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:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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<tbody>
<tr>
<td>Identify the fundamentals of wheel alignment</td>
<td>ALO1, ALO2</td>
<td>N/A</td>
<td>1-Comm Skills 2-Crit Think 5-Ind, Prof, Disc, Know Skills O CA IA IM</td>
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<td>Identify the various types of vehicle chassis and suspension systems</td>
<td>ALO1, ALO2, ALO3</td>
<td>N/A</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO CA IA IM Subsets</td>
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<td>Describe suspension equipment safely</td>
<td>ALO1, ALO2</td>
<td>N/A</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO CA IA PS Subsets</td>
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<td>Classify suspension, steering and tire problems accurately</td>
<td>ALO1, ALO2, ALO3</td>
<td>N/A</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO CA PS IA Subsets</td>
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<tr>
<td>Identify special tools necessary to repair an automotive suspension or steering system</td>
<td>ALO1, ALO2</td>
<td>N/A</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO IA PS Subsets CA</td>
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<tr>
<td>Identify steering components specific to various automotive steering system designs</td>
<td>ALO1, ALO2</td>
<td>N/A</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO CA IA PS Subsets</td>
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<td>ISLO #</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
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<td>1</td>
<td>Communication Skills</td>
<td>Oral [O], Written [W]</td>
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<td>2</td>
<td><strong>Critical Thinking</strong></td>
<td>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
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<td>3</td>
<td><strong>Foundational Skills</strong></td>
<td>Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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<td><strong>Social Responsibility</strong></td>
<td>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</td>
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<td>5</td>
<td><strong>Industry, Professional, Discipline Specific Knowledge and Skills</strong></td>
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*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. Vehicle 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. LABORATORY OUTLINE: None ☒ Yes ☐