

**BCA (HONS) 5th SEMESTER
DISCIPLINE SPECIFIC COURSE (CORE)**

BCA520C2: THEORY OF COMPUTATION

**CREDITS: THEORY: 4; TUTORIAL: 2
MAX. MARKS: THEORY: 60; TUTORIAL: 30
MIN. MARKS: THEORY: 24; TUTORIAL: 12**

THEORY: 60 LECTURES

UNIT-I

1. Languages (15 Lectures)

Alphabets, string, language, Basic Operations on language, Concatenation, KleeneStar

UNIT-II

2. Finite Automata and Regular Languages (15 Lectures)

Regular Expressions, Transition Graphs, Deterministic and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma and closure properties of regular languages.

UNIT-III

3. Context free languages (15 Lectures)

Context free grammars, parse trees, ambiguities in grammars and languages, Pushdown automata (Deterministic and Non-deterministic), Pumping Lemma, Properties of context free languages, normal forms.

UNIT-IV

4. Turing Macines and Models of Computations (15 Lectures)

RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, Recursively enumerable and recursive languages, unsolvability problems.

Recommended Books:

1. Daniel I. A. Cohen, Introduction to computer theory, John Wiley, 1996
2. Lewis & Papadimitriou, Elements of the theory of computation, PHI 1997.
3. Hoperoft, Aho, Ullman, Introduction to Automata theory, Language & Computation -3rd Edition, Pearson Education. 2006
4. P. Linz, An Introduction to Formal Language and Automata 4th edition Publication Jones Bartlett, 2006

TUTORIAL: 2 CREDITS; 30 LECTURES