

AUTO 016: AUTOMOTIVE MANUAL TRANSMISSIONS & DRIVE TRAIN SYSTEMS

Originator

doanderson

Justification / Rationale

Addition to text book

Effective Term

Fall 2020

Credit Status

Credit - Degree Applicable

Subject

AUTO - Automotive Technology

Course Number

016

Full Course Title

Automotive Manual Transmissions & Drive Train Systems

Short Title

AUTO MANUAL TRANS

Discipline**Disciplines List**

Automotive Technology

Modality

Face-to-Face

Catalog Description

This course provides theory and hands-on experience in manual transmissions/transaxles including: theory of operation, service, diagnosis and repair. The course includes the following topics: clutches, axles, driveshafts, transfer cases, differentials, electrical controls, diagnosis, troubleshooting and partial disassembly and reassembly. A \$20.00 test fee for the appropriate Automotive Service Excellent (ASE) Student Exam is required. A uniform is required for this course.

Schedule Description

This class provides lecture/discussion and hands-on experience understanding, servicing, troubleshooting, diagnosing and repairing manual transmissions/transaxles. A \$20.00 test fee for the appropriate Automotive Service Excellent (ASE) Student Exam is required. A uniform is required for this course.

Prerequisite: AUTO 010 or concurrent enrollment

Advisory: RDG 061, ENG 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 010 or concurrent enrollment

Advisory: RDG 061, ENG 061

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

Book

Author

Chris Johanson

Title

Modern Automotive Technology NATEF Standards Job Sheets for Performance-Based Learning

Edition

9th

Publisher

G-W

Year

2017

College Level

Yes

Flesch-Kincaid Level

13

ISBN #

9781631263781

Resource Type

Book

Author

Chris Johanson

Title

Manual Drive Trains and Axles Workbook

Edition

3rd

Publisher

Goodheart-Willcox

Year

2015

College Level

Yes

Flesch-Kincaid Level

13

ISBN #

9781619607033

Resource Type

Book

Author

Chris Johanson

Title

Manual Drive Trains and Axles

Edition

3rd

Publisher

Goodheart-Willcox

Year

2015

College Level

Yes

Flesch-Kincaid Level

13

ISBN #

9781619606999

Resource Type

Web/Other

Description

1. Safety glasses meeting ANSI Z87.1
2. Three ring binder

Resource Type

Web/Other

Year

2021

Description

The current book is available in digital format and this is going to be offered to the students
2 Year Individual Access Key Code – 978-1-64564-558-0

Class Size Maximum

21

Entrance Skills

Describe shop safety practices.

Requisite Course Objectives

AUTO 010-Describe shop safety practices and proper procedures regarding handling hazardous material.

Entrance Skills

Identify basic automotive tools and equipment.

Requisite Course Objectives

AUTO 010-Identify basic automotive tools and equipment.

Entrance Skills

Locate applicable vehicle service specifications and procedures using the latest online service information.

Requisite Course Objectives

AUTO 010-Locate applicable vehicle service specifications and procedures using the latest online service information.

Entrance Skills

Properly complete a repair order including all pertinent information and compliant, cause and correction

Requisite Course Objectives

AUTO 010-Properly position and lift a vehicle using a floor jack and jack stands and a vehicle hoist.

Entrance Skills

Locate and interpret key vehicle identification information.

Requisite Course Objectives

AUTO 010-Locate and interpret key vehicle identification information.

Entrance Skills

Work together in a team setting.

Requisite Course Objectives

AUTO 010-Display team work.

Entrance Skills

ADVISORY SKILLS:

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

Requisite 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

Requisite Course Objectives

RDG 061-Read a variety of texts fluently.

Entrance Skills

Write organized summaries reactions that capture main idea and supporting details

Requisite Course Objectives

ENG 061-Use theses to organize paragraphs into coherent analyses.

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

Entrance Skills

Understand multiple word meanings, uses synonyms

Requisite Course Objectives

ENG 061-Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

RDG 061-Understand multiple word meanings, uses synonyms

Course Content

1. Orientation, safety & environmental protection
2. Hand tools, special service tools and shop equipment
3. Automotive repair industry terms and conventions
4. Drive train theory of operation
5. Clutches
6. Manual transmissions/transaxles
7. Front and rear drive shafts and axles
8. Differentials
9. Four-wheel drive systems
10. Diagnosis, troubleshooting and repair
11. 4WD/AWD control systems
12. Chrysler web-based training modules

