

AUTO 041B: CNG INSTALLATION & REPAIR

Originator

dredman

Co-Contributor(s)**Name(s)**

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Justification / Rationale

The Automotive Faculty are reviewing and/or updating this course to assure compliance with local, State, and Federal regulations; support consistency within the curriculum; practice relevance regarding automotive industry and community; and to make improvements that will strengthen the learning environment this course creates thus benefiting the learners.

Effective Term

Fall 2022

Credit Status

Credit - Degree Applicable

Subject

AUTO - Automotive Technology

Course Number

041B

Full Course Title

CNG Installation & Repair

Short Title

CNG INSTALL & REPAIR

Discipline**Disciplines List**

Automotive Technology

Modality

Face-to-Face

Hybrid

Catalog Description

This course is designed to introduce students to CNG installation and basic service and repair. The following topics are covered in this course: gaseous fuel safety, CNG conversion advantages and disadvantages, and service of CNG conversions.

Schedule Description

This class is designed to introduce students to Compressed Natural Gas (CNG) installation and basic service and repair. The following topics are covered in this course: gaseous fuel safety, CNG conversion, advantages and disadvantages, and service of CNG conversions.

Lecture Units

2

Lecture Semester Hours

36

Lab Units

1

Lab Semester Hours

54

In-class Hours

90

Out-of-class Hours

72

Total Course Units

3

Total Semester Hours

162

Required Text and Other Instructional Materials**Resource Type**

Web/Other

Description

Instructor handouts.

Resource Type

Book

Open Educational Resource

No

Author

National Fire Protection Association (NFPA)

Title

NFPA 52

Edition

2019

Year

2019

College Level

Yes

Flesch-Kincaid Level

13

Class Size Maximum

21

Course Content

1. Gaseous fuel installation (GFI) regulations.
2. Cost and benefit analysis of GFI.
3. Employment at an original equipment manufacturer vs. an up-fitter.
4. Safety issues with gaseous fuel vehicles and installations, SP2.
5. Gaseous fuel theory and system functions and operation.
6. Unique issues with repair of GFI.

Lab Content

1. Safety activities related to gaseous fuel vehicles (GFV).
2. Work in groups to perform GFV repairs.
3. Work in groups to install a gaseous fuel system on a vehicle.

4. Repair gaseous fuel system concern.
5. Gaseous fuel vehicle equipment and service information usage.

Course Objectives

Objectives	
Objective 1	Demonstrate proper practice of gaseous fuel vehicle safety, SP2.
Objective 2	Describe how to install a gaseous fuel system on a liquid fuel vehicle.
Objective 3	Work as a team to install a gaseous fuel system.
Objective 4	Demonstrate ability to properly bend tubing required for a gaseous fuel system.
Objective 5	Demonstrate ability to locate and apply installation and repair procedures based on industry standard service manuals, service bulletins, repair bulletin boards, automotive textbooks, and appropriate internet information.

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 installing a gaseous fuel system.
Outcome 2	Practice proper inspection, diagnostic, repair, and maintenance skills given a gaseous fuel system which was installed by an up-fitter, using the proper diagnostic and repair tools, in a team setting.
Outcome 3	Demonstrate shop safety practices, given an automotive shop environment, a vehicle which must have a gaseous fuel system installed, with related service parts and fluids.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Lecture	Safety, theory, operation, installation and repair of gaseous fuel vehicles.
Laboratory	Installation and repair of gaseous fuel system.
Collaborative/Team	Lab activities and exam study guides.
Technology-based instruction	Diagnostic test equipment, computer-based tools, and virtual reality scenarios.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Laboratory projects	Installation and verification tasks on a gaseous fuel vehicle.	In Class Only
Mid-term and final evaluations	Two exams based on lecture and lab activities.	In and Out of Class
Group activity participation/observation	Lab activities.	In Class Only
College level or pre-collegiate essays	Research paper and for homework on gaseous fuel vehicles.	In and Out of Class

Assignments

Other In-class Assignments

1. Create lecture notes.
2. Analyze course material and create presentations.
3. Demonstrate proficiency in course material so as to successfully complete quizzes and exams.
4. System diagram analysis.
5. Practice proper repair information research procedures.
6. Practice respectful discussion/participation in problem solving scenarios.

Other Out-of-class Assignments

1. Homework from text. (2hrs per week)
2. Research projects. (8hrs total)
3. Quizzes and exams. (1/2hr per week)

4. SP2 safety training. (3hrs total)
5. Automotive industry manufacturer web training. (1hr per week)
6. Readings from the text. (1hr per week)

Grade Methods

Letter Grade Only

Distance Education Checklist

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

Online %

50

On-campus %

50

Lab Courses**How will the lab component of your course be differentiated from the lecture component of the course?**

Lab component of the course will be completed in a laboratory environment on campus under the supervision of an appropriate facilitator and will be comprised of hands-on activities.

From the COR list, what activities are specified as lab, and how will those be monitored by the instructor?

The facilitator will supervise all lab content, guiding the learner in productivity and understanding.

How will you assess the online delivery of lab activities?

Laboratory activities will not be delivered in the online setting, only in person.

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?**

SP2 online safety training.

If used, explain how specific materials and resources outside the LMS will be used to enhance student learning.

SP2 - free account provided to all used to ensure the learners ability to distinguish safe working practices and conditions from unsafe practices and conditions.

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

For hybrid courses:

Field trips

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

Credit Course

Approved Special Class

Not special class

Noncredit Category

Not Applicable, Credit Course

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Transferable to CSU only

General Education Status

Y = Not applicable

Support Course Status

N = Course is not a support course

Allow Audit

Yes

Repeatability

No

Materials Fee

No

Additional Fees?

No

Approvals**Curriculum Committee Approval Date**

3/17/2022

Academic Senate Approval Date

3/24/2022

Board of Trustees Approval Date

4/22/2022

Chancellor's Office Approval Date

05/07/2022

Course Control Number

CCC000631450

Programs referencing this course

Automotive Light and Medium Duty Diesel Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=111>)
Automotive Steering, Suspension, Alignment Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=112>)
Automotive Introductions Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=201>)
Advanced Transportation Technologies AS Degree (<http://catalog.collegeofthedesert.eduundefined/?key=44>)
Advanced Transportation Technologies AS Degree (<http://catalog.collegeofthedesert.eduundefined/?key=45>)