

COURSE SYLLABUS

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| LAST REVIEW | Fall 2022 |
| COURSE TITLE | Undercar Maintenance |
| COURSE NUMBER | AUTT-0131 |
| DIVISION | Career and Technical Education |
| DEPARTMENT | AUTT |
| CIP CODE | 47.0604 |
| CREDIT HOURS | 2 |
| CONTACT HOURS/WEEK | Class: 1 Lab: 2 |
| PREREQUISITES | AUTT-0103 |
| COREQUISITES | None |
| COURSE PLACEMENT | None |

COURSE DESCRIPTION

In this course students will study and perform tasks from the National Automotive Technicians Education Foundation's (NATEF) Maintenance and Light Repair (MLR) Program. These studies include elements from general engine repair service, cylinder head and valve train diagnosis and repair, lubrication and cooling system service, and heating and A/C system service. All students will successfully complete each element of personal safety training before working in the Automotive Laboratory.

PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:

https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. Demonstrate proper safety practices in an automotive shop environment.
2. Demonstrate workplace skills associated with a professional automotive shop.
3. Describe the fundamental elements of automotive technology including service information, tools, equipment, and maintenance procedures.

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels,

conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Engine Repair Service
 - A. Research service information
 - 1. Internal engine operation
 - 2. Vehicle service history
 - 3. Service precautions
 - 4. Technical Service Bulletins (TSB)
 - B. Oil and filter service
 - 1. Types of filters
 - 2. Types of oil
- II. Transmission Service
 - A. Fluid leaks
 - 1. Seals
 - 2. Gaskets
 - 3. Bushings
 - B. Checking fluid levels
 - 1. Dip stick
 - 2. Non dip stick
 - C. Inspection and adjustment of external valve shift linkage
 - 1. Range sensor/switch
 - 2. Park/neutral position switch
 - D. Drain and replace fluid and filters
 - E. Power train mounts
 - F. Hybrid vehicle
 - 1. Safety
 - 2. Operation
 - 3. Characteristics
- III. Manual Axle and Drive Train Service
 - A. Fluids
 - 1. Levels
 - 2. Conditions
 - 3. Types
 - B. Leaks
 - C. Drain and refill
 - 1. Manual transmission/transaxle
 - 2. Final drive unit
 - 3. Four wheel drive components
 - D. Clutch master cylinder fluid levels
 - 1. Check for leaks
 - 2. Design types
 - E. Electronically controlled transmissions

1. Characteristics
 2. Precautions
- IV. Drive Shaft and Joint Service
- A. Drive shaft
 - B. Half shaft
 - C. Constant velocity
 - D. Universal
 - E. Bearing service
 - F. Hubs
 - G. Seals
 - H. Yokes

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Perform basic engine repair service.
 1. Research applicable vehicle and service information, such as internal engine operation, vehicle service history, service precautions, and technical service bulletins.
 2. Demonstrate how to perform an engine oil and filter change.

- B. Perform basic transmission and transaxle service.
 3. Research applicable vehicle and service information fluid type, vehicle service history, service precautions, and technical service bulletins.
 4. Diagnose fluid loss and condition concerns; determine necessary action.
 5. Check fluid level in a transmission or a transaxle equipped with a dip- stick.
 6. Check fluid level in a transmission or a transaxle not equipped with a dip-stick.
 7. Inspect, adjust, and replace external manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch.
 8. Inspect for leakage; replace external seals, gaskets, and bushings.
 9. Drain and replace fluid and filter(s).
 10. Inspect, replace and align powertrain mounts.
 11. Describe the operational characteristics of a continuously variable transmission (CVT).
 12. Describe the operational characteristics of a hybrid vehicle drive train.

- C. Perform basic manual drive train and axle service.
 13. Research applicable vehicle and service information, fluid type, vehicle service history, service precautions, and technical service bulletins.
 14. Check fluid condition; check for leaks; determine necessary action.
 15. Drain and refill manual transmission/transaxle and final drive unit.
 16. Check and adjust clutch master cylinder fluid level; check for leaks.
 17. Describe the operational characteristics of an electronically-controlled manual transmission/transaxle.

- D. Perform basic drive shaft and half shaft, universal and constant-velocity (CV) joint service.
 - 18. Inspect, remove, and replace front wheel drive (FWD) bearings, hubs, and seals.
 - 19. Inspect, service, and replace shafts, yokes, boots, and universal/CV joints.

- E. Perform basic drive axle diagnostics and repair.
 - 20. Clean and inspect differential housing; check for leaks; inspect housing vent.
 - 21. Check and adjust differential housing fluid level.
 - 22. Drain and refill differential housing.
 - 23. Inspect and replace drive axle wheel studs.

- F. Perform basic four-wheel drive/all-wheel drive component and repair.
 - 24. Inspect front-wheel bearings and locking hubs; perform necessary action(s).
 - 25. Check for leaks at drive assembly seals; check vents; check lube level.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.