The University of North Carolina at Greensboro
Department of Mathematics and Statistics

Calculus III MAT 293–01 Spring 2017 Syllabus

Time and Place MWF 2:00–2:50 Petty 150
Instructor Dr. Igor V. Erovenko
Office Petty 106
Office Hours M 3–4 WF 11–12 and by appointment
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Prerequisites Grade of C or better in MAT 292.

For Whom Planned This course is the third of a four semester Calculus sequence, primarily for STEM (science, technology, engineering, and math) students. Students must earn a grade of C or better in this course to satisfy prerequisites for MAT 320 (Introduction to Topology), MAT 394 (Calculus IV), and MAT 395 (Introduction to Mathematical Analysis).

Catalog Description Infinite sequences and series, conic sections, polar coordinates, vectors in dimensions two and three, vector-valued functions.

Student Learning Outcomes Upon successful completion of this course, students will be able to:

- Define limits of sequences of real numbers, convergent and divergent series, vector-valued functions.
- Give examples of quadric surfaces in three-dimensional space.
- Compute limits of sequences of real numbers, radii of convergence of power series, arc lengths and areas with polar functions, dot product and cross product of two vectors, derivatives and integrals of vector-valued functions.
- Compare and contrast convergent and divergent sequences, convergent and divergent series, absolutely convergent and conditionally convergent series.
- Combine different tests to analyze a series and determine its convergence properties.
- Support and justify statements with rigorous mathematical arguments.

Teaching Methods and Assignments for Achieving Learning Outcomes The course material will be presented via traditional lectures. Achievement of learning outcomes will be facilitated via

- Homework assignments: Regular homework assignments will be collected and graded. Each homework will cover two sections of text on average.
- Quizzes: There will be regular in-class quizzes based on problems similar to those from homework assignments.
- Tests and a comprehensive final examination.

Evaluation and Grading The following weight distribution is going to be used to determine your final grades:

Homework	15%
Quizzes	10%
Tests	45% (three at 15% each)
Final Exam	30%

The following grading scale will be used to determine your final letter grades:

A+	97–100	B+	87–90	C+	77–80	D+	67–70		
A	93–97	B	83–87	C	73–77	D	63–67	F	below 60
A–	90–93	B–	80–83	C–	70–73	D–	60–63		

You need to show all steps of your work to get full credit for any problem. If your method is correct, but you made a computational error and your final answer is wrong, then you will receive certain partial credit. If, however, you obtain a correct answer without providing any plausible explanation or showing your work, then you will receive a score of 0.

Required Texts Taalman and Kohn, *Calculus*, W.H. Freeman and Company, 2014.

Topical Outline/Calendar Below is a tentative calendar for the course. Test markers indicate topic cut offs rather than actual test dates.

Week	Material Covered	Tests
1	Sequences; limits of sequences	
2	Series; introduction to convergence tests	
3	Comparison tests; the ratio and root tests	
4	Alternating series	**Test 1**
5	Power series; Maclaurin series and Taylor series	
6	Convergence of power series	
7	Differentiating and integrating power series	
8	Parametric equations; polar coordinates	
9	Graphing polar equations	
	Computing arc length and area with polar functions	**Test 2**
10	Cartesian coordinates; vectors	
11	Dot product; cross product	
12	Lines in three-dimensional space; planes	**Test 3**
13	Vector-valued functions; the calculus of vector functions	
14	Review	

If time permits, we will also cover unit tangent and unit normal vectors, and arc length parametrizations and curvature.

Academic Integrity Policy Students are expected to adhere to the UNCG *Academic Integrity Policy* available at `http://academicintegrity.uncg.edu`.

Attendance Policy Regular and punctual attendance is expected. If you miss a class you are responsible for the material covered and for any assignments made; you will also get a grade of zero for a missed quiz. If you miss a test or the final exam, you should expect a score of zero, unless you have contacted me *in advance* and agreed upon a procedure to make it up. Make-up tests will be allowed with a valid excuse only, which does not include your personal convenience. Early exams cannot be administered for any reason.

Final Examination A comprehensive final examination will take place on Wednesday, May 10, at 12:00–3:00 pm.