



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech Computer Science and Engineering		
Course Title	Data Structures		
Course Code	CSPC21	No. of Credits	3
Course Code of Pre-requisite subject(s)	NIL		
Session	Aug 2020	Section (if, applicable)	B
Name of Faculty	Dr. B. Nithya	Department	CSE
Official Email	nithya@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"/> Core 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.</p> <p>Unit – II Linked Lists - Linked stacks and queues - Operations on polynomials - Doubly linked lists - Circularly linked lists - Dynamic storage management - Garbage collection and compaction.</p> <p>Unit – III Binary Trees - Binary search trees - Tree traversal - Expression manipulation - Symbol table construction - Height balanced trees - Red-black trees.</p> <p>Unit – IV Graphs - Representation of graphs - BFS, DFS - Topological sort - Shortest path problems. String representation and manipulations - Pattern matching.</p> <p>Unit – V Sorting Techniques - Selection, Bubble, Insertