AUTO 340C: CNG DIAGNOSIS & TROUBLESHOOT

Originator
Douglas Redman

Co-Contributor(s)

Name(s)
Anderson, Dorothy

Justification / Rationale
Add online modalities. We have had requests from Clean Cities Coalition and local industry partners to conduct online training.

Effective Term
Fall 2023

Credit Status
Noncredit

Subject
AUTO - Automotive Technology

Course Number
340C

Full Course Title
CNG Diagnosis & Troubleshoot

Short Title
CNG DIAG & TROUBLESHOOT

Discipline

Disciplines List
Automotive Technology

Modality
Face-to-Face
100% Online
Hybrid

Catalog Description
This course provides classroom lecture/discussion and interactive training on CNG vehicle diagnosis and repair. The course is designed to introduce the service technician to safety, diagnostic and troubleshooting practices and procedures unique to gaseous fuel vehicles including: ignition, fuel delivery and emissions systems design, operation, diagnosis and service.

Schedule Description
This course provides classroom lecture/discussion and interactive training on CNG vehicle diagnosis and troubleshooting.
Prerequisite: AUTO 340

Total Non-Credit Contact Hours
36

Lecture Units
0

Lab Units
0

In-class Hours
18

Out-of-class Hours
18

Total Course Units
0

Total Semester Hours
36

Override Description
Noncredit courses do not have lecture and lab. The out of class hours were adjusted to provide the same total as the equivalent credit course.

Prerequisite Course(s)
AUTO 340

Required Text and Other Instructional Materials

Resource Type
Web/Other

Description
Handouts provided by the instructor

Resource Type
Web/Other

Description
NFPA 52 Vehicular Fuel Systems Code, 2015 Edition

Class Size Maximum
21

Entrance Skills
Describe component overview and operation.

Requisite Course Objectives
AUTO 340-Upon successful completion of this course, students will be able to: describe CNG components and describe their operation.

Entrance Skills
List shop and vehicle safety practices relevant to compressed natural gas (CNG) vehicles.

Requisite Course Objectives
AUTO 340-Upon successful completion of this course, students will be able to: List shop and vehicle safety practices relevant to compressed natural gas (CNG) vehicles.

Entrance Skills
Comply with shop and vehicle safety practices relevant to compressed natural gas (CNG) vehicles.

Requisite Course Objectives
AUTO 340-Comply with shop and vehicle safety practices relevant to compressed natural gas (CNG) vehicles.

Entrance Skills
Describe CNG components and describe their operation.

Requisite Course Objectives
AUTO 340-Basic CNG component overview and operation.

Course Content

1. Diagnose, troubleshoot and repair CNG ignition system malfunctions.
2. Diagnose, troubleshoot and repair CNG fuel system malfunctions.
3. Diagnose, troubleshoot and repair CNG emissions system malfunctions.

Course Objectives

	Objectives
Objective 1	Interpret and follow applicable diagnosis and wiring diagrams from CNG vehicle service information.
Objective 2	Diagnose, troubleshoot and repair intermittent or complete failure of electric, electronic or mechanical devices in a CNG vehicle fuel system.
Objective 3	Diagnose, troubleshoot and repair intermittent or complete failure of electric, electronic or mechanical devices in a CNG vehicle fuel system.
Objective 4	Diagnose, troubleshoot and repair intermittent or complete failure of electric, electronic or mechanical devices in a CNG vehicle emission system.
Objective 5	Diagnose, troubleshoot a hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, and lean or rich mixture problems on a CNG vehicle; determine needed repairs.
Objective 6	Comply with shop and vehicle safety practices relevant to CNG vehicles.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Demonstrate proficiency in referencing service information and documenting repairs, while practicing shop safety and teamwork when servicing and repairing CNG concerns.
Outcome 2	Discover the root cause of intermediate to advanced level CNG system malfunction given the diagnostic procedures.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Collaborative/Team	Work in a team setting while performing NATEF tasks, researching information and group-based activities.
Technology-based instruction	Diagnostic equipment-based activities.
Lecture	Each class is half lecture covering multiple aspects of course content.
Discussion	Participate in classroom discussions.
Demonstration, Repetition/Practice	Demonstrate their ability to correctly perform a given task not limited to laboratory assignments, research projects, interactive role-play and group activities.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Self-paced testing	Participate in diagnostic scenarios and be required to do a visual presentation.	Out of Class Only
Student participation/contribution	Lab activities and student may participate in diagnostic scenarios.	In and Out of Class
Laboratory projects	Participate in lab-based activities to complete their NATEF standards job sheets.	In Class Only
Reading reports	Understand and follow diagnostic procedures and wiring diagrams.	Out of Class Only
Tests/Quizzes/Examinations	Quizzes and tests based on CNG vehicle scenarios.	In and Out of Class

