- Course Number and Title:

  MATH 1521G. Calculus and Analytic Geometry II

- Catalog Description:

  Riemann sums, the definite integral, antiderivatives, fundamental theorems, techniques of integration, applications of integrals, improper integrals, Taylor polynomials, sequences and series, power series and Taylor series.

- Credit Hours:

  4 Credits (4)

- Prerequisite(s) / Corequisite(s)

  Prerequisite(s): MATH 1511G
  Corequisite(s): None

- Required:

  Required for BSME and BSAE Degrees

- Course Availability:

  Fall and Spring Semesters + Summer

- Instructor (Usual):

  Various

- Textbook:

  Steward, J., Clegg, D., and Watson, S., *Calculus, Early Transcendentals,* 9th Ed., 2020, Cengage Learning (**ISBN-10:** 1337613924 or **ISBN-13:** 978-1337613927)

- Course Learning Objectives:

  <u>After completing this course, a student should be able to:</u>
  1) Recognize the interplay between Riemann sums and definite integrals.
  2) Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals.
  3) Demonstrate an understanding of the relationship between the derivative and the definite integral.
  4) Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's).
  5) Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions).
  6) Use integration to solve problems in geometry, physics, science, engineering and other fields.
  7) Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals.
  8) Approximate functions using Taylor polynomials.
  9) Apply standard tests to determine convergence or divergence of sequences and series.
  10) Find a power series representation for a function and determine where it converges.
  11) Identify and evaluate first order differential equations.

- Topics Covered:

  The definite integral, the fundamental Theorem of calculus, techniques of integration, applications of integration, sequences of real numbers, series of real numbers, criteria of convergence of series, power series, Taylor series