Department of Teaching & Learning
Parent/Student Course Information

DUAL ENROLLMENT CALCULUS WITH
ANALYTIC GEOMETRY II
(TC3270)
TIDEWATER COMMUNITY COLLEGE
(MTH 174)
One-half credit, One semester

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION
Calculus with Analytic Geometry II is a dual-enrollment, one-semester course providing the successful student with four college semester credits and one-half Virginia Beach City Public Schools (VBCPS) elective credit. This course continues the study of analytic geometry and the calculus of algebraic and transcendental functions including rectangular, polar and parametric graphing, indefinite and definite integrals, methods of integration and power series along with their applications. It is designed for mathematical, physical and engineering science programs.
*Tuition, fees and textbook fees are the responsibility of the student in accordance with the dual enrollment regulation (5-30.2).

PREREQUISITE
Students who have successfully completed Advanced Placement (AP) Calculus AB with a minimum score of four on the corresponding AP exam.

Objectives for MTH 174: Calculus with Analytic Geometry II

Unit 1: Integration Techniques, L'Hôpital's Rule and Improper Integrals
  a. The student will be able to construct antiderivatives using the Fundamental Theorem of Calculus.
  b. The student will be able to find antiderivatives using substitution.
  c. The student will be able to find antiderivatives using integration by parts.
  d. The student will be able to find antiderivatives of trigonometric integrals.
  e. The student will be able to find antiderivatives using trigonometric substitution.
  f. The student will be able to find antiderivatives using partial fractions.
  g. The student will be able to use integration tables to find antiderivatives when appropriate.
  h. The student will be able to evaluate indeterminate forms using L'Hôpital's Rule.
  i. The student will determine when improper integrals converge and compute values where possible.

Unit 2: Infinite Series
  a. The student will determine when a sequence converges.
  b. The student will review basic geometric series and sequences.
  c. The student will study the following tests for series convergence (divergence):
      1. The Integral and p-Series Tests
      2. The Series Comparison Test
      3. The Alternating Series Test
      4. The Ratio Test
      5. The nth Root Test
      6. The Limit Comparison Test
  d. The student will be able to construct Power Series.
  e. The student will be able to represent functions with series.
  f. The student will be able to construct Taylor Polynomials.
  g. The student will be able to construct Taylor (MacClaurin) Series.
  h. The student will be able to find both the interval and radius of convergence for Taylor and MacClaurin Series.

Unit 3: Conics, Parametric Equations, Polar Coordinates
  a. The student will review conic sections.
  b. The student will be able to represent plane curves with parametric equations.
  c. The students will be able to apply Calculus to parametric equations and compute the following:
      1. Derivatives
      2. Antiderivatives
      3. Arc Length
      4. Surface Area
  d. The student will review polar coordinates and polar graphs.
  e. The student will be able to apply Calculus to polar equations and compute the following:
      1. Derivatives
      2. Antiderivatives
      3. Arc Length
      4. Surface Area

Unit 4: Vectors and the Geometry of Space
  a. The student will review representation of vectors in a plane.
  b. The student will be able to compute coordinates and manipulate vectors in space.
  c. The student will be able to compute the dot product of two vectors.
  d. The student will be able to compute the cross product of two vectors in space.

Aaron C. Spence, Ed.D., Superintendent
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Produced by the Department of Teaching and Learning.
For further information, please call (757) 263-1070.

Notice of Non-Discrimination Policy
Virginia Beach City Public Schools does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation/gender identity, pregnancy, childbirth or related medical condition, disability, marital status, age, genetic information or veteran status in its programs, activities, employment, or enrollment, and provides equal access to the Boy Scouts and other designated youth groups. School Board policies and regulations (including, but not limited to, Policies 2-33, 4-4, 5-7, 5-19, 5-20, 5-44, 6-33, 6-7, 7-48, 7-49, 7-57 and Regulations 4-4.1, 4-4.2, 5-44.1, 7-11.1, 7-17.1 and 7-57.1) provide equal access to courses, programs, enrollment, counseling services, physical education and athletic, vocational education, instructional materials, extracurricular activities and employment.

Title IX Notice: Complaints or concerns regarding discrimination on the basis of sex or sexual harassment should be addressed to the Title IX Coordinator, at the VBCPS Office of Student Leadership, 641 Carriage Hill Road, Suite 200, Virginia Beach, 23452, (757) 263-2020, Mary.Dees@vbschools.com (student complaints) or the VBCPS Department of School Leadership, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (757) 263-1088, Elizabeth.Bryant@vbschools.com (employee complaints). Additional information regarding Virginia Beach City Public Schools' policies regarding discrimination on the basis of sex and sexual harassment, as well as the procedures for filing a formal complaint and related grievance processes, can be found in School Board Policy 5-44 and School Board Regulations 5-44.1 (students), School Board Policy 4-4 and School Board Regulation 4-4.3 (employees), and on the School Division's website at Diversity, Equity and Inclusion/Title IX. Concerns about the application of Section 504 of the Rehabilitation Act should be addressed to the Section 504 Coordinator/Executive Director of Student Support Services at (757) 263-1980, 2512 George Mason Drive, Virginia Beach, Virginia, 23456 or the Section 504 Coordinator at the student's school. For students who are eligible or suspected of being eligible for special education or related services under IDEA, please contact the Office of Programs for Exceptional Children at (757) 263-2400, Plaza Annex/Family and Community Engagement Center, 641 Carriage Hill Road, Suite 200, Virginia Beach, VA 23452.

The School Division is committed to providing educational environments that are free of discrimination, harassment, and bullying. Students, staff, parents/guardians who have concerns about discrimination, harassment, or bullying should contact the school administration at their school. Promptly reporting concerns will allow the school to take appropriate actions to investigate and resolve issues. School Board Policy 5-7 addresses non-discrimination and anti-harassment, Policy 5-44 addresses sexual harassment and discrimination based on sex or gender. Policy 5-36 and its supporting regulations address other forms of harassment.

Alternative formats of this publication which may include taped, Braille, or large print materials are available upon request for individuals with disabilities. Call or write the Department of Teaching and Learning, Virginia Beach City Public Schools, 2512 George Mason Drive, P.O. Box 6038, Virginia Beach, VA 23456-0038. Telephone 263-1070 (voice); fax 263-1424; 263-1240 (TDD) or email him at George.Coker@vbschools.com.

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CHARTING THE COURSE

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