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

MASTER SYLLABUS

ENGS 101 – INTRODUCTION TO ENGINEERING

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Canino School of Engineering Technology

Department: ENGINEERING SCIENCE

Semester/Year: FALL 2022

A. **TITLE**: INTRODUCTION TO ENGINEERING

B. **COURSE NUMBER:** ENGS 101

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

 # Credit Hours: 2
 # Lecture Hours: **per week**
 # Lab Hours: (2) two-hour **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 introduces students to the various engineering disciplines, professional organizations and ethical aspects of professional expectations. Engineering analysis introduces problem solving, engineering computations, manual sketching, and work presentation. Hands-on challenges engage the student in the design process, team work and critical thinking. Local expectation regarding written communication and oral presentations are presented and reinforced through projects.

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

CO-REQUISITES: None ☐ **Yes** ☒ **If yes, list below:**

Pre-Calculus Algebra (MATH 123) or College Algebra (MATH 121) or higher, or permission of instructor.

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***	
A. Demonstrate familiarity with the engineering profession and the professional responsibilities and expectations of engineering practitioners	PENDING ABET OUTCOME UPDATE		3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
B. Demonstrate acquisition of the common attributes that lead to success in college and in an engineering career			3-Found Skills 4-Soc Responsibility ISLO	IM Subsets Subsets Subsets
C. Demonstrate the ability to operate the computer applications considered essential in the pursuit of engineering study			1-Comm Skills 5-Ind, Prof, Disc, Know Skills ISLO	W Subsets Subsets Subsets
D. Demonstrate the ability to interpret technical drawings and prepare hand drawn sketches that effectively communicate technical information			1-Comm Skills 5-Ind, Prof, Disc, Know Skills ISLO	W Subsets Subsets Subsets
E. Effectively present ideas and concepts to other engineers in an oral and written manner			1-Comm Skills 1-Comm Skills ISLO	O W Subsets Subsets
F. Work effectively in a team environment			4-Soc Responsibility ISLO ISLO	T Subsets Subsets Subsets

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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**

*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:

Stephan, E. A., Bowman, D. R., Park, W. J., Sill, B. L., & Ohland, M. W. (2018). Thinking like an engineer: an active learning approach (3rd ed.). NY NY: Pearson.

L. REFERENCES:

CSOET Communication Manual, A. Rygel 2014

M. EQUIPMENT: None ☒ Needed:

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Exams, Homework, Projects, Quizzes

The following skills must be demonstrated in order to pass the class:

1. **Ability to convert units accurately and in the format prescribed.**
2. **Presentation of solved problems in the prescribed format.**
3. **Demonstration of a high level of "academic discipline" as demonstrated by strict adherence to attendance policy and timely submittal of assignments in the prescribed format.**
4. **Prepare xy graphs (scatter plots) by hand and in excel (or MatLab) in accordance with prescribed format.**
5. **Preparation of a least one moderately sophisticated report prepared in the prescribed format.**
6. **Demonstration of an appropriate application of engineering ethics with student peers (public safety, respect of others, a respect for diversity, application of professional and personal ethics).**
7. **Ability and willingness to work cooperatively with a team and contribute effectively toward a group assignment.**

P. DETAILED COURSE OUTLINE:

(Presentation is not restricted to the order presented here.)

I. History of Engineering

i. Ancient history
ii. A hundred years ago
iii. Engineering today
II. Explore various engineering disciplines
i. Aeronautical and Aerospace, Mechanical, Electrical and electronics, Civil, Environmental, Chemical
III. The Engineering Profession
i. Path to licensure
ii. PE responsibilities
iii. Ethical considerations and consequences
IV. Introduction to graphic communication
i. Reading Engineering diagrams and plans
ii. Graphic design process
iii. Alphabet of lines
iv. Standards and conventions
v. Tools
vi. Sketching
vii. Lettering
viii. Orthographic drawings and sketching
ix. Isometric drawing and sketching
V. Engineering Design
i. Traditional engineering
ii. Concurrent engineering
iii. Prototyping
iv. Steps in design
1. Problem statement
2. Analyze the problem
3. Concept Development
4. Alternatives
5. Configuration of Design
6. Final design and documentation
VI. Engineering analysis and problem solving
i. Problem-solving approaches
ii. Presentation of work (IAW communication manual)
iii. Unit conversions
iv. Dimensional Analysis
v. Preparation of graphs
vi. Use of software applications in problem-solving and analysis
1. Excel (All students expected to be able to use excel)
2. MatLab
VII. Communication
i. Guidelines for effective writing
ii. Design notebook
1. Written Reports
a. Lab reports
b. Letter reports
c. Design Reports
2. Oral Reports
3. Use of "powerpoint"

Q. <u>LABORATORY OUTLINE</u>: None ☒ Yes ☐