Tennessee Technological University
Mathematics Department

MATH 6410-6420: Real Analysis I-II

I. COURSE DESCRIPTION FROM CATALOG:

Theory of Lebesgue measure and integration, L^p spaces. Integration in locally compact space. Lec.3-3. Cr.3-3.

II. PREREQUISITE(S):

MATH 6410: C or better in MATH 4120 or MATH 5120.
MATH 6420: C or better in MATH 6410.

III. COURSE OBJECTIVE(S):

This course is designed to introduce the student to the study of analysis of real-valued functions of one or several variables, with an emphasis on Lebesgue measure and Lebesgue integration on the real line and R^n. Topics in the area of point-set topology are included to allow the development of general measure and integration theory.

IV. STUDENTS LEARNING OUTCOMES:

MATH 6410
Students will know and understand the construction of Lebesgue measure and the Lebesgue integral on the real line.
Know and be able to apply the Monotone Convergence Theorem, Fatou's Lemma and the Lebesgue Dominated Convergence Theorem.
Know and understand function Lp spaces as examples of Banach spaces.

MATH 6420
Students will know and understand basic topological and metric spaces notion.
Know and understand the notion of general measure spaces and the Caratheodory construction of a measure induced by an outer measure.
Know and be able to apply the Radon-Nikodym Theorem.

V. TOPICS TO BE COVERED:

(6410) Basics of Set Theory and the Real Number System, Measure and Lebesgue Integration, Differentiation, L^p spaces
(6420) Metric Spaces, Topological Spaces, including Compact and Locally Compact Spaces, General Measure and Integration Theory

VI. ADDITIONAL INFORMATION:

VII. POSSIBLE TEXTS AND REFERENCES:

Real Analysis, 4th edition, by Royden

VIII. ANY TECHNOLOGY THAT MAY BE USED:

IX. STUDENT ACADEMIC MISCONDUCT POLICY:

Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – Student Academic Misconduct at Policy Central.

X. DISABILITY ACCOMMODATION:

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). 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. For details, view the Tennessee Tech's Policy 340 – Services for Students with Disabilities at Policy Central.