3. Formal Languages and Automata Theory (CS-119) **(4-0-0)**

Regular language Models: Finite state machines (deterministic, non-deterministic), regular languages and regular grammars, properties; Context-free language models: Context-free languages, properties of CFL, Pushdown automata; Turing Machines, limits of algorithmic computation; Grammars, hierarchy of formal languages, properties of models of computation, Computational complexity, complexity class P and NP.

Reference:

1. Linz, Peter, An introduction to Formal Languages and Automata, Narosa Publishing House, 2007.
2. Lewis, H.R., and Papadimitriou, C.H., Elements of Theory of Computation, Pearson Education, 2002.
3. Hofcroft, J.E., and Ullman, J.D., Introduction to Automata Theory, Languages and Computation, Narosa Publishing House, 2008.
4. Krithivasan, Kamala, Introduction to Automata Theory, Languages and Computation, Pearson Education, 2009.
5. Martin, J.C., Introduction to Languages and Theory of Computation, Tata McGraw-Hill Publication, 2007.