Salisbury University Department of Mathematical Sciences

MATH 452/552 :   Analysis II
Syllabus (Tentative)

Description: Modern abstract analysis including such topics as convergence of infinite series, sequences of functions, metric spaces, integration, topology of the real number system and continuity. 4 Hours Credit: Meets four hours per week.

Prerequisites: C or better in MATH 451.

Intended Audience: All majors in the mathematical sciences and any students who wish to pursue graduate study in Mathematics or its applications, physics or engineering.

Objective: To develop the foundations for the analysis of real valued functions. The primary focus will be on proof.

Textbooks: *An Introduction to Analysis*, 2nd Edition by Bilodeau, Thie and Keough required. *Real Analysis* 4th edition by H. L. Royden and P. M. Fitzpatrick on reserve in the library.

Topic	Weeks
Review of Analysis I	1
Completeness, Convergence, The Derivative Mean Value Theorem; Differentiability in R2	
Integration	2
Upper and lower sums, Reimann Sums Definition, properties and existence of the Integral, The Fundamental Theorem of Calculus; Improper and Double Integrals	
Infinite Series	3.5
Basic Theory; Absolute Convergence, Power Series, Taylor Series.	
Sequences and Series of Functions	3
Uniform Convergence; Consequences of Uniform Convergence; Classic surprising examples.	
Introduction to Differential Equations	2
Elementary First Order Differential Equations, Existence and Uniqueness; Power Series Solutions	
Preview of Grad-level Analysis; Introduction to Measure Theory	1
Open and Closed sets, Borel Sets; Countability and Completeness.	
Tests and review	1.5
Total	**14**

Evaluation

Portfolio	20%
Boardwork and Quizzes	$10 - 15\%$
Written Homework	$15 - 30\%$
Tests and Final	$40 - 50\%$

- Graduate students will be assigned special homework/test problems or projects.

- 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.