

**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 2<sup>nd</sup> ed.*, by Davis
- VII. ANY TECHNOLOGY THAT MAY BE USED:**

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.