SCHENECTADY COUNTY COMMUNITY COLLEGE
Course Outline

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

PREPARED BY: Laurie Lacey, Margaret Spring, and Ray Ross

COURSE CODE: MAT 181 **COURSE TITLE:** Calculus II

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

PREREQUISITE/S: MAT 180, Calculus 1, or equivalent
PREREQUISITE or CONCURRENT COURSE: none
COREQUISITES: none

FINAL EXAM REQIDRED: yes

COURSE DESCRIPTION:
This course, in the calculus of a single variable, includes problems involving the calculus of inverse trigonometric functions; integration techniques; applications of integration; L'Hopital's Rule; improper integrals; infinite sequences and series; parametric equations and plane curves; polar coordinates and polar curves.

SCCC Core Principle Course **yes**
SUNY General Education Course **yes**

STUDENT LEARNING OUTCOMES:

Students who have successfully completed this course will:

- select and evaluate the appropriate method for determining volumes of solids of revolution;
- set up integrals that will yield arc length of rectangular curves, plane curves, and polar curves and evaluate integrals that will yield arc length of these curves.
- interpret word problems that involve setting up integrals and apply the appropriate techniques of integration to evaluate area and volume;
- given a series, determine and apply an appropriate test to decide upon the convergence or divergence of the series;
- apply the power series theorem to determine the interval of convergence of power series, and
- determine and evaluate the derivative of parameterized curves and polar curves.

REPRESENTATIVE TEXT/S:
Larson and Edwards, *Calculus: Early Transcendental Functions,* Cengage, Current Edition, (Print)

SUPPLEMENTARY MATERIALS: (Optional)
Computer software and/or graphing calculators will be used.

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
Evaluation methods are to include at least two semester exams and a final examination and at least one graded homework or project. Other methods of evaluation may include, but are not limited to, additional graded homework or written projects, computer projects, calculator projects and quizzes.

REQUIRED ASSESSMENT METHODS:
Assessment results from these methods will be used for course-level assessment and, where applicable, for SCCC core principles and SUNY General Education Knowledge and Skills areas. This information will be incorporated in program reviews.

Student Leaming Outcome	Method(s)
Select and evaluate the appropriate method for determining volumes of solids of revolution	Questions on examinations.
Set up integrals that will yield arc length of rectangular curves, plane curves, and polar curves and evaluate integrals that will yield arc length of these curves	Questions on examinations.
Interpret word problems that involve setting up integrals and apply the appropriate techniques of integration to evaluate area and volume	Questions on examinations.
Given a series, determine and apply an appropriate test to decide upon the convergence or divergence of the series	Questions on examinations.
Apply the power series theorem to determine the interval of convergence of power series	Questions on examinations.
Determine and evaluate the. derivative of parameterized curves and polar curves	Questions on examinations.

COURSE CONTENT OUTLINE:

The course Content Outline is attached.

COURSE CONTENT OUTLINE:

Note: Some instructors may choose cover plane curves before series and sequences.

Course: MAT 181- Calculus II

Week(s)	**Topics**
1-3	Applications of Integration: area between two curves; volumes of solids of revolution using the disc and shell methods; arc length; work
4-8	Integration Techniques: review of basic integration techniques including u-substitution; integration of exponential and logarithmic functions; differentiation and integration of inverse trig functions; integration by parts; partial fraction decomposition; trigonometric integrals and substitution; indeterminate forms; L'Hopital's Rule; improper integrals; numerical integration
9-12	Infinite Series and Sequences: sequences; convergence; divergence; of limits sequences and bounded sequences; infinite series; geometric, telescoping, and p-series, properties of convergent series; tests of convergence; integral test; comparison test; absolute and conditional convergence; power series; radius of convergence; representations of functions by power series; Taylor and Maclaurin series
13-15	Plane Curves, Parametric Equations, and Polar Coordinates: plane curves; parametric equations; the calculus of parametric equations; polar coordinates and polar graphs; area and arc length of plane and polar curves.
Final Week	Final Examination