RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech. : Computer Science & Engineering
2nd Year - IV Semester

SN	Category	Course Code	Course Title	L	T	P	Exm Hrs	IA	ETE	Total	Cr
				THEORY							
1	BSC	4CS2-01	Discrete Mathematics Structure	3	0	0	3	30	120	**150**	**3**
2	HSMC	4CS1-03/ 4CS1-02	Managerial Economics and Financial Accounting /Technical Communication	2	0	0	2	20	80	**100**	**2**
3	ESC	4CS3-04	Microprocessor & Interfaces	3	0	0	3	30	120	**150**	**3**
4	PCC	4CS4-05	Database Management System	3	0	0	3	30	120	**150**	**3**
5		4CS4-06	Theory of Computation	3	0	0	3	30	120	**150**	**3**
6		4CS4-07	Data Communication and Computer Networks	3	0	0	3	30	120	**150**	**3**
			Sub Total	**17**	**0**	**0**		**170**	**680**	**850**	**17**
			PRACTICAL & SESSIONAL								
7	PCC	4CS4-21	Microprocessor & Interfaces Lab	0	0	2		30	20	**50**	**1**
8		4CS4-22	Database Management System Lab	0	0	3		45	30	**75**	**1.5**
9		4CS4-23	Network Programming Lab	0	0	3		45	30	**75**	**1.5**
10		4CS4-24	Linux Shell Programming Lab	0	0	2		30	20	**50**	**1**
11		4CS4-25	Java Lab	0	0	2		30	20	**50**	**1**
12	SODE CA	4CS8-00	Social Outreach, Discipline & Extra Curricular Activities							**25**	**0.5**
			Sub- Total	**0**	**0**	**12**		**180**	**120**	**325**	**6.5**
			TOTAL OF IV SEMEESTER	**17**	**0**	**12**		**350**	**800**	**1175**	**23.5**

*L: Lecture, **T:** Tutorial, **P:** Practical, **Cr:** Credits*

*ETE: End Term Exam, **IA:** Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

II Year-IV Semester: B.Tech. Computer Science and Engineering

4CS2-01: Discrete Mathematics Structure

Credit: 3   **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P   **End Term Exam: 3 Hours**

SN	Contents	Hours
1	**Introduction:** Objective, scope and outcome of the course.	1
2	**Set Theory:** Definition of sets, countable and uncountable sets, Set operations, Partition of set, Cardinality (Inclusion-Exclusion & Addition Principles) Venn Diagrams, proofs of some general identities on sets. **Relation:** Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, Job-Scheduling problem. **Function:** Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction, Proof by contradiction. Composition of Functions. The Pigeonhole and Generalized Pigeonhole Principles.	7
3	**Propositional Logic:** Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, Universal and existential quantifiers. 2 way predicate logic. Introduction to finite state machine Finite state machines as models of physical system equivalence machines, Finite state machines as language recognizers.	8
4	**Posets, Hasse Diagram and Lattices:** Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices. **Combinatorics:** Introduction, Permutation and combination, Binomial Theorem, Multimodal Coefficients Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms, linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions, Generating functions, Solution by method of generating functions.	8
5	**Algebraic Structures:** Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.	8
6	**Graph Theory:** Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs, matching, vertex/edge covering.	8
	Total	**40**