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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MATH 162 - CALCULUS II

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Canino School of Engineering Technology

Department: MATHEMATICS DEPARTMENT

Semester/Year: Fall/2018

A. **TITLE**: CALCULUS II

B. **COURSE NUMBER:** MATH 162

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

 # Credit Hours: 4
 # Lecture Hours: 4 **per week**
 # Lab Hours: 0 **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 is the second of a three-semester sequence in Calculus. Topics include: differentials, definite integrals and their applications; integration of exponential, logarithmic, trigonometric and inverse trigonometric functions; techniques of integration; series; parametric equations and polar coordinates. Four hours of lecture per week.

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

Calculus I (MATH 161) with a grade of C or better or permission of 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 results from Calculus I to differentiate and integrate functions and relations and use the integration technique of u-substitution		GER 1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Use the definite integral to compute area, volume, arc length, and work done by a variable force		GER 1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Solve problems involving exponential and logarithm functions and compute derivatives and integrals of these functions		GER 1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Use substitution, integration by parts, trigonometric substitutions, and partial fractions to compute integrals		GER 1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Use L'Hopitals rule to compute limits of indeterminate forms at infinity and zero, and find the limit of a sequence		GER 1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Produce Taylor series and Maclauren series for a variety of common functions		GER 1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets 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:

Calculus, the Classic Edition, 5th Edition; by Swokowski; Brooks/Cole Cengage Learning

L. REFERENCES:

Many materials in the Math Lab and online will aid the students with mastery of this subject

M. EQUIPMENT: None ☒ Needed:

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

- **Homework**
- **Quizzes**
- **Exams**
- **Projects**

P. DETAILED COURSE OUTLINE:

I. Applications of Integration
A. Area between two curves
B. Volumes of Revolution
1. Disk Method
2. Washer Method
3. Shell Method
C. The length of an Arc
D. Surface Area (Optional)
E. Work (Liquid Pressure and Moments Optional)

II. Transcendental Functions
A. Techniques for Integration of Products Powers of Trigonometric Functions
B. Differentiation and Integration of Logarithmic and Exponential Functions
C. Logarithmic Differentiation
D. Differentiation and Integration of Inverse Trigonometric Functions

III. Integration Techniques, L'Hopital's Rule, and Improper Integrals
A. Integration by Substitution
B. Integration by Parts
C. Trigonometric Integrals
D. Trigonometric Substitution
E. Partial Fractions
F. Limits of Indeterminate Form and L'Hopital's Rule
G. Improper Integrals

IV. Infinite Series
A. Sequences, monotonic sequences and bounded sequences
B. Geometric Series
C. Tests for Convergence and Divergence for Series of Constant terms (optional)
D. Power series
E. Taylor series and Maclaurin series of common functions

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