COURSE OUTLINE

AUTO 225 Manual Transmissions and Drivetrain

Prepared By: Brandon Baldwin
Revised By: BRANDON BALDWIN 2015
A. **TITLE:** Manual Transmissions and Drivetrain

B. **COURSE NUMBER:** Auto 225

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** NO

E. **COURSE LENGTH:** 15 weeks

F. **SEMESTER(S) OFFERED:** Fall

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** 2 lecture hours per week, 3 laboratory hours per week

H. **CATALOGUE DESCRIPTION:**
Topics include transmission theory, design, and operation of manually shifted front-wheel and rear-wheel drive transmissions in automotive applications. Related topics necessary to include with transmissions also include axles, drive shafts, differentials, universal joints, transfer cases, and the manual and electronic controls associated with each. Students receive equal lecture and lab sessions.

I. **PRE-REQUISITES/CO-REQUISITES:**
   a. Pre-requisite(s): AUTO 141, AUTO 144, AUTO 104
   b. Co-requisite(s): NONE

J. **GOALS (STUDENT LEARNING OUTCOMES):**

<table>
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<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
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<tr>
<td>Identify and interpret drivetrain problems to determine necessary actions.</td>
<td>2. Crit. Thinking 3. Prof. Competence.</td>
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<tr>
<td>Diagnose universal joint and constant velocity joint problems to determine necessary actions.</td>
<td>2. Crit. Thinking 3. Prof. Competence.</td>
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<tr>
<td>Diagnose four-wheel-drive and all-wheel-drive problems to determine necessary actions.</td>
<td>2. Crit. Thinking 3. Prof. Competence.</td>
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<td>Replace or repair components associated with any necessary actions.</td>
<td>2. Crit. Thinking 3. Prof. Competence.</td>
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K. **TEXTS:** Manual Drive Trains and Axles, Tom Birch, Prentice Hall.


L. **REFERENCES:**

Alldata

N. **EQUIPMENT:** Technology Enhanced Classroom, hand tools, tools specific to each transmission and differential

O. **GRADING METHOD:** A – F

P. **MEASUREMENT CRITERIA/METHODS:**

- Quizzes
- Exams
- Lab Performance
Q. **DETAILED COURSE OUTLINE**: Made Mandatory by NATEF with priority status (2013 Standards)

A. General
   1. Research applicable vehicle and service information, fluid type, vehicle service history, service precautions, and technical service bulletins. P-1
   2. Drain and refill manual transmission/transaxle and final drive unit. P-1
   3. Check fluid condition; check for leaks. P-2

B. Clutch
   1. Check and adjust clutch master cylinder fluid level. P-1
   2. Check for system leaks. P-1

C. Transmission/Transaxle
   1. Describe the operational characteristics of an electronically-controlled manual transmission/transaxle.

D. Drive Shaft, Half Shafts, Universal and Constant-Velocity (CV) Joints
   1. Inspect, remove, and replace front wheel drive (FWD) bearings, hubs, and seals. P-2
   2. Inspect, service, and replace shafts, yokes, boots, and universal/CV joints. P-2

E. Differential Case Assembly
   1. Clean and inspect differential housing; check for leaks; inspect housing vent. P-2
   2. Check and adjust differential housing fluid level. P-1
   3. Drain and refill differential housing. P-1

   E.1 Drive Axles
      1. Inspect and replace drive axle wheel studs. P-2

F. Four-wheel Drive/All-wheel Drive MD Total Tasks P-16
   1. Inspect front-wheel bearings and locking hubs. P-3 P-2 6 P-3 2
   2. Check for leaks at drive assembly seals; check vents; check lube level. P-2