

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



**MASTER SYLLABUS**

**COURSE NUMBER – COURSE NAME  
ENGS 302 – ENGINEERING DYNAMICS II**

**Created by: Dr. Lucas Craig**

**Updated by: Dr. Lucas Craig**

**Canino School of Engineering Technology**

**Department: MKTX**

**Semester/Year: Fall 2021**

- A. **TITLE:** Engineering Dynamics II
- B. **COURSE NUMBER:** ENGS 302
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

# Credit Hours: 3  
# Lecture Hours: 3 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:**

In this second dynamics course, students learn about planar two-dimensional rigid body kinematics, kinetics of rigid bodies—force and acceleration, work and energy, and impulse, momentum, and three-dimensional motion. An introduction to vibrations is also provided.

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

ENGS 202 or MECH 301

**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:

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO &amp; SUBSETS</u>	
Solve two-dimensional kinematic motion of rigid bodies.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Solve force and acceleration for two-dimensional rigid bodies.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Solve kinetic and potential energy problems through conservation of energy for two-dimensional rigid bodies.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Solve impulse and momentum for two-dimensional rigid bodies.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Analyze kinematics and kinetics for three-dimensional rigid bodies.			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets

			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
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KEY	<u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u>
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:**

Hibbeler, R. Engineering Mechanics: Dynamics (14th edition). New York: Prentice Hall, 2016.

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. Planar Kinematics of Rigid Bodies**

**A. Planar rigid body motion**

**II. Planar Kinetics of Rigid Bodies: Force, Mass, and Acceleration**

**A. Mass Moment of Inertia**

**B. Kinetic Equations of Motion: Translation, Rotation about a Fixed Axis,  
General Planar Motion**

**III. Planar Kinetics of Rigid Bodies: Work and Energy**

**A. Kinetic Energy**

**B. Principle of Work and Energy**

**C. Conservation of Energy**

**IV. Three-Dimensional Kinematics and Kinetics of Rigid Bodies**

**A. Rotation about a Fixed Point**

**B. Angular Momentum**

**C. Kinetic Energy**

**V. Introduction to Vibrations**

**A. Undamped Natural Frequency**

**B. Energy Methods**

**Q. LABORATORY OUTLINE: None  Yes**