- a. Discussion
- b. Distance Education
- c. Lecture
- d. Participation
- e. Role Playing
- f. Supplemental/External Activity

## 12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*

In Class Hours: 36.00

Outside Class Hours: 72.00

### a. In-class Assignments

1. Lecture
2. Discussion participation
3. Scenario based diagnosis (instructor led)
4. Service information reference activities.

### b. Out-of-class Assignments

- a. Selected chapter in the required text
  - b. Homework from required text
  - c. Scenario based diagnostic assignments
  - d. Selected Internet readings
  - e. Postings on discussion board

f. Internet research

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*

- Written homework
- Reading reports
- Computational/problem solving evaluations
- True/false/multiple choice examinations
- Mid-term and final evaluations
- Student participation/contribution

14. Methods of Evaluating: Additional Assessment Information:

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*

CSU/UC Transfer Course

B. Transfers to CSU

PO - Career and Technical Education

Apply critical thinking skills to execute daily duties in their area of employment.

Apply critical thinking skills to research, evaluate, analyze, and synthesize information.

IO - Scientific Inquiry

Collect and analyze data. Skills of data collection include an understanding of the notion of hypothesis testing and specific methods of inquiry such as experimentation and systematic observation.

Analyze quantitative and qualitative information to make decisions, judgments, and pose questions.

16. Comparable Transfer Course

University System	Campus	Course Number	Course Title	Catalog Year
UC	UC Riverside			

17. Special Materials and/or Equipment Required of Students:

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18. Materials Fees:  Required Material?

Material or Item	Cost Per Unit	Total Cost
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19. Provide Reasons for the Substantial Modifications or New Course:

2 year periodic review.

20. a. Cross-Listed Course (*Enter Course Code*): *N/A*  
 b. Replacement Course (*Enter original Course Code*): *N/A*

21. Grading Method (*choose one*): Letter Grade Only

22. MIS Course Data Elements

- a. Course Control Number [CB00]: CCC000582265
- b. T.O.P. Code [CB03]: 94800.00 - Automotive Technology
- c. Credit Status [CB04]: D - Credit - Degree Applicable
- d. Course Transfer Status [CB05]: B = Transfer CSU
- e. Basic Skills Status [CB08]: 2N = Not basic skills course
- f. Vocational Status [CB09]: Advanced Occupational
- g. Course Classification [CB11]: Y - Credit Course
- h. Special Class Status [CB13]: N - Not Special
- i. Course CAN Code [CB14]: *N/A*

# AUTO 021A-Automotive Diagnosis and Troubleshooting

j. Course Prior to College Level [CB21]: Y = Not Applicable

k. Course Noncredit Category [CB22]: Y - Not Applicable

l. Funding Agency Category [CB23]: Y = Not Applicable

m. Program Status [CB24]: 1 = Program Applicable

Name of Approved Program (if program-applicable): AUTOMOTIVE ELECTRICAL

*Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)*

## 23. Enrollment - Estimate Enrollment

First Year: 30

Third Year: 30

## 24. Resources - Faculty - Discipline and Other Qualifications:

a. Sufficient Faculty Resources: Yes

b. If No, list number of FTE needed to offer this course: *N/A*

## 25. Additional Equipment and/or Supplies Needed and Source of Funding.

N/A

## 26. Additional Construction or Modification of Existing Classroom Space Needed. (Explain:)

N/A

## 27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES

Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the Course: Yes

28. Originator Douglas Hugh Redman Origination Date 01/06/17