PARUL UNIVERSITY - Faculty of Engineering and Technology

Department of Computer Science & Engineering

SYLLABUS FOR 4th Sem BTech PROGRAMME

Competetive Coding Level -2A

Type of Course: BTech

Prerequisite: Computer Programming and Basic Syntaxes

Rationale: Learner will be able to attempt all the coding examinations in the market

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Teaching Scheme			Credit	Examination Scheme					Total
				External		Internal			
Lect Hrs/	Tut Hrs/	Lab Hrs/		T	P	T	CE	P	
3	0	0	3	60	-	20	20	-	100

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Introduction**: **Stacks** -Construction -Operations -Stack stacked Queues -Construction -Operations -Queue Queued	10%	6
2	LinkedLists -Construction -operations -Merging Two Sorted Lists -Merge Point of Two Sorted Lists -nth node from the end -Swap Nodes Pair wise	15%	8
3	Trees -Introduction -Types of Trees -Binary Trees -Tree Traversals -Views of Binary Tree(Top view, Bottom View)	10%	5

4	Binary Trees -Mirrored Trees -Sum Tree or Not -Height and Diameter of a Binary Tree -Sum from Root to leaf Path -Ancestors of a Binary tree -Lowest Common Ancestor of a Binary Tree -Binary Search Tree -Construction -Insertion and Deletion	10%	5
5	Priority Queues -Construction -Max Heap -Min Heap -Heap Sort	10%	4
6	Introduction to Hashing. Index Mapping (or Trivial Hashing) Separate Chaining for Collision Handling. Open Addressing for Collision Handling. Double Hashing. Load Factor and Rehashing.	15%	8
7	Introduction to Tries, Making a Trie Node Insert, Search and Remove operation implementation in Tries, Types of Tries, Huffman Coding	10%	5
8	Longest Word with all Prefixes Number of Distinct Substrings in a String Maximum XOR of Two numbers in an Array Count Words in a Trie	15%	9

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

Introduction to Algorithms By Thomas H . Cormen, Charles E. Leiserson: ...
Competitive Programming 3 by Steven Halim: ...
Guide to Competitive Programming by Antti Laaksonen: ...
Programming Challenges by Steven S Skiena: ...
The Algorithm Design Manual By Steven S Skiena:

Course Outcome:

1. Judge time complexity rules during problem solving.

2.Apply sorting algorithms to data structures to solve problems.

3. Select the best data structure to solve the given problem.

4. Solve given problems using different Problem Solving Techniques.