

<b>Course Title:</b>	<b>CS-815 Theory of Automata-II</b>
<b>Credit Hours:</b>	3+0
<b>Course Description:</b>	This course will provide students with an understanding of the underlying theory of Automata.
<b>Textbooks:</b>	<ul style="list-style-type: none"> <li>• Michael Sipser, “Introduction to the Theory of Computation”, 3rd Ed., Cengage Learning, 2013</li> </ul>
<b>Reference Books:</b>	<ul style="list-style-type: none"> <li>• John C. Martin, “Introduction to Languages and the Theory of Computation”, 4th Ed., McGraw Hill, 2011.</li> <li>• J.E. Hopcroft, R. Motwani and J.D. Ullman, “Introduction to Automata Theory, Languages and Computation”, 2nd Ed., Addison-Wesley 2001</li> <li>• Elaine A. Rich “Automata, Computability and Complexity: Theory and Applications”, Prentice Hall, 2013</li> <li>• Papadimitriou, Computational Complexity</li> </ul>
<b>Course Contents:</b>	Deterministic Finite Automata, Formal description with examples, Designing DFA, Non-deterministic finite automata, Equivalence between NFA and DFA, Regular expressions and their algebra, Pumping lemma for regular languages, Context free grammars and languages, Pushdown automata, Equivalence between PDA and CFG, Turing machines and its variants, Universal Turing machine, Decidability and the notion of tractability, P vs NP discussion, Cook’s theorem, Computability theory, Rice’s theorem, Reducibility