

Tennessee Technological University
Mathematics Department

MATH 4110-4120/5110-5120: Advanced Calculus I-II

I. COURSE DESCRIPTION FROM CATALOG:

Rigorous treatment of functions of one and several variables, improper integrals, sequences, infinite series, uniform convergence and applications. Students are expected to improve their ability to work in an abstract setting using precise definitions and formal proofs and to present their work in class. Lec. 2-2 Rec. 2-2 Credit 3-3.

II. PREREQUISITE(S):

MATH 4110 (5110): C or better in MATH 3400 or consent of instructor.

MATH 4120 (5120): C or better in MATH 4110 or 5110.

III. COURSE OBJECTIVE(S): One of the main objectives of the course is to bridge the gap between undergraduate calculus to graduate courses by giving rigorous treatment of topics like real number system, sequences and series, continuity, differentiation, integration in one and higher dimensions, and uniform convergence.

IV. TOPICS TO BE COVERED:

- (4110)**
1. Basic Metric Space topology
 2. Limits and continuity for functions of several variable and vector-valued functions
 3. Differentiation for functions of several variables and vector-valued functions
 4. Riemann Integrals or Riemann-Stieltjes Integrals
 5. Numerical Sequences and Series
 6. Sequences and series of functions
- (4120)**
- Section 6.5 Sequences
 - 6.6 Compactness
 - 6.7 Connectedness
 - Section 7.1 The Weierstrass Theorem
 - 7.2 Lengths of Paths
 - 7.3 Fourier Series
 - Chapter 8 Differentiable Maps
 - Chapter 9 Measures
 - Chapter 10 Integration

V. ADDITIONAL INFORMATION:

Graduate credit is earned on the basis of additional work required by the instructor [per 2005-2006 TTU Graduate Bulletin], page 38.

VI. POSSIBLE TEXTS AND REFERENCES:

MATH 4120/5120 – *Methods of Real Analysis, 2nd ed.* by Goldberg

MATH 4110/5110 - *Principles of Mathematical Analysis* by Rudin

MATH 4120/5120 - *Mathematical Analysis: An Introduction* by Andrew Browder

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). 1
An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119.

VII. ANY TECHNOLOGY THAT MAY BE USED:

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