Tennessee Technological University
Mathematics Department

MATH 3400: Introduction to Concepts of Mathematics

I. COURSE DESCRIPTION FROM CATALOG:

A rigorous treatment of elements of logic and set theory including propositional calculus (statements, connectives, conditionals, negation), quantifiers, sets and operations on sets, mappings, equivalence relations, mathematical induction. Students are expected to work in an abstract setting using precise definitions and formal proofs. Lec. 2 Rec. 2. Cr. 3.

II. PREREQUISITE(S):

C or better in MATH 1920

III. COURSE OBJECTIVE(S):

To learn to prove theorems, to write proofs up in good style, and generally to understand and appreciate the role of inductive reasoning, deductive reasoning, and proof in mathematics.

IV. TOPICS TO BE COVERED:

Truth tables, propositional calculus, quantifiers, predicate calculus, methods of proof, proving theorems, sets, mathematical induction, relations, equivalence relations, one-to-one and onto functions, images and inverse images of sets and composition of functions.

V. ADDITIONAL INFORMATION:

Lecture and recitation

VI. POSSIBLE TEXTS AND REFERENCES:

The Structure of Proof with Logic and Set Theory, Michael O'Leary, Prentice Hall, 1st edition, 2002.
A Transition to Advanced Mathematics by Smith, Eggin & St. Andre, 5th edition
A Primer of Abstract Mathematics by Robert Ash
Conjecture and Proof by Miklos Laczkovich
Foundations of Abstract Mathematics by Kurtz
An Introduction to Abstract Mathematics by Bond and Keane
Proofs & Fundamentals by Bloch
Nuts & Bolts of Proofs by Cupillari

VII. ANY TECHNOLOGY THAT MAY BE USED: