SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES
Mathematics
Revision Date: 07-01-22
Syllabus Statements

I. CATALOG DESCRIPTION

Course Number:	MATH1700
Course Title:	Calculus & Analytic Geometry II
Prerequisite:	A grade of "C" or higher in MATH1600 or equivalent.
Catalog Description:	Continuation of MATH1600. Study of antiderivatives, methods of integration; numerical methods, coordinates and conics, differential equations, Taylor series and an introduction to differentiation and integration of vector valued functions. A graphing calculator or use of mathematical software may be required.
Credit Hours:	5.0
Class Hours:	75
Lab Hours:	0
Total Contact Hours:	75

II. COURSE OBJECTIVES: *Course will:*

A. Explore integrable function and improper integrals.
B. Explore infinite sequences and series.
C. Explore power series including Taylor and Maclaurin Series.
D. Investigate alternate ways of defining curves in space including parametric equations and polar coordinates.
E. Introduce the algebra of vectors and applications of vectors in two and three dimensions.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. Student Learning Outcomes**:** *Student will be able to:*

1. The student will use various techniques, including integration by parts, trigonometric substitutions, partial fractions, etc., to evaluate certain integrable functions and compute certain definite integrals.
2. The student will be able to apply numerical techniques including the trapezoidal and Simpson's rules to approximate definite integrals.
3. The student will apply techniques to determine the convergence or divergence of certain improper integrals.
4. The student will be able to apply convergence tests, including comparison and ratio tests to determine if certain infinite series converge, converge absolutely or conditionally.
5. The student will be able to determine the interval of convergence of power series.
6. The student will be able to approximate certain differentiable functions with Taylor or Maclaurin series.
7. The student will be able to write parametric and polar forms of equations to define curves in the plane.
8. The student will be able to perform algebraic operations including the dot and cross product, on vectors.
9. The student will be able to use scalars and vectors to write equations for lines, line segments, and planes in space.

B. General Education Learning Outcomes

1. GELO #3: Critical Thinking & Problem Solving
Outcome: Collect, identify, interpret and analyze data.
Outcome: Synthesize information to arrive at reasoned solutions to problems.
Outcome: Evaluate the validity of arguments, alternatives, data, outcomes, and/or impacts of actions.

Outcome: Acquire and integrate knowledge and construct relationships across disciplines.

2. GELO #5: Analytical, Quantitative, and Scientific Reasoning

Outcome: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.

Outcome: Understand and create logical arguments supported by quantitative and scientific evidence and communicate those arguments in a variety of formats.

Outcome: Effectively develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.

Outcome: Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

A. Work
B. Moments and Center of Mass
C. Separable Differential Equations
D. Integration by Parts
E. Trigonometric Integrals
F. Trigonometric Substitution
G. Partial Fraction Decomposition
H. Numerical Integration
I. Improper Integrals
J. Sequences
K. Infinite Series
L. Integral Test
M. Comparison Tests
N. The Ratio and Root Tests
O. Alternating Series/Absolute Convergence
P. Power Series
Q. Taylor and Maclaurin Series
R. Convergence of Taylor Series
S. Parametric Equations
T. Polar Coordinates
U. Graphing in Polar Coordinates
V. Area and Arc Length in Polar Coordinates
W. Three-Dimensional Coordinate Systems
X. Vectors
Y. The Dot Product (Scalar product)
Z. The Cross Product (Vector product)
AA. Lines and Planes in Space
BB. Vector Valued Functions and Their Derivatives
CC. Integrals of Vector Functions
DD. Arc Length of Curves in Space

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):

1. Hass, *University Calculus, Early Transcendentals*, 4th Edition, Pearson, 2020. With Inclusive Access.

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. Lecture

2. Small group discussions
3. In class activities
4. Projects
5. MyMathLab assignments and supplements
6. A graphing calculator is required.
7. Topics are discussed algebraically, graphically and numerically. A graphing calculator is used for graphical and numerical points of view.

VII. METHODS OF EVALUATION

A. Methods of evaluation typically include a combination of the following:

1. Quizzes
2. Homework\MyMathLab
3. Hour exams
4. Projects
5. Class attendance
6. Comprehensive final exam

B. SCC GRADING SCALE:

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		

VIII. SPECIFIC COURSE REQUIREMENTS

A. Students need to have completed the equivalent of MATH1600 (Calculus with Analytic Geometry I) with a grade of "C" or better.