

# AUTO 340C: CNG DIAGNOSIS & TROUBLESHOOT

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## New Course Proposal

Date Submitted: Sun, 08 Sep 2019 23:11:01 GMT

### Originator

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### Co-Contributor(s)

#### Name(s)

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### Justification / Rationale

CNG (Compressed Natural Gas) is an advanced topic in Alternate Fuels. Training is aimed at, and appropriate for, auto technicians already working in the field. Many have already completed certificates and degrees. Offering a non-credit option is appropriate for this audience.

### Effective Term

Fall 2020

### 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

### Catalog Description

This course provides classroom lecture/discussion and hands-on 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 hands-on training on CNG vehicle diagnosis and troubleshooting.  
Prerequisite: AUTO 340

### Non-credit Hours

36

### Lecture Units

0

### Lab Units

0

**Lab Semester Hours**

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

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**Resource Type**

Web/Other

**Description**

NFPA 52 Vehicular Fuel Systems Code, 2015 Edition

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**Class Size Maximum**

21

**Entrance Skills**

Students should be able to: Describe component overview and operation. Comply with shop and vehicle safety practices relevant to compressed natural gas (CNG) vehicles. List shop and vehicle safety practices relevant to compressed natural gas (CNG) vehicles. Describe CNG components and describe their operation.

**Requisite Course Objectives**

AUTO 340-Basic CNG component overview and operation.

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

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.

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

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**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	Students should be able to read and follow diagnostic procedures and wiring diagrams to repair a malfunction in a CNG vehicle with a Check Engine light on.
Outcome 2	Students should be able to diagnose and troubleshoot a CNG vehicle with either a fuel system, ignition system or emission system malfunction.

**Methods of Instruction**

Method	Please provide a description or examples of how each instructional method will be used in this course.
Collaborative/Team	Student will work in a team setting while performing NATEF tasks, researching information and group based activities.
Technology-based instruction	Diagnostic equipment based activities.
Observation	Student will be observed activities in lab, group activities, information research, collaborative assignments, and other activities assigned.
Lecture	Each class is half lecture covering multiple aspects of course content.
Discussion	Student will participate in classroom discussions.
Demonstration, Repetition/Practice	Each student will 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, Student preparation	Student may participate in diagnostic scenarios and be required to do a visual presentation.	Out of Class Only
College level or pre-collegiate essays	A research report submitted or completed, not limited to a, written, presentation, however the student is required to research information pertaining to the assignment.	Out of Class Only
Student participation/contribution	Lab activities and student may participate in diagnostic scenarios.	Out of Class Only
Laboratory projects	Student will 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. Hands on 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. Hands-on lab worksheets matching each course objective.
7. Must develop teamwork skills through lab activities and assigned special projects.

**Grade Methods**

Pass/No Pass Only

**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

**Allow Audit**

Yes

**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**

10/17/2019

**Academic Senate Approval Date**

10/24/2019

**Board of Trustees Approval Date**

11/13/2019

**Chancellor's Office Approval Date**

01/10/2020

**Course Control Number**

CCC000611538

**Programs referencing this course**

Compressed Natural Gas Essentials Certificate of Completion (<http://catalog.collegeofthedesert.eduundefined?key=278/>)