AUTO 011C: ADVANCED AUTOMOTIVE ELECTRICAL SYSTEMS

Date Submitted:Thu, 06 Sep 2018 15:49:13 GMT

Originator

doanderson

Justification / Rationale

Periodic review of this course indicated lecture and lab hour reduction to fit student needs. No changes to content or lab activities at this time.

Effective Term

Fall 2019

Credit Status

Credit - Degree Applicable

Subject

AUTO - Automotive Technology

Course Number

011C

Full Course Title

Advanced Automotive Electrical Systems

Short Title

ADV AUTO ELEC

Discipline

Disciplines List
Automotive Technology

Modality

Face-to-Face

Catalog Description

This course provides theory and hands-on experience in intermediate to advanced automotive body electricity circuits and systems including body control computers, bus communication, multiplexing, instrument panel circuits and an introduction to passive restraint systems. There is a hands-on emphasis focusing on diagnosing, trouble-shooting and repairing intermediate to advanced body electrical system malfunctions. A uniform is required for this course.

Schedule Description

This class provides lecture/discussion and hands on experience understanding, servicing, troubleshooting, diagnosing and repairing intermediate to advanced automotive body electrical systems and common malfunctions. Prerequisite: AUTO 011B Advisory: RDG 061

Lecture Units

3

Lecture Semester Hours

54

Lab Units

1

Lab Semester Hours

54

In-class Hours

108

Out-of-class Hours
108

Total Course Units
4

Total Semester Hours
216

Prerequisite Course(s)
AUTO 011B
Advisory: RDG 061

Required Text and Other Instructional Materials

Resource Type
Book

Author
Duffy, James

Title
Auto Electricity and Electronics

Edition
6th

Publisher
Goodheart-Willcox

Year
2014

College Level
Yes

Flesch-Kincaid Level
13

ISBN #
978-1-61-960-747-7

Resource Type
Book

Author
Chris Johnson

Title
NATEF Standards Job Sheets for Performance Based Learning

Edition
9th

Publisher
G-W

Year
2015

College Level
Yes

Flesch-Kincaid Level
13

ISBN #
978-1-63126-378-1

Resource Type
Book

Author
James Duffy, Nancy Henke-Konopasek

Title
Auto Electricity and Electronics Workbook

Edition
6th

Publisher
Goodheart-Willcox

Year
2014

College Level
Yes

Flesch-Kincaid Level
13

ISBN #
978-1-61960-753-8

Class Size Maximum
21

Entrance Skills
Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

Prerequisite Course Objectives
AUTO 011B-Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

Entrance Skills
Identify and interpret electrical/electronic system concern; determine necessary action.

Prerequisite Course Objectives
AUTO 011B-Identify and interpret electrical/electronic system concern; determine necessary action.

Entrance Skills
Research applicable vehicle and service information, such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins.

Prerequisite Course Objectives
AUTO 011B-Research applicable vehicle and service information, such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins.

Entrance Skills

Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals).

Prerequisite Course Objectives

AUTO 011B-Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals).

Entrance Skills

Use wiring diagrams during diagnosis of electrical circuit problems.

Prerequisite Course Objectives

AUTO 011B-Use wiring diagrams during diagnosis of electrical circuit problems.

Entrance Skills

Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems

Prerequisite Course Objectives

AUTO 011B-Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems.

Entrance Skills

Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; perform necessary action.

Prerequisite Course Objectives

AUTO 011B-Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; perform necessary action.

Entrance Skills

Perform battery state-of-charge test; determine necessary action

Prerequisite Course Objectives

AUTO 011B-Perform battery state-of-charge test; determine necessary action.

Entrance Skills

Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action.

Prerequisite Course Objectives

AUTO 011B-Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; perform necessary action.

Entrance Skills

Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions

Prerequisite Course Objectives

AUTO 011B-Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions.

Entrance Skills

Use various reading strategies to prepare, read and comprehend expository text

Prerequisite Course Objectives

RDG 061-Use SQ3R /or SOAR along with outlining, note-taking, mapping summarizing and other strategies to prepare, read, comprehend expository text.

Entrance Skills
Read a variety of texts fluently.

Prerequisite Course Objectives
RDG 061-Read a variety of texts fluently.

Entrance Skills
Write organized summaries reactions that capture main idea and supporting details.

Prerequisite Course Objectives
RDG 061-Write organized summaries reactions that capture main idea and supporting details.

Entrance Skills
Understand multiple word meanings, uses synonyms

Prerequisite Course Objectives
RDG 061-Understand multiple word meanings, uses synonyms

Course Content
1. Review of AUTO-011B material
2. Body computer systems
3. Vehicle communication networks
4. Advanced electrical accessories
5. Instrument panel and warning lamps
6. Introduction to passive restraint systems
7. Introduction to automobile alternative power sources
8. Chrysler web-based training modules.

Lab Content
1. Overview, safety & environmental protection
2. Review of AUTO-011B material; lab activities
3. Identify body computer systems on the vehicle
4. Diagnose and repair vehicle communication networks
5. Diagnose and repair advanced electrical accessories
6. Diagnose and repair instrument panel and warning lamps
7. Diagnose and repair passive restraint systems
8. Required tasks to meet NATEF 2017 MAST standards

Course Objectives

	Objectives
Objective 1	Repair wiring harness (including CAN/BUS systems).
Objective 2	Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action.
Objective 3	Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action.
Objective 4	Identify system voltage and safety precautions associated with high intensity discharge headlights.
Objective 5	Inspect and test gauges and gauge sending units for cause of intermittent, high, low, or no gauge readings; determine necessary action.
Objective 6	Decipher the cause of incorrect operation of warning devices and other driver information systems; determine necessary action.
Objective 7	Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action.
Objective 8	Diagnose incorrect horn operation; perform necessary action.
Objective 9	Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action.
Objective 10	Diagnose incorrect electric lock operation; determine necessary action.

Objective 11	Diagnose supplemental restraint system (SRS) concerns; determine necessary action. (Note: Follow manufacturer's safety procedures to prevent accidental deployment.)
Objective 12	Diagnose body electronic system circuits using a scan tool; determine necessary action.
Objective 13	Deduce module communication (including CAN/BUS systems) errors using a scan tool.
Objective 14	Hypothesize false, intermittent, or no operation of anti-theft systems failures.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Demonstrate shop safety practices .
Outcome 2	Diagnose and repair intermediate to advanced level foundational electrical system malfunctions.
Outcome 3	Student will work in a team setting to formulate a proper diagnosis or repair
Outcome 4	Reference service information and document repairs.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Discussion	Weekly discussion board may be posted
Demonstration, Repetition/Practice	Repair orders during lab assignments
Collaborative/Team	While working in the lab, students will complete their assignments in teams
Lecture	Content pertaining to subject material will be covered in a lecture atmosphere.
Laboratory	Information covered in lecture is practiced in a lab setting

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
College level or pre-collegiate essays	Book report, verbal presentations, or other research project may be assigned buy the instructor	Out of Class Only
Student participation/contribution	Students are required to complete assigned lab assignments	In Class Only
Mid-term and final evaluations	Quizzes or exams	In and Out of Class
True/false/multiple choice examinations	Chapter homework,quizzes or exams	In and Out of Class
Group activity participation/observation	Lab activities	In and Out of Class
Presentations/student demonstration observations	Book report, verbal presentations, or other research project may be assigned buy the instructor	In and Out of Class
Laboratory projects	Lab activities	In Class Only
Written homework	Chapter homework assignments	Out of Class Only

Assignments

Other In-class Assignments

1. Review homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week.
2. Begin 2 SP2 safety tests.
3. Students may be required to take notation of important course content to incorporate into required notebook
4. Participation in discussion related to topic of lecture.
5. Students must keep a notebook of all course materials including homework, class notes, handouts, class project and team activities. The notebook must be organized by chapter, in-class notes, handouts and extra-credit assignments. The notebook will be evaluated after the half-way point and graded at the end of the course.
6. Review and discuss vehicle diagnosis, troubleshooting and repair of personal, shop and other vehicles to be evaluated by the instructor during lab time.
7. Students will participate in group activities including, but not limited to role play, repair orders and interacting with customers.

8. Must develop teamwork skills through classroom interaction and discussion.
9. Students will work in a team environment while performing assigned lab or classroom activities.

Other Out-of-class Assignments

1. Readings from required text: Assigned chapter reading from book and/or research based information.
2. Homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week.
3. Completion of 2 SP2 safety tests. Mechanical safety, Pollution prevention.
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. Students must keep a notebook of all course materials including homework, class notes, handouts, class project and team activities. The notebook must be organized by chapter, in-class notes, handouts and extra-credit assignments. The notebook will be evaluated after the half-way point and graded at the end of the course.
8. Vehicle diagnosis, troubleshooting and repair of personal, shop and other vehicles to be evaluated by the instructor during lab time.
9. Hands-on lab worksheets matching each course objective. These will be graded by the instructor throughout the semester during lab time.
10. Must develop teamwork skills through lab activities and assigned special projects.
11. Chrysler web-based training modules assigned and completed outside the class. Each module required a minimum of two hours.
12. A verbal or written presentation based from outside research pertaining to course content may be assigned by the instructor.

Grade Methods

Letter Grade Only

MIS Course Data

CIP Code

47.0604 - Automobile/Automotive Mechanics Technology/Technician.

TOP Code

094800 - Automotive Technology

SAM Code

B - Advanced 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
Not transferable

Allow Audit
Yes

Repeatability
No

Materials Fee
No

Additional Fees?
No

Approvals

Curriculum Committee Approval Date
11/6/2018

Academic Senate Approval Date
11/29/2018

Board of Trustees Approval Date
12/14/2018

Chancellor's Office Approval Date
1/07/2019

Course Control Number
CCC000599872

Programs referencing this course
Automotive Air Conditioning Certificate of Achievement (http://catalog.collegeofthedesert.eduundefined?key=104)
Automotive Electrical Certificate of Achievement (http://catalog.collegeofthedesert.eduundefined?key=105)
Hybrid, Fuel Cell, Electric Vehicle (http://catalog.collegeofthedesert.eduundefined?key=198)
Advanced Transportation Technologies AS Degree (http://catalog.collegeofthedesert.eduundefined?key=44)
Advanced Transportation Technologies AS Degree (http://catalog.collegeofthedesert.eduundefined?key=45)
Automotive Technology AS Degree (http://catalog.collegeofthedesert.eduundefined?key=57)