Lab Content

1. Safety & environmental protection
2. Identify drive train components on a vehicle
3. Diagnose, service and repair clutch concerns
4. Diagnose, service and repair manual transmission/transaxle concerns
5. Diagnose, service and repair front and rear drive shaft and axle concerns
6. Diagnose, service and repair differential concerns
7. Diagnose, service and repair four-wheel drive system concerns
8. Required tasks to meet NATEF 2017 MAST standards

Course Objectives

	Objectives
Objective 1	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
Objective 2	General: Drive Train Diagnosis
Objective 3	Clutch Diagnosis and Repair
Objective 4	Transmission/Transaxle Diagnosis and Repair
Objective 5	Drive Shaft and Half Shaft, Universal and Constant-Velocity (CV) Joint Diagnosis and Repair (Front, Rear, All-Wheel, and Four-Wheel Drive)
Objective 6	Drive Axle Diagnosis and Repair and Ring and Pinion Gears and Differential Case Assembly
Objective 7	Limited Slip Differential
Objective 8	Drive Axles
Objective 9	Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair
Objective 10	Tools, equipment, shop and Personal Safety

Student Learning Outcomes

Upon satisfactory completion of this course, students will be able to:	
Outcome 1	Demonstrate shop safety practices while working in a team setting.
Outcome 2	Diagnose and repair intermediate to advanced level for manual drive train and transfer case concerns .
Outcome 3	Demonstrate proficiency in referencing service information while exhibiting the ability to inspect/perform maintenance on transfer case and manual drive train systems and documenting repairs.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Discussion	Student will participate in classroom discussions.
Technology-based instruction	Diagnostic equipment based activities.
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.
Collaborative/Team Participation	Student will work in a team setting while performing lab activities.
Observation	Student will participate in, but not limited to, classroom activities, research activities, role-play, interactive testing.
Lecture	Students will perform assigned lab activities.
Laboratory	Each class is half lecture covering multiple aspects of course content.
	Student will participate in lab based activities to complete their National Automotive Technicians Education Foundation (NATEF) standards job sheets.

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	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
Reading reports	Turned in by report, 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 role play activities, or presentation.	In Class Only
Mid-term and final evaluations	Review of homework. Lab activity evaluations. Written and hands-on exams.	In and Out of Class
Group activity participation/observation	Lab activities and student may participate in role play activities.	In and Out of Class
Presentations/student demonstration observations	Student may participate in role play activities and be required to do a visual presentation.	In and Out of Class
Laboratory projects	Student will participate in lab based activities to complete their National Automotive Technicians Education Foundation (NATEF) standards job sheets.	In Class Only
Written homework	Readings from required text: 1-3 chapters per week from both classroom and shop manuals. Homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week.	Out of Class Only

Assignments
Other In-class Assignments

Review homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week.

1. Begin SP2 safety tests.
2. Notes on lecture.
3. Participation in discussion related to topic of lecture.
4. 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.
5. Review and discuss vehicle diagnosis, troubleshooting and repair of personal, shop and other vehicles to be evaluated by the instructor during lab time.
6. Must develop teamwork skills through classroom interaction and discussion.

Other Out-of-class Assignments

1. Readings from required text: 1-3 chapters per week from both classroom and shop manuals. Each chapter 2 hours per week.
2. Homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week. Each chapter 2 hours per week.
3. Completion of 2 SP2 safety tests, each subject including an average of 4 hours
 - a. Mechanical Safety
 - b. Pollution prevention
4. Assigned readings and written summaries from selected instructor handouts. 1 hour
5. Written summaries and analysis of assigned websites.
6. Must complete a course project consisting of an essay describing, analyzing and summarizing a selected topic, including out of class research and fieldwork. 8 hours
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, each taking roughly 3 hours.
12. Exam prep. 12 hours

Grade Methods

Letter Grade Only

MIS Course Data**CIP Code**

47.0604 - Automobile/Automotive Mechanics Technology/Technician.

TOP Code

094800 - Automotive 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

Not transferable

General Education Status

Not applicable

Support Course Status

Course is not a support course

Allow Audit

No

Repeatability

No

Materials Fee

No

Additional Fees?

Yes

Additional Fee Amount

\$20.00

Additional Fees Description

Automotive Service Excellent (ASE) Student Exam

Approvals**Curriculum Committee Approval Date**

3/03/2020

Academic Senate Approval Date

3/12/2020

Board of Trustees Approval Date

5/15/2020

Course Control Number

CCC000455024

Programs referencing this course

Automotive Air Conditioning Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=104/>)
Automotive Transmission Axle Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=108/>)
Automotive Braking Systems Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=109/>)
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/>)
Automotive Technology AS Degree (<http://catalog.collegeofthedesert.eduundefined?key=57/>)