CSC/CPE 540 Theory of Computation II

1. CSC/CPE 540 Theory of Computation II

2. credit units 4 contact hours 4

3. Course Coordinator: Hasmik Gharibyan

4. Textbook: (and/or other required material) no required textbook

5. a. Course Description: Advanced topics in theoretical computer science from such areas as automata theory, cellular automata theory, computational complexity, and program verification. 4 seminars.

   b. Prerequisite: CSC 445 and graduate standing, or consent of instructor.

   c. Required/Elective/Selective Elective for CPE, CSC, EE, SE


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6. a. Course Learning Objectives

   The student will be able to:
   • Analyze and explain advanced topics in theory of computation.
   • Discuss different applications of computational theory to practical design not only in the CS field but in other disciplines as well.
   • Evaluate classical, as well as current research papers on different topics in theoretical computer science.
   • Critique texts/papers on advanced topics in theoretical computer science.
   • Present topics in theoretical computer science to an audience of peers.

   b. Level at which Student Outcomes are addressed

   (“B” = Basic level, “I” = Intermediate level, “A” = Advanced level)


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7. Major Topics Covered: (number of lecture hours each)

   • Theory of languages and automata; its applications in different disciplines.
   • Turing machines and their use as a model of computation in different disciplines.
   • Other types of abstract machines (e.g. cellular automata); their properties and applications.
   • Computational complexity, complexity classes, NP-completeness.
   • Undecidable problems, uncomputable functions.

   Note: This is a seminar class. For their presentations students choose papers from a provided list. Thus in different quarters the time spent on each topic may vary.