SUNY SCHENECTADY
Course Outline

ACADEMIC DIVISION/SCHOOL: Math, Science, Technology, and Health

PREPARED BY: Cayla Gaworecki, Laurie Lacey, Ray Ross, Daniel Holz

COURSE CODE: MAT 167   **COURSE TITLE:** Precalculus with Analytic Geometry

LECTURE HOURS/WEEK: 4   **LAB HOURS/WEEK:**   0   **CREDIT HOURS:**   4

PREREQUISITE(S):   MAT 154 or per Math Advising Flow Chart

PREREQUISITE or CONCURRENT COURSE:

COREQUISITE:

COURSE DESCRIPTION:

This course provides an overview of polynomial, rational, exponential, logarithmic, and trigonometric functions as a prelude to Calculus. Function features such as domain and range, zeros, continuity, and end behavior are determined both algebraically and graphically. The course also explores function concepts of combination, composition, and inverses. Additional topics include the Law of Sines, the Law of Cosines, polar coordinates, conic sections, and introduction to limits.

SUNY GENERAL EDUCATION:		
Courses with this distinction must align with the SUNY-defined SLOs found at **https://system.suny.edu/academic-affairs/acaproplan/general-education/suny-ge/.**		
KNOWLEDGE AND SKILLS AREA		
CATEGORY 1	Mathematics & Quantitative Reasoning	
CATEGORY 2		
CATEGORY 3		
CATEGORY 4		
CORE COMPETENCY		

CATEGORY 1	
CATEGORY 2	

STUDENT LEARNING OUTCOMES:

Students who have successfully completed this course will have:

- identified and analyzed polynomial, rational, exponential, logarithmic, and trigonometric functions given an equation and/or graph;
- determined asymptotes and end behavior of rational, logarithmic, exponential, and trigonometric function equations and/or graphs, linking these features to the concept of limits;
- utilized the Fundamental Theorem of Algebra to determine the number of zeros and employed techniques such as factoring to find real zeros;
- used trigonometric identities and algebra to simplify trigonometric expressions and solve trigonometric equations; and
- identified conics given an equation in standard and/or general form and converted from one equation form to the other.

REPRESENTATIVE TEXT(S):

TITLE	AUTHOR(S)	PUBLISHER
Precalculus (current edition)	Jay Abramson	OpenStax
SPECIAL NOTES:	Lumen OHM or a similar online homework program is recommended	

COURSE MATERIALS:

TI-83 or TI-84 Graphing Calculator (may be available to be borrowed from the college or may be downloadable for a low cost)

NOTE: Grading and assessment criteria may appropriately differ. Grades focus on what individual students have learned while assessments focus on entire cohorts of students. Each instructor will determine his/her grading criteria for the course and state on the course syllabus.

EVALUATION METHODS:

Required are assignments or examinations. Other methods may include, but are not limited to, quizzes and projects.

Assessment results from these methods will be used for course-level assessment and, where applicable, for SUNY General Education Knowledge and Skills Areas and Core Competencies. This information will be incorporated into program reviews.

STUDENT LEARNING OUTCOME	METHOD(S)
Identified and analyzed polynomial, rational, exponential, logarithmic, and trigonometric functions given an equation and/or graph	Assignments or Examinations
Determined asymptotes and end behavior of rational, logarithmic, exponential, and trigonometric function equations and/or graphs, linking these features to the concept of limits	Assignments or Examinations
Utilized the Fundamental Theorem of Algebra to determine the number of zeros and employed techniques such as factoring to find real zeros	Assignments or Examinations
Used trigonometric identities and algebra to simplify trigonometric expressions and solve trigonometric equations	Assignments or Examinations
Identified conics given an equation in standard and/or general form and converted from one equation form to the other	Assignments or Examinations

COURSE CONTENT OUTLINE:

NOTE: **College policy requires a final exam or final week activity.**

WEEK(S)/HOUR(S)	TOPIC
1-2	Functions: Notation, Domain/Range, Difference Quotient, Combinations, Composition, Inverses
3-5	Polynomial and Rational Functions: Asymptotes, End Behavior, Fundamental Theorem of Algebra
6-7	Exponential and Logarithmic Functions
8-9	Trigonometric Functions: Graphs, Identities, Sum and Difference Formulas, Double-Angle Formulas, Equations
10-11	Applications of Trigonometry: Laws of Sines and Cosines, Polar Coordinates, Graphs of Polar Equations
12	Systems of Equations: Linear, Non-Linear, Matrices
13	Conic Sections: Circle, Ellipse, Parabola, Hyperbola
14-15	Introduction to Limits: Basic Evaluation Techniques
16	Final Examination