Tennessee Technological University
Mathematics Department

MATH 6450/CSC 6450: Advanced Theory of Computation

I. COURSE DESCRIPTION FROM CATALOG: A rigorous treatment of the theory of computation. Topics such as: computable functions, the Church-Turing thesis, complexity theory, and P vs. NP. Lec. 3. Cr. 3.

II. PREREQUISITE(S): Consent of instructor (previous coursework involving proofs and some programming experience are needed)

III. COURSE OBJECTIVE(S): To gain an understanding of the mathematics which underlies the theory of computation.

IV. TOPICS TO BE COVERED: The following are some appropriate topics for this class. Establish the equivalence of several different definitions of computable functions, i.e., recursive functions, functions computable in a model programming language and functions computable by a Turing machine. Grammars, regular languages, and automata. Complexity of algorithms in time and space, including "big O" and "little o" notation. The P vs. NP problem and the theory of NP completeness.

V. ADDITIONAL INFORMATION:
This course may be cross-listed as CSC 6450. Please ask departmental secretary to enter it as a cross-listed course in TTUMIS.

VI. POSSIBLE TEXTS AND REFERENCES:
Computability, Complexity, & Languages 2nd ed., by Davis

VII. ANY TECHNOLOGY THAT MAY BE USED: