Tennessee Technological University
Mathematics Department

MATH 6540: Calculus of Variations and Applications

I.   COURSE DESCRIPTION FROM CATALOG:
Euler equations, constraints, Lagrange multipliers, Ritz method, applications. Lec. 3. Cr. 3.

II.   PREREQUISITE(S):
Consent of instructor

III.   COURSE OBJECTIVE(S):
This course is designed to provide for the graduate student in mathematics, science, or engineering an introduction to the ideas and techniques of the calculus of variations. The mathematics are also illustrated.

IV.   STUDENT LEARNING OUTCOMES:
Students learn the origin of Calculus of Variation from various historically famous problems. Students will review and prepare basic knowledge in functional analysis in order to solve problems of different types. Upon successfully completion the course, students will be able to apply appropriate techniques to solve optimization problems in their applied researches.

V.   TOPICS TO BE COVERED:
Chapter 1: Elements of the Theory
Chapter 2: Further Generalizations
Chapter 3: The General Variation of a Functional
Chapter 8: Direct Methods in the Calculus of Variations

VI.   ADDITIONAL INFORMATION:

VII.   POSSIBLE TEXTS AND REFERENCES:
Calculus of Variations & Applications, by Gelfand
The Calculus of Variation, by Brunt

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 Accessible Education Center (AEC). An Accommodation Request (AR) should be completed as

soon as possible, preferably by the end of the first week of the course. The AEC is located in the Roaden University Center, Room 112; phone 931-372-6119. For details, view the Tennessee Tech's Policy 340 – [Services for Students with Disabilities at Policy Central](#).