

MATH-1520 CALCULUS II 3 CREDITS

SYLLABUS

CATALOG DESCRIPTION

Continues course of study begun in Calculus I. Covers integration techniques, numerical integration, improper integrals, some differential equations, sequences, series and applications.

Prerequisites: High School Calculus course grade of C or better and GPA of 3.4 or higher.

Semester Offered: Fall, Spring

COMMON STUDENT LEARNING OUTCOMES

Upon successful completion of San Juan College programs and degrees, the student will demonstrate competency in...

BROAD AND SPECIALIZED LEARNING

Students will actively and independently acquire, apply, and adapt skills and knowledge with an awareness of global contexts.

CRITICAL THINKING

Students will think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.

CULTURAL AND CIVIC ENGAGEMENT

Students will act purposefully, reflectively, and ethically in diverse and complex environments.

EFFECTIVE COMMUNICATION

Students will exchange ideas and information with clarity in multiple contexts.

INFORMATION LITERACY

Students will be able to recognize when information is needed and have the ability to locate, evaluate, and use it effectively.

INTEGRATING TECHNOLOGIES

Students will demonstrate fluency in the application and use of technologies in multiple contexts.

Student work from this class may be randomly selected and used anonymously for assessment of course, program, and/or institutional learning outcomes. For more information, please refer to the Dean of the appropriate School.

COURSE LEARNING OUTCOMES

Upon successful completion of the course, the student will be able to...

1. Integration

- a. Determine the indefinite integrals and compute definite integrals of algebraic and transcendental functions using various techniques of integration including integration by parts, trigonometric substitution, and partial fraction decomposition.

- b. Compute improper integrals using the appropriate limit definitions.
 - c. Solve problems involving separable differential equations.
2. Sequences and Series
- a. Compute the limit of sequences.
 - b. Compute the sum of a basic series using its n th partial sum.
 - c. Compute the sum of geometric and telescoping series.
 - d. Determine if a series converges using the appropriate test, such as the n th term, integral, p -series, comparison, limit comparison, ratio, root, and alternating series tests.
 - e. Determine if a series converges absolutely, converges conditionally or diverges.
3. Properties of power series
- a. Compute the radius and interval of convergence of a power series.
 - b. Compute the Taylor polynomials of functions.
 - c. Compute basic Taylor series using the definition.
 - d. Compute Taylor series using function arithmetic, composition, differentiation, and integration.
 - e. Compute limits with Taylor series.
 - f. Approximate definite integrals with Taylor series and estimate the error of approximation.
 - g. Determine the sum of a convergent series using Taylor series.
4. Applications of integration
- a. Compute volumes and areas of surfaces of solids of revolution.
 - b. Compute length of curves.
 - c. Apply integration using alternative coordinate forms and using a parameter.