

Course Name: Formal Language and Automata Theory	Course Code: ITSE4100
Pre-Requisite: 1) Data Structure and Algorithms 2) Discrete Structures	Credit Hours: 3
Passing Grade: C	Level: Year 4
No. Of Theory & Practical Hours : 2:2	
Goal: Provides students the concepts of theory of computation and abstract models of computation	
Objectives: The course should enable the student to: <ol style="list-style-type: none"> 1. Explain formal definitions of machine models. 2. Construct finite state machines and the equivalent regular expressions. 3. Construct automata and the equivalent context free grammars. 4. Construct Turing machines. 5. Prove the equivalence of languages described by state machines, regular expressions, grammars and Turing machines. 6. Discuss decidability, reducibility and complexity of languages. 7. Use a tool to construct automata. 	
Outcomes At the end of this course, students should be able to:	Method
<ol style="list-style-type: none"> 1) Describe the formal relationships among machines, languages and its grammars 2) Apply theorems and recurrence relations 3) Construct finite state machines and regular expressions to solve problems in computing 4) Convert finite automata to regular expressions and vice versa. 5) Construct context-free grammars for simple languages 6) Construct Turing Machines to solve simple recognition problems 7) Apply pumping lemma to languages. 8) Discuss Bounded Automata and Chomsky's Languages hierarchy. 9) Discuss Polynomial(P), Nondeterministic Polynomial time (NP) and NP-complete problems 10) Use a tool to construct automata. 	<p>Theory</p> <p>Theory and Practical</p> <p>Theory and Practical</p> <p>Theory and Practical</p> <p>Theory and Practical</p> <p>Theory and Practical</p> <p>Theory and Practical</p> <p>Theory</p> <p>Theory</p> <p>Practical</p>

Hardware /Software Tools: JFlap, Automata Editor
Text Book: Refer to the Course Material
Reference Book: <ol style="list-style-type: none"> 1) Hopcroft J. E., Motwani R, Ullman J.D. "Introduction to Automata Theory, Languages, and Computation", 2nd edition 2001 Addison-Wesley 2) Webber A, "Formal Language: A practical Introduction" 2008. Franklin, Beedle & Associates, Inc. 3) Chandrasekaran , Mishra, "Theory of Computer Science (Automata, Languages, and Computation), PHI, 2003

