Course Syllabus	**EECS 4100 – Theory of Computation**
Credits & Contact hours	3 credit hours & 150 minutes lecture contact hours per week.
Coordinator	Dr. Henry Ledgard
Textbook	Introduction to Languages and the Theory of Computation - Fourth edition John Martin, 2006
Course Information	Examines formal models of automata and languages. Finite-state automata, regular languages, pushdown automata, context-free languages, Turing machines, decidability, reducibility, and P vs NP complexity classes. Prerequisites: EECS 2510 and EECS 2520 Required course
Specific Goals- Students Learning Objectives (SLOs)	The students will be able to 1. Devise a variety of simple proofs. 2. Define what a Regular Language is and construct a finite state machine for it. 3. Construct equivalent representations among Regular Languages, Regular Expressions, and Regular Grammars. 4. Formulate a grammar defining the syntax of common programming languages. 5. Be able to formulate the equations for pushdown automaton. 6. Understand Turing Machines and the simple primitive mechanisms needed for all computation. 7. Understand recursive and recursively enumerable languages. 8. Identify the characteristics of problems for which no computational solution exists. 9. Understand the concepts of P vs. NP vs. NP-complete.
Topics	1. Regular Languages 2. Finite Automata 3. Non-determinism 4. Regular Expressions 5. Non-regular Languages 6. Context-Free Languages 7. Pushdown Automata 8. Non-context-free Languages

9. Computability Theory
10. Church-Turing Thesis
11. Turing Machines
12. Variants of Turing Machines
13. Decidability
14. Decidable Languages
15. The Halting Problem
16. Post Correspondence Problem
17. Reducibility
18. Definitions of P, NP, NP-complete and PSPACE
19. NP-complete problems