Course Number and Title: AUT 203 Automotive Engine Repair

Campus Location:
Georgetown, Stanton

Effective Date:
2021-51

Prerequisite:
AUT 102, AUT 103, AUT 104

Co-Requisites:
None

Course Credits and Hours:
4.00 credits
2.00 lecture hours/week
6.00 lab hours/week

Course Description:
This course introduces various automotive engines and related components, their operations and service and repair procedures. Laboratory activities include hands-on exercises on trainer/dead engines relating to the operation, servicing, and repair of the engines as well as related engine systems: cooling, lubrication, exhaust, and related systems. Students also perform live engine evaluation and diagnosis.

Required Text(s):
Obtain current textbook information by viewing the campus bookstore - https://www.dtcc.edu/bookstores online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
Safety glasses

Schedule Type:
Classroom Course

Disclaimer:
None

Core Course Performance Objectives (CCPOs):

1. Evaluate various engine designs. (CCC 1, 2, 3, 4, 5, 6; PGC 1, 2, 3, 4, 5)
2. Analyze and service cylinder head and valve train components. (CCC 1, 2, 3, 4, 5, 6; PGC 1, 2, 3, 4, 5)
3. Analyze and service automotive lubrication and cooling systems. (CCC 1, 2, 3, 4, 5, 6; PGC 1, 2, 3, 4, 5)
4. Analyze and repair engine mechanical concerns. (CCC 1, 2, 3, 4, 5, 6; PGC 1, 2, 3, 4, 5)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):
Upon completion of this course, the student will:

1. Evaluate various engine designs.
    1. Explain various engine design operations and services.
    2. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
    3. Research applicable vehicle and service information, including fluid type, internal engine operation, vehicle service history, service precautions, technical service bulletins, and adhere to simulated shop procedures.
    4. Verify operation of the instrument panel engine warning indicators.
    5. Inspect engine assembly for fuel, oil, coolant, and other leaks; and determine needed action.
    6. Evaluate crankshaft vibration damper to determine necessary action.
    7. Evaluate engine mounts, and determine necessary action.

2. Analyze and service cylinder head and valve train components.
    1. Remove, inspect, and reinstall/replace cylinder head, and determine necessary action.
    2. Install cylinder head covers using gaskets, seals, and sealers as required.
    3. Diagnose a cylinder head for cracks, gasket surface areas for warpage to determine necessary action.
    4. Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); and determine needed action.
    5. Perform valve lash adjustment.
    6. Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing components; and verify correct camshaft timing.
    7. Verify camshaft position sensor indexing.
    8. Verify engine mechanical timing.

3. Analyze and service automotive lubrication and cooling systems.
    1. Verify proper coolant condition and level.
    2. Evaluate cooling system components to determine needed action.
    3. Diagnose causes of engine overheating.
    4. Inspect, replace, and/or adjust drive belts, tensioners, and related components.
    5. Perform cooling system pressure and dye tests to identify leaks.
    6. Perform flush and refill of cooling system using proper fluid type.
    7. Perform water pump removal/replacement.
    8. Perform radiator removal/replacement.

4. Analyze and repair engine mechanical concerns.
    1. Diagnose engine performance concerns to determine needed action.
    2. Diagnose abnormal engine noises or vibration concerns to determine needed action.
    3. Diagnose the cause of excessive oil consumption, coolant consumption, unusual exhaust color, odor, and sound to determine needed action.
    4. Test engine absolute manifold pressure to determine needed action.
    5. Perform cylinder power balance test to determine needed action.
    6. Perform cylinder cranking and running compression tests to determine needed action.
    7. Perform cylinder leakage test to determine needed action.
    8. Diagnose engine mechanical concerns to determine needed action.
    9. Verify engine operating temperature and determine needed action.
    10. Verify correct camshaft timing to determine needed repairs

Evaluation Criteria/Policies:
The grade will be determined using the Delaware Tech grading system:

90	**–**	**100**	**=**	**A**
80	**–**	**89**	**=**	**B**
70	**–**	**79**	**=**	**C**
0	**–**	**69**	**=**	**F**

Students should refer to the Student Handbook - https://www.dtcc.edu/handbook for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Final Course Grade:
Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Summative - Minimum 4 Tests (equally weighted)	20%
Summative - Minimum 7 Quizzes (equally weighted)	20%
Summative/Formative – Minimum 10 Repair Orders/Worksheets (equally weighted)	30%
Summative Assessments - Minimum 2 Practical Assessments (equally weighted)	30%
TOTAL	100%

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Use appropriate automotive diagnostic and service equipment, hand tools, and precision measuring devices to determine and perform the proper repair as necessary.
2. Interpret automotive electronic service information, service manuals, and diagnostic charts.
3. Document service repair procedures that accurately reference the 3Cs:
    1. Customer complaint verification
    2. Correct the problem
    3. Complete the repair
4. Employ proper automotive industry service facility safety practices.
5. Practice professional conduct as required in the automotive industry.

Disabilities Support Statement:
The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the disabilities services - https://www.dtcc.edu/disabilitysupport web page or visit the campus Advising Center.