Introduction to Formal Languages and Automata Theory

0. Basic concepts and constructions:
    a. Mathematics
    b. Linguistics
    c. System theory
    d. Information theory

1. Subrecursive algorithms

    1.1. Finite automata and regular languages (*automation of processes*)

    1.2. Pushdown automata and context-free languages (*processing languages*)

2. Recursive algorithms

    2.1. Turing machines and recursively enumerable languages (*automated behavior of people*)

        2.1.1. Computability and Decidability

        2.1.2. Complexity and Tractability

    2.2. Partial recursive functions (*computing with functions*)

3. Superrecursive algorithms

    3.1. Inductive Turing machines and inductively computable languages (*automation of processes that do not stop*, e.g., operating systems, networking, search engines, etc.)

        3.1.1. Computability and Decidability

        3.1.2. Complexity and Tractability

    3.2. Cellular automata, grid automata and computer networks (*concurrent computations*)

Required Textbooks:

Hopcroft, J., Motwani, R. and Ulman, J. *Introduction to Automata Theory, Languages and Computation*, Third Edition, Addison-Wesley, 2007

Burgin, M. *Superrecursive algorithms*, Springer Verlag, 2005