

**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:

Canino School of Engineering Technology !

Department: MKTX !

Semester/Year: Spring 2019 !

- 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

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 & 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	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
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:

- | | |
|---|--|
| <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