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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
AUTO 241 – SUSPENSION DESIGN AND SERVICE

Created by: Jeffery Stinson

Updated by: Christopher Mayville

Canino School of Engineering Technology

Department: Automotive Technology Program

Semester/Year: Fall 2021

A. **TITLE**: Suspension Design and Service

B. **COURSE NUMBER:** AUTO 241

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

 # Credit Hours: 2
 # Lecture Hours: 2 **per week**
 # Lab Hours: **per week**
Other: **per week**

Course Length: 15 **Weeks**

D. **WRITING INTENSIVE COURSE**: Yes ☐ No ☒

E. **GER CATEGORY: None:** ☒ **Yes:** GER
***If course satisfies more than one*:** GER

F. **SEMESTER(S) OFFERED: Fall** ☒ **Spring** ☐ **Fall & Spring** ☐

G. **COURSE DESCRIPTION:**

This course covers the theory of, diagnostic and service procedures used in suspension and steering systems.

H. **PRE-REQUISITES: None** ☐ **Yes** ☒ **If yes, list below:**

AUTO 101 and AUTO 111 or MSPT 101

CO-REQUISITES: None ☐ **Yes** ☒ **If yes, list below:**

AUTO 282

I. STUDENT LEARNING OUTCOMES: (*see key below*)

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
Identify the fundamentals of wheel alignment	ALO1, ALO2	N/A	1-Comm Skills 2-Crit Think 5-Ind, Prof, Disc, Know Skills	O CA IA IM
Identify the various types of vehicle chassis and suspension systems	ALO1, ALO2, ALO3	N/A	2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA IM Subsets
Describe suspension equipment safely	ALO1, ALO2	N/A	2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Classify suspension, steering and tire problems accurately	ALO1, ALO2, ALO3	N/A	2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA PS IA Subsets
Identify special tools necessary to repair an automoive suspension or steering system	ALO1, ALO2	N/A	2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	IA PS Subsets CA
Identify steering components specific to various automotive steering system designs	ALO1, ALO2	N/A	2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets

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KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit,/Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:** Yes ☒ No ☐

If YES, select one or more of the following categories:

- ☒ Classroom/Lab
- ☐ Internship
- ☐ Clinical Placement
- ☐ Practicum
- ☐ Service Learning
- ☐ Community Service

- ☐ Civic Engagement
- ☐ Creative Works/Senior Project
- ☒ Research
- ☐ Entrepreneurship

(program, class, project)

K. TEXTS:

Halderman,J. (2014). Automotive Steering, Suspension, and Alignment

L. REFERENCES:

Manufactures Reference Manulals, Mitchell Manuals, AllData, ShopKeyPro

M. EQUIPMENT: None ☐ Needed: Technically enhanced classroom.

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Test, quizzes, homework, and classroom participation.

P. DETAILED COURSE OUTLINE:

1. Orientation
- **A. Classroom policy**
- **B. Course Overview**
- **C. Classroom expectations**

2. Wheel Bearings
- **A. Types of Wheel Bearings**
- **B. Construction - Bearing Support**
- **C. Types of Lubricants**
- **D. Seals**
- **E. Problem Diagnosis**

3. Tire and Wheels
- **A. Performance Requirements**
- **B. Tire Construction**
- **C. Tire Performance**
- **D. Tire and Wheel Sizes**
- **E. Tire and Wheel Inspection**
- **F. Vibration Diagnosis**

4. Suspension Systems
- **A. Suspension Types**
- **B. Sprung and Unsprung Weight**
- **C. Spring Requirements**
- **D. Spring Types**
- **E. Suspension Control Devices**
- **F. Shock Absorbers**

5. Suspension Control
- **A. Suspension Characteristics**
- **B. Steering Linkage Characteristics**
- **C. Ride Height and Handling**
- **D. Vehic1e Steer**
- **E. Ride Quality**

6. Steering and Wheel Alignment
- **A. Steering and Suspension**
- **B. System Geometry**
- **C. Steering Linkages**
- **D. Wheel Alignment**
- **E. Problem Diagnosis**

7. Steering Systems
- **A. Manual Steering Gear Operation**
- **B. Power Steering System Operation**
- **C. Power Steering Pumps D. Power Steering Gears**
- **E. Power Steering Diagnosis**

Q. <u>LABORATORY OUTLINE</u>: None ☒ Yes ☐