

**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:

<b><u>Course Student Learning Outcome</u></b> <b><u>[SLO]</u></b>	<b><u>Program Student Learning Outcome</u></b> <b><u>[PSLO]</u></b>	<b><u>GER</u></b> <i>[If Applicable]</i>	<b><u>ISLO &amp; SUBSETS</u></b>	
Perform static load analysis on machine elements.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Select appropriate material for a mechanical machine element.			2-Crit Think 3-Found Skills ISLO	PS Subsets Subsets Subsets
Apply statics and strengths to determine stress on shafts, screws, bearings, gears, and other machine elements.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Apply a variety of failure theories to a design analysis.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Design a mechanical drive system using belts, chains drives, or gears.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Apply Mohr's circle for combined stresses.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets

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

\*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:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement              |
| <input type="checkbox"/> Internship               | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement       | <input type="checkbox"/> Research                      |
| <input type="checkbox"/> Practicum                | <input type="checkbox"/> Entrepreneurship              |
| <input type="checkbox"/> Service Learning         | (program, class, project)                              |
| <input type="checkbox"/> Community Service        |  |

K. **TEXTS:**

Robert L Mott, Edward M. Vavrek and Jyhwen Wang Machine Elements in Mechanical Design, 6<sup>th</sup> ed., Pearson.

L. **REFERENCES:**

N/A

M. **EQUIPMENT:** None  Needed:

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

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

Homework	25%
Exams (3)	60%
Final Exam / Project	15%

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