
Salisbury University Department of Mathematical Sciences
**MATH 310 : Calculus III
Syllabus (Tentative)**

Description: Arc length, indeterminate forms, Euclidean spaces, functions of several variables, partial differentiation, multiple integrals. 4 Hours Credit: Meets four hours per week.

Prerequisites: C or better in MATH 202.

Intended Audience: Mathematics and physics majors, students interested in the dual degree engineering transfer program, and students seeking continued and demanding study in mathematics beyond single variable calculus.

Objective: To further understand the mathematics that underlies modern science, with emphasis on applications, approximations, and the role of proof. To develop and understand the relationships among verbal, algebraic, and graphical representations of two- and three- dimensional objects. To understand how single-variable calculus generalizes to higher dimensions.

Textbooks: *Calculus: Early Transcendentals*, 9th Edition, by James Stewart, Cengage Learning, 2016.

Technology: Subscription to WebAssign is required. Use of Mathematica (available in campus labs and free for download for students) incorporated at the discretion of the instructor.

Topic	Weeks
Vectors and the Geometry of Space (Chapter 12)	2
Three-dimensional coordinate systems and vectors; dot and cross products; equations of lines, planes, spheres, and other common surfaces in space.	
Vector Functions (Chapter 13)	2
Vector functions and space curves; calculus of vector functions; arc length and curvature; velocity, acceleration and motion in space.	
Multivariable Functions and Partial Derivatives (Chapter 14)	3
Functions of several variables; limits, continuity and differentiability; tangent planes and linear approximation; chain rules; directional derivatives and gradients; extrema of functions and the second derivatives test; Lagrange multipliers.	
Multiple Integrals (Chapter 15)	3
Double integrals over rectangles and general regions; iterated integrals; double integrals in polar coordinates and their applications; triple integrals in rectangular, cylindrical, and spherical coordinates; change of variables.	
Vector Calculus (Chapter 16)	3
Vector fields and the Fundamental Theorem of Line Integrals; Green's Theorem; curl and divergence; parametric surfaces and surface integrals; Stokes's Theorem and the Divergence Theorem (Gauss's Theorem).	
Examinations	1
Total	14

Evaluation

Examinations	35 – 60%
Assignments/Quizzes	20 – 40%
Comprehensive Final Examination	20 – 40%

- Clear descriptions of thought processes, evidence of critical thinking, and effective communication must be demonstrated in written work.

- **Writing Across the Curriculum:** Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors' office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**
- **NOTE:** Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.