

AUTO 015: AUTOMOTIVE ENGINE DIAGNOSIS & REPAIR

Originator

dredman

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

Anderson, Dorothy

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

015

Full Course Title

Automotive Engine Diagnosis & Repair

Short Title

ENGINE DIAG & REPAIR

Discipline**Disciplines List**

Automotive Technology

Modality

Face-to-Face

Hybrid

Catalog Description

This course provides theory and hands-on experience in automotive engine mechanical systems including: theory of operation, service, diagnosis and repair including the following topics: valve train components and procedures, engine block components and procedures, disassembly and reassembly skills and engine mechanical troubleshooting tests. 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 engine mechanical systems. 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

Lecture Units

2.5

Lecture Semester Hours

45

Lab Units

1.5

Lab Semester Hours

81

In-class Hours

126

Out-of-class Hours

90

Total Course Units

4

Total Semester Hours

216

Prerequisite Course(s)

AUTO 010 or concurrent enrollment

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

Book

Open Educational Resource

No

Author

Various

Title

ASE Automotive Suite (Text, shop manual, and workbook for all 8 ASE automotive categories)

Edition

7th

City

Tinley Park, Illinois

Publisher

Goodheart Wilcox

Year

2021

College Level

Yes

Flesch-Kincaid Level

11.4

ISBN #

978-1-64564-559-7

Class Size Maximum

24

Entrance Skills

Understanding of safety practices.

Requisite Course Objectives

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

Entrance Skills

Knowledge of basic automotive tools and equipment.

Requisite Course Objectives

AUTO 010-Identify basic automotive tools and equipment.

Entrance Skills

Working knowledge of 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

Ability to complete a repair order.

Requisite Course Objectives

AUTO 010-Properly complete a repair order including all pertinent information and compliant, cause and correction.

Entrance Skills

Able to safely lift a vehicle using a floor jack and jack stands and a vehicle hoist.

Requisite Course Objectives

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

Entrance Skills

Able to locate and interpret key vehicle identification information.

Requisite Course Objectives

AUTO 010-Locate and interpret key vehicle identification information.

Entrance Skills

Work well with a team.

Requisite Course Objectives

AUTO 010-Display team work.

Course Content

1. SP2 safety.
2. Theory of engine operation.
3. Engine materials and components.
4. Cylinder heads.
5. Camshafts and valve trains.
6. Engine timing.
7. Cylinder block and components.
8. Engine repair skills.
9. Engine service.
10. Engine diagnosis, troubleshooting and repair.
11. Automotive industry web-based training modules.

Lab Content

1. Safety & environmental protection.
2. Identify engine materials and components.
3. Diagnose and repair cylinder head concerns.

4. Diagnose and repair camshafts and valve train concerns.
5. Set engine timing.
6. Diagnose and repair cylinder block and component concerns.
7. Perform basic engine services.
8. Required tasks to meet the Automotive Service Excellence (ASE) 2017 Master Automotive Service Technician (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 per California state regulations including Technical Service Bulletins (TSB).
Objective 2	Learners will evaluate engine failures by following manufacturer provided diagnostic procedures including mechanical fault, including vibration, excessing noise and determine appropriate steps to diagnosis and repair the concern.
Objective 3	Learners will disassemble the automotive engine, identify worn/damaged parts, clarify needed actions and assemble the engine per manufacturers procedures.
Objective 4	The learners must complete the required tasks to meet the Automotive Service Excellence (ASE) 2017 Master Automotive Service Technician (MAST) standards.
Objective 5	Successfully complete SP2 safety training.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Demonstrate shop safety practices, given an automotive shop environment, a vehicle being diagnosed and/or serviced, with related service parts and fluids.
Outcome 2	Describe the top 10 mechanical engine faults, needed service, and procedures for repair as well as the process to discover the root cause of the system at fault.
Outcome 3	Demonstrate proficiency in referencing service information and documenting repairs, while practicing shop safety and teamwork when servicing and repairing engine mechanical concerns.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Discussion	Learners may participate in role play activities.
Technology-based instruction	Diagnostic test equipment, computer-based tools, and virtual reality scenarios.
Demonstration, Repetition/Practice	Lab activities and learners may participate in role play activities.
Collaborative/Team	Learners will work in a team setting while performing lab activities.
Participation	Student will work in a team setting while performing lab activities.
Observation	Learners will be observed conducting activities in lab, group activities, information research, collaborative assignments, and other activities assigned.
Lecture	Each class is half lecture covering multiple aspects of course content.
Laboratory	Learners will participate in lab-based activities to complete their ASE 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	Learners may be required to complete a research paper.	Out of Class Only
Student participation/contribution	Lab activities and student may participate in role play activities.	In and Out of Class
Mid-term and final evaluations	Used to evaluate students' 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

Product/project development evaluation	Learners may participate in role play activities and be required to do a visual presentation.	In and Out of Class
Group activity participation/observation	Learners may participate in role play activities.	In and Out of Class
Presentations/student demonstration observations	Learners may participate in role play activities and be required to do a visual presentation.	In and Out of Class
Laboratory projects	Learners will participate in lab based activities to complete their ASE standards job sheets.	In Class Only
Term or research papers	Learners may be required to complete a research paper.	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

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 3 SP2 safety tests.
3. Notes on lecture.
4. Participation in discussion related to topic of lecture.
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 3 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.
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. 5 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. Notebooks 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. Automotive industry web-based training modules, each taking roughly 3 hours.
12. Exam prep, 12 hours.

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 instructor

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

The lab content is comprised of the required tasks to meet the Automotive Service Excellence (ASE) 2017 Master Automotive Service Technician (MAST) standards.

How will you assess the online delivery of lab activities?

Lab assignments will be completed on campus with instructor

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:

- Chat room/instant messaging
- Discussion forums with substantive instructor participation
- Online quizzes and examinations
- Private messages
- Regular virtual office hours
- Timely feedback and return of student work as specified in the syllabus
- Video or audio feedback
- Weekly announcements

External to Course Management System:

- Direct e-mail
- Teleconferencing

For hybrid courses:

- Orientation, study, and/or review sessions
- Scheduled Face-to-Face group or individual meetings

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

47.0604 - 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

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?

Yes

Additional Fee Amount

\$20.00

Additional Fees Description

Automotive Service Excellent (ASE) Student Exam

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

5/06/2022

Course Control Number

CCC000631394

Programs referencing this course

Automotive Air Conditioning Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=104>)

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>)