INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT/CENTRE: **Electronics and Computer Engineering**

1. Subject Code**: EC - 254**   Course Title: **Discrete Structures**

2. Contact Hours: **L: 3   T: 1   P: 0**

3. Examination Duration (Hrs.):   **Theory** | 0 | 3 | **Practical** | 0 | 0 |

4. Relative Weight**:**   **CWS** | 25 | **PRS** | 00 | **MTE** | 25 | **ETE** | 50 | **PRE** | 00 |

5. Credits**:** | 0 | 4 | 6. Semester | | | √ | | |
                                        Autumn   Spring   Both

7. Pre-requisite**: NIL**

8. Subject Area**: DCC**

9. Objective: To introduce to the students the fundamental discrete structures used in computer science.

10. Details of the Course:

Sl. No.	Contents	Contact Hours
1.	**Sets:** Properties, relations, functions, finite and infinite sets, lattice.	6
2.	**Graphs:** Directed, undirected, directed acyclic, and bipartite graphs; Connected components, Eulerian graphs, Hamiltonian cycles; Some fundamental theorems, applications.	10
3.	**Logic:** Propositional and predicate logic; Syntax, semantics, resolution principle, soundness, completeness, unification, inferencing; Applications.	10
4.	**Abstract Algebra:** Groups, rings, fields, Galois field, Euler's phi function, Fermat's theorem, discrete logarithm, applications.	10
5.	**Introduction to Number Theory:** Remainder theorem, gcd, factorization theorem.	6
	Total	**42**

11. Suggested Books:

Sl. No.	Name of Books/Authors	Year of Publication
1.	Herstein, I., "Abstract Algebra", Pearson Education.	2005
2.	Harary, F., "Graph Theory", Narosa Publishing House.	2001
3.	Huth, M. and Ryan, M., "Logic in Computer Science: Modeling and Reasoning About Systems", Cambridge University Press.	2005