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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
ENGS 350 – MECHANICS OF MACHINE ELEMENTS

Created by: Dr. Lucas Craig
Updated by: Dr. Lucas Craig

Canino School of Engineering Technology
Department: MKTX
Semester/Year: Fall 2022
A. **TITLE:** Mechanics of Machine Elements

B. **COURSE NUMBER:** ENGS 350

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

- # Credit Hours: 4
- # Lecture Hours: 2 hr 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:**

Students in this course develop fundamentals of mechanics of machine design. Students apply their knowledge of statics, strengths, and materials to the designing of machine components.

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

ENGS 203

**CO-REQUISITES:** None ☒ Yes ☐ If yes, list below:
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>
</tr>
</thead>
<tbody>
<tr>
<td>Perform static load analysis on machine elements.</td>
<td></td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
</tr>
<tr>
<td>Select appropriate material for a mechanical machine element.</td>
<td></td>
<td>2-Crit Think 3-Found Skills ISLO</td>
<td>PS Subsets Subsets Subsets</td>
</tr>
<tr>
<td>Apply statics and strengths to determine stress on shafts, screws, bearings, gears, and other machine elements.</td>
<td></td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
</tr>
<tr>
<td>Apply a variety of failure theories to a design analysis.</td>
<td></td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
</tr>
<tr>
<td>Design a mechanical drive system using belts, chains drives, or gears.</td>
<td></td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
</tr>
<tr>
<td>Apply Mohr’s circle for combined stresses.</td>
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<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
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<tr>
<td>ISLO</td>
<td>ISLO</td>
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<td>KEY</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
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<tr>
<td>ISLO #</td>
<td>ISLO &amp; Subsets</td>
<td></td>
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</tr>
</tbody>
</table>
| 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:**


L. **REFERENCES:**

N/A

M. **EQUIPMENT:** None ☒ Needed:

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>25%</td>
</tr>
<tr>
<td>Exams (3)</td>
<td>60%</td>
</tr>
<tr>
<td>Final Exam / Project</td>
<td>15%</td>
</tr>
</tbody>
</table>

P. **DETAILED COURSE OUTLINE:**

I. Introduction to Basic Design
   a) Materials
   b) Load and Stress Analysis
   c) Deflection and Stiffness

II. Failure Prevention
   a) Static Loading
   b) Variable Loading

III. Design of Mechanical Elements
   a) Shafts
   b) Screws, Fasteners
   c) Welding, Bonding
   d) Springs
   e) Bearings
   f) Gears
   g) Clutches, Brakes, Couplings, Flywheels
   h) Belts and Chains
   i) Keys
   k) Selection of Seals

Q. **LABORATORY OUTLINE:** None ☒ Yes ☐