AUTO 341B: COMPRESSED NATURAL GAS (CNG) CONVERSION & INSTALLATION B

Originator
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Justification / Rationale
Correcting NC Hours

Effective Term
Fall 2023

Credit Status
Noncredit

Subject
AUTO - Automotive Technology

Course Number
341B

Full Course Title
Compressed Natural Gas (CNG) Conversion & Installation B

Short Title
CNG CONV & INSTALL B

Discipline

Disciplines List
Automotive Technology

Modality
Face-to-Face
100% Online
Hybrid

Catalog Description
This course is designed to introduce learners to compressed natural gas (CNG) conversion/ installation basic service and repair. The following topics are covered in this course: review of gaseous fuel safety, review of CNG conversion/installation and service and repair of CNG conversions/installations.

Schedule Description
This course is designed to introduce learners to repair and service of compressed natural gas (CNG) conversions/installations. Prerequisite: AUTO 340

Total Non-Credit Contact Hours
30

Lecture Units
0

Lab Units
0

In-class Hours
30

Out-of-class Hours
15

Total Course Units
0
Total Semester Hours
45

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, 2019 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
Describe CNG components and describe their operation.

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

Course Content
1. Service and repair of vehicles that have had CNG installations/conversions.
2. Verify proper installation/conversion with special attention to safety and legal regulations.
3. Use of repair and service tools and equipment specific to CNG vehicles.

Course Objectives

	Objectives
Objective 1	Inspect the vehicle for pre-existing conditions that may adversely affect the performance of the vehicle.
Objective 2	Repair and service tubing, piping, hose, and valves using appropriate chafing protection, mounting hardware, and protective shields, according to industry safety standards.
Objective 3	Repair and service fuel injection/carburetion or other fuel control components according to manufacturer's instructions.
Objective 4	Repair and service electrical/electronic components using OEM or manufacturer's wire connections and wiring diagrams, applying all safety precautions.
Objective 5	List National Fire Protection Association (NFPA-52) and manufacturer guidelines for converting a gasoline fuel vehicle to a compressed natural gas vehicle.
Objective 6	Fabricate brackets, shields, and braces according to accepted industry standards.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Fabricate and install compressed natural gas fuel lines from tank to injectors including any required components such as check valve, shut-off valve, regulator, and gauge.
Outcome 2	Demonstrate proficiency in following compressed natural gas conversion kit installation instructions including proper vehicle labeling and repair order documentation.
Outcome 3	Demonstrate the installed compressed natural gas fuel system is free of any leaks and meets the National Fire Protection Association (NFPA-52) requirements.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
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.
Technology-based instruction	Diagnostic equipment-based activities.
Lecture	Each class is half lecture covering multiple aspects of course content.
Discussion	Participate in classroom discussions.
Collaborative/Team	Work in a team setting while performing NATEF tasks, researching information and group-based 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
Written homework	Readings from materials provided. Homework multiple-choice questions, fill in the blank and essay questions to be graded each week.	In and Out of Class
Student participation/contribution	Participate in role play activities.	In and Out of Class
Mid-term and final evaluations	Used to evaluate learner's knowledge and understanding of the information presented. Examples of these are not limited to: quizzes, exams, presentations, research or projects.	In and Out of Class
Laboratory projects	Participate in lab-based activities to complete their NATEF standards job sheets.	In and Out of Class
College level or pre-collegiate essays	A research report submitted or completed, not limited to a written, presentation, however the learner is required to research information pertaining to the assignment.	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 from handouts and NFPA 52 classroom manuals.
2. Worksheets and quizzes.
3. Introduction to SP2 safety tests.
4. Written summaries and analysis of assigned websites.
5. Must complete a course project consisting an essay describing, analyzing and summarizing a selected topic, including out of class research and fieldwork.
6. Diagnostic scenarios discussed and group troubleshooting.
7. Service and repair discussion of vehicles converted to or installed with CNG systems including state and federal regulations and safety.

Other Out-of-class Assignments

1. Research using online service information and OEM information.
2. Homework from provided materials: multiple-choice questions, fill in the blank and essay questions to be graded each week.
3. Completion of two SP2 safety tests.
4. Assigned readings and written summaries from selected instructor handouts.
5. Written summaries and analysis of assigned websites.
6. Must complete a course project consisting an essay describing, analyzing and summarizing a selected topic, including out of class research and fieldwork.
7. Vehicle diagnosis, troubleshooting and repair of personal, shop and other vehicles to be evaluated by the instructor during lab time.
8. Interactive lab worksheets matching each course objective.
9. 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.

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:

Direct e-mail
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.

If interacting with students outside the LMS, explain how additional interactions with students outside the LMS will enhance student learning.

Interaction between instructor and learner will help to enhance learning and understanding of subject material.

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
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 required to meet the objectives and outcomes 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
CCC000635360

Programs referencing this course
Compressed Natural Gas Installation Essentials Certificate of Completion (http://catalog.collegeofthedesert.eduundefined/?key=303)
CNG Installation Essentials Certificate of Completion (http://catalog.collegeofthedesert.eduundefined/?key=363)