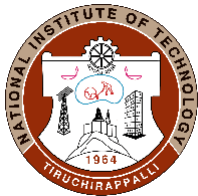


COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech Computer Science and Engineering		
Course Title	Data Structures and Algorithms		
Course Code	CSMI11	No. of Credits	3
Course Code of Pre-requisite subject(s)	NIL		
Session	Jan2021	Section (if, applicable)	A & B
Name of Faculty	Dr. B. Nithya Dr. K. Sitara	Department	CSE
Official Email	nithya@nitt.edu sitara@nitt.edu	Telephone No.	0431-2503214
Name of Course Coordinator(s) (if, applicable)	Not Applicable		
Official E-mail	-	Telephone No.	-
Course Type (please tick appropriately)	<input type="checkbox"/> Minor course		
Syllabus (approved in BoS)			
<p>Unit – I Development of Algorithms Notations and analysis - Storage structures for arrays - Sparse matrices - Stacks and Queues: Representations and applications. linked lists –Doubly linked lists- Circular linkedlists.</p> <p>Unit – II Trees Preliminaries – Binary Trees – Search Tree ADT – Binary Search Trees – Hashing: ADT Hash Function – Separate Chaining – Open Addressing – Rehashing – ExtendibleHashing</p> <p>Unit –III Graphs Representation of graphs - BFS, DFS - Topological sort- Shortest path problems - Dijkstra's algorithm, Floyd- Warshall, Minimum spanning trees- prims algorithm, Kruskal algorithm.</p> <p>Unit –IV Algorithmic paradigms Divide and Conquer method - Strassen's matrix multiplication - Greedy method - Knapsack problem – Job sequencing with deadlines – Dynamic Programming- Travelling salesman problem.</p> <p>Unit – V Searching and Sorting Techniques Selection, Bubble, Insertion, Merge, Quick, and Radix sort - Address calculation - Linear search - Binary search.</p> <p>Text Book 1. J. P. Tremblay and P. G. Sorenson, "An Introduction to Data Structures with applications", Second Edition, Tata McGraw Hill, 1981</p>			



Reference Book

1. SartajSahni, "Data Structures, Algorithms and Applications in C++", UniversitiesPressPvt. Ltd.
2. T. Cormen, C. Lieserson, R. Rivest, and C. Stein, "Introductions to Algorithms", Prentice-Hall/India, 3rd edition, 2009
3. M. Tenenbaum and Augestien, "Data Structures using C", Third Edition, Pearson Education2007.

COURSE OBJECTIVES

- To understand the various techniques of sorting and searching
- To design and implement arrays, stacks, queues, and linked lists
- To understand the complex data structures such as trees and graphs
- To design and implement various programming paradigms and its complexity

MAPPING OF COs with Pos

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Develop programs to implement linear data structures such as stacks, queues, linked lists, etc.	1,2,3,6,11
2. Apply the concept of trees and graph data structures in real world scenarios	1,3,6
3. Comprehend the implementation of sorting and searching algorithms	1,2,4
4. Handle data in different algorithms	2,11

COURSE PLAN – PART II

COURSE OVERVIEW

This course emphasizes linear and nonlinear data structures, various programming paradigms, sorting and searching problems.

COURSE TEACHING AND LEARNING ACTIVITIES

(Add more rows)

S.No.	Week/Contact Hours	Topic	Mode of Delivery Online Mode
1	3 Contact Hours	Notations and analysis - Storage structures for arrays - Sparse matrices - Stacks – Representations -Operation	PPT
2	4 Contact Hours	Stack Applications Queue- Representation- Operations- Application	PPT
3	5 Contact Hours	Single linked list: Representations Single linked list Operations & programming examples Circular linked list & its operations Doubly linked list & its operations Stack, Queue using lists	PPT
4	4 Contact Hours	Binary trees, Expressions using binary tree - Binary Search Tree & its operation s Binary tree traversal , Threaded binary tree and related programming coding	PPT



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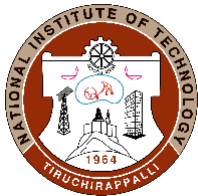
5	4 Contact Hours	Hashing: Hash function Separate Chaining - Open Addressing -Rehashing & Extensible Hashing	PPT
6	4 Contact Hours	Graphs, Representations Transitive closure, BFS, DFS Topological Sorting	PPT
7	4 Contact Hours	Minimum spanning trees (Prims & Kruskal) Shortest Path Problems (Dijkstra's & Warshall algorithm) Exercises	PPT
8	4 Contact Hours	Divide and Conquer method Strassen's matrix multiplication -Greedy method - Knapsack Problem	PPT
9	4 Contact Hours	Job sequencing with deadlines Dynamic programming Travelling salesman problem	PPT
10	3 Contact Hours	Sorting Techniques: Selection , Insertion & Bubble Merge, Quick and Radix sort Address Calculation & Shell Sort	PPT
11	3 Contact Hours	Heap Sort Searching: Binary and Linear Search	PPT

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	After completion of 2 units	1 Hr 30 min	25
2	Test 2	After completion of next 2 units	1 Hr 30 min	25
3	Programming Assignment with Viva	-	-	20
CPA	Retest	After cyle test 1 & cyle test 2	1 Hr 30 min	25
4	Final Assessment	As per Schedule	2hrs	30

***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)



- Feedbacks are collected before final examination through MIS or any other standard format followed by the institute
- Students, through their Class Representatives, may give their feedback at any time to the course faculty which will be duly addressed.
- The students may also give their feedback during Class Committee Meeting.

COURSE POLICY (including compensation assessment to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

E-mail/Phone

COMPENSATION ASSESSMENT

- One compensation assessment will be given after completion of Cycle Test 1 and 2 for the students those who are absent for any assessment due to genuine reason.
- The prior permission and required document must be submitted for the absence.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

The students can clarify their doubts at any time with their faculty member with prior appointments.

FOR APPROVAL

Course Faculty CC- Chairperson HOD



Guidelines

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.