

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

AUTO225 – MANUAL TRANSMISSIONS AND DRIVETRAINS

Created by: Dennis Tuper

**Canino School of Engineering Technology
Automotive Technology
Fall/2018**

A. **TITLE:** MANUAL TRANSMISSIONS AND DRIVETRAINS

B. **COURSE NUMBER:** AUTO225

C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 3

Lecture Hours: 2 per week

Lab Hours: 3 per week

Other: per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** NO

E. **GER CATEGORY:** NONE

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

G. **COURSE 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 number of lecture and lab sessions.

H. **PRE-REQUISITES/CO-REQUISITES:**

a. Pre-requisite(s): YES

Automotive Electrical Systems (AUTO 112) and (AUTO 122),
Engine Performance I (AUTO 113) and (AUTO 114), !
Engine Performance II (AUTO 213),
Automotive Braking Systems (AUTO 141) and (AUTO 144), !
Or permission of instructor. !

b. Co-requisite(s): NONE

I. **STUDENT LEARNING OUTCOMES:**

Course Student Learning Outcome (SLO)	Program Student Learning Outcome (PSLO)	ISLO	Subsets
Describe the basic operation and power flow of a manual transmission/transaxle.	ALO1, ALO2	5	
Describe the basic operation and power flow of a differential assembly.	ALO1, ALO2	5	
Successfully repair a manual transmission.	ALO1, ALO2, AL03, AL04	5	
Successfully replace a conventional Cardan universal joint assembly.	ALO1, ALO2, AL04	5	

Successfully replace a constant velocity joint assembly.	ALO1, ALO2, AL04	5	
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KEY	Institutional Student Learning Outcomes (ISLO1-5)	Automotive Learning Outcomes (ALO1-4)
ISLO #	ISLO & Subsets	
1	Communication Skills Oral [O], Written [W]	Diagnose and repair all automotive systems
2	Critical Thinking Critical Analysis [CA], inquiry & Analysis [IA], Problem Solving [PS]	Demonstrate the ability to find all related system diagnostic/repair information within auto service publications.
3	Foundational Skills Information Management [IM], Quantitative Lit/Reasoning [QTR]	Utilize the 8 point service procedures to diagnose and solve problems.
4	Social Responsibility Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]	Demonstrate safety procedures while conducting automotive service activities.
5	Industry, Professional, Discipline Specific Knowledge and Skills.	

J. % APPLIED LEARNING COMPONENT: YES

- 1] CLASSROOM/LAB
- 2] SERVICE LEARNING

K. % TEXTS:

MANUAL DRIVETRAINS and AXLES

JAMES HALDERMAN

8th EDITION

ISBN# 978-0134628363

PRENTICE HALL

2018

MANUAL TRANSMISSIONS (NATEF standards job sheets)

JACK ERJAVEC

4TH EDITION

ISBN# 978- 1111646998

DELMAR/CENGAGE

2014

L. REFERENCES:

M. EQUIPMENT:

- 1] STUDENT'S REQUIRED TOOL PACKAGE
- 2] AUTOMOTIVE PROGRAM PROVIDED SPECIAL TOOLS AS NEEDED

N. % GRADING METHOD: A-F

O. % SUGGESTED MEASUREMENT CRITERIA/METHODS:

- 1] Homework Assignments and Quizzes !
- 2] Midterm and End of Semester Exams !
- 3] Final Exam !
- 4] Participation !
- 5] NATEF Standards Job Sheets !

P. DETAILED COURSE OUTLINE:

- 1] Syllabus, general discussion / expectations, show & tell of gears and various transmission parts
- 2] Discuss overall gear ratio, show cutaway transmission, components, discuss operation
- 3] Discuss homework, gears/bearings, and related jobsheets
- 4] Discuss homework, RWD and FWD transmissions and related jobsheets
- 5] Discuss homework, show & tell of various tools, clutch parts and clutch operation
- 6] Discuss homework, differential component ID, power-flow, pre-load, and back-lash
- 7] ASE Practice questions/review and Midterm exam
- 8] Discuss homework, discuss Midterm exam, differential spreader use and gear tooth contact
- 9] Discuss homework, two-piece driveshaft service, phazing, and related jobsheets
- 10] Discuss homework, axle bearings and CV joint service / repair
- 11] Discuss homework, transfer cases, tires, and related jobsheets
- 12] Discuss homework, wiring diagrams and electronic 4WD controls
- 13] Discuss homework, discussion on AWD, 4WD, and part-time 4WD systems
- 14] ASE Practice questions/review and End of Semester exam
- 15] Final Exam

Q. LABORATORY OUTLINE: YES

- Wk. 1-4]** Manual Transmission Overhaul
- Wk. 5]** Clutches and final Transmission Tasks
- Wk. 6-7]** Differential Overhaul and Set-up
- Wk. 8]** Limited-Slip Differentials and final Differential Tasks
- Wk. 9-10]** Driveshaft, U-Joint, and C/V Joint service and related Tasks
- Wk. 11-13]** Transfer Case Overhaul and related Tasks
- Wk. 14]** Complete any unfinished Tasks and Jobsheets