AUTO 341A: CNG CONVERSION & INSTALLATION A

New Course Proposal

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Originator

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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

341A

Full Course Title

CNG Conversion & Installation A

Short Title

CNG CONV & INSTALL A

Discipline

Disciplines List
Automotive Technology

Modality

Face-to-Face

Catalog Description

This course will introduce students to basic compressed natural gas (CNG) conversion and installation. Focusing on applicable legislation, regulations and procedures for conversion of vehicle from gasoline to CNG. Topics include: review of gaseous fuel safety, CNG conversion/installation and advantages and disadvantages.

Schedule Description

This course is designed to introduce students to compressed natural gas (CNG) conversion and installation. Prerequisite: AUTO 340

Non-credit Hours

81

Lecture Units

0

Lab Units

0

Lab Semester Hours

0

In-class Hours
45

Out-of-class Hours
36

Total Course Units
0

Total Semester Hours
81

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

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-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.

Course Content

1. Advantages and disadvantages of a CNG conversion/ installation.
2. Conversion/installation of gasoline vehicle to CNG.
3. Practice CNG safety precautions and procedures.

Course Objectives

	Objectives
Objective 1	Prepare vehicle for conversion according to manufacturer's directions.
Objective 2	Install fuel supply container with mounting hardware, valving, shielding, fuel level indicator, and remote fill assembly as needed, using manufacturer's specifications and required local, state and federal regulations.

Objective 3	Determine appropriate location and mounting of the converter/regulator; install the converter/regulator using mounting brackets, fuel lock, fittings, starting aids, control valves, cooling lines, and thermostat as required and according to manufacturer's specifications.
Objective 4	Install fuel injection/carburetion or other fuel control components according to manufacturer's instructions.
Objective 5	Inspect and test each installed component to ensure it is connected and positioned in a safe and effective manner.
Objective 6	Complete and affix required safety/information labels.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Inspect the vehicle for pre-existing conditions that may adversely affect the performance of the vehicle and document.
Outcome 2	Install compressed natural gas (CNG) fuel system using manufacturer instructions and industry guidelines, specifications and required local, state and federal regulations.
Outcome 3	Inspect and test each installed component to ensure it is connected and positioned in a safe and effective manner.
Outcome 4	Test vehicle for acceptable driveability and operation (on each fuel for dual fuel vehicles).

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
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.
Technology-based instruction	Diagnostic equipment based activities.
Lecture	Each class is half lecture covering multiple aspects of course content.
Discussion	Student will participate in classroom discussions.
Observation	Student will be observed in activities in lab, group activities, information research collaborative assignments, and other activities assigned.
Collaborative/Team	Student will work in a team setting shile 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 provided material. Homework from provided material; multiple-choice questions, fill in the blank and essay questions to be graded each week.	In Class Only
Student participation/contribution	Lab activities and student may participate in role play activities.	In Class Only
Mid-term and final evaluations	Used to evaluate student's knowledge and understanding of the informtion presented. Examples of these are not limited to quizzes, exams, presentations, research or projects.	In Class Only
Laboratory projects	Student will participate in lab based activities to complete their NATEF standards job sheets.	In Class Only
Reading reports	Turned in by report, written presentation, however the student is required to research information pertaining to the assignment.	In 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.	In Class Only
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 books.
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. Step-by-step discussion of CNG installation/conversion including state and federal regulations and safety.

Other Out-of-class Assignments

1. Research using online service information and OEM information.
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.
6. Must complete a course project consisting an essay describing, analyzing and summarizing a selected topic, including out of class research and fieldwork.
7. Hands-on lab worksheets matching each course objective.
8. 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
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 required to meet the objectives and outcomes 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
CCC000611540