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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
ENGM 101 – Introductory Mathematics for Engineering Applications

Created by: Michael J. Newtown, P.E.

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Canino School of Engineering Technology !

Department: Mechatronics Engineering Technology !

Semester/Year: Fall 2018 !

A. **TITLE**: Introductory Mathematics for Engineering Applications

B. **COURSE NUMBER:** ENGM 101

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:**

This course provides an overview of the salient math topics most heavily used in the core engineering and engineering technology courses. These include algebraic manipulation of equations, trigonometry, vectors and complex numbers, and systems of equations. All topics are presented within the context of engineering application, and reinforced through extensive examples of their use in the core engineering or technology courses.

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

MATH 106 or permission of the instructor

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:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
Apply mathematic concepts to engineering solutions	a, e		2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets
Utilize algebra to solve linear functions in engineering projects	a		2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets
Solve trigonometric functions found commonly in engineering applications	a, b, d		2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets
Solve systems of equations for various engineering applications	a, e		2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets
Apply the concepts of statistics to common engineering problems	a, b		2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets
Apply the fundamentals if derivatives and limits to kinematic sytems and in the application of Newton's laws of motion.	a, e		2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets
Apply the concepts of integration to engineering systems	a		2-Crit Think ISLO ISLO	Subsets Subsets Subsets Subsets

KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
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**

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:

Stroud, K.A. Booth, D. "Engineering Mathematics", 7th edition, Industrial Press Inc., 2013

L. REFERENCES:

Gilat, Amos, MATLAB: An Introduction with Applications, 5th edition, New Jersey: John Wiley & Sons, Inc., 2014
Rattan, Kuldip S., Nathan Klingbel, Introductory Mathematics for Engineering Applications. New Jersey: John Wiley & Sons, Inc., 2015

M. EQUIPMENT: None ☐ **Needed:** Technology enhanced classroom for lecture, and computer lab for laboratory

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

- **Exams**
- **Homework**
- **Laboratory**
- **Participation**

P. DETAILED COURSE OUTLINE:

I. Systems of Equations and Simultaneous Solutions
II. Polynomial Equations
III. Partial Fraction Decompostion
IV. Trigonometry
V. Factorials, Combinatorials, Sigma, e
VI. Engineering Statistics
VII. Differentiation
VIII. Integration

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

I. Ohms Law, Mesh Current, Node Voltage

II. Projectile Motion and Kinematic Equations
III. Trigonometry
IV. Engineering Statistics
VI. Newton's Laws of Motion Explored
VII. Power and Energy Methods