Other	Out-of-class hours will be accounted for electronically through the learning management system.	Out of Class Only

Assignments

Other In-class Assignments

1. Lecture notes.
2. Diagnosis and troubleshooting CNG vehicle scenarios; participation and discussion.
3. Interactive activities.

Other Out-of-class Assignments

1. Readings from required text: 1-3 chapters per week from both classroom and shop manuals.
2. Completion of two SP2 safety tests.
3. Assigned readings and written summaries from selected instructor handouts.
4. Written summaries and analysis of assigned websites.
5. Vehicle diagnosis, troubleshooting and repair of CNG vehicles to be evaluated by the instructor during lab time.
6. Interactive lab worksheets matching each course objective.
7. Must develop teamwork skills through lab activities and assigned special projects.

Grade Methods

Pass/No Pass Only

Distance Education Checklist

Include the percentage of online and on-campus instruction you anticipate.

Online %

100

What will you be doing in the face-to-face sections of your course that necessitates a hybrid delivery vs a fully online delivery?

This course can be taught in any of the aforementioned modalities. Some industry partners have requested online delivery while others have requested face-to-face. This will allow both needs to be met.

Instructional Materials and Resources

If you use any other technologies in addition to the college LMS, what other technologies will you use and how are you ensuring student data security?

None will be used.

Effective Student/Faculty Contact

Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?

Within Course Management System:

Discussion forums with substantive instructor participation
Online quizzes and examinations
Regular virtual office hours
Timely feedback and return of student work as specified in the syllabus
Weekly announcements

External to Course Management System:

Synchronous audio/video

Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.

Regular effective contact will be practiced through online lecture, discussion board postings, email communications, regular announcements, prompt grading and feedback of assignments, and virtual office hours. This contact between the facilitator and learner on a regular basis will enhance learner confidence and understanding and promote critical thinking and analyzation of subject matter.

Other Information

Provide any other relevant information that will help the Curriculum Committee assess the viability of offering this course in an online or hybrid modality.

With the uncertainty of the teaching environment, enabling the lecture portion of this course to be delivered in an online setting, while keeping the hands-on portion face-to-face, will ensure learners can access needed training to ensure knowledge and experience is achieved to gain employment in the automotive field.

MIS Course Data

CIP Code

47.0614 - Alternative Fuel Vehicle Technology/Technician.

TOP Code

094840 - Alternative Fuels and Advanced Transportation Technology

SAM Code

C - Clearly Occupational

Basic Skills Status

Not Basic Skills

Prior College Level

Not applicable

Cooperative Work Experience

Not a Coop Course

Course Classification Status

Other Non-credit Enhanced Funding

Approved Special Class

Not special class

Noncredit Category

Short-Term Vocational

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Not transferable

General Education Status

Y = Not applicable

Support Course Status

N = Course is not a support course

Allow Audit

No

Repeatability

Yes

Repeatability Limit

NC

Repeat Type
Noncredit

Justification
Noncredit courses are repeatable until students are comfortable they have achieved the skills and knowledge to meet the outcomes and objectives of the course.

Materials Fee
No

Additional Fees?
No

Approvals

Curriculum Committee Approval Date
10/20/2022

Academic Senate Approval Date
10/27/2022

Board of Trustees Approval Date
12/16/2022

Chancellor's Office Approval Date
01/07/2023

Course Control Number
CCC000635358

Programs referencing this course
Compressed Natural Gas Essentials Certificate of Completion (http://catalog.collegeofthedesert.eduundefined/?key=278)
CNG Essentials Certificate of Completion (http://catalog.collegeofthedesert.eduundefined/?key=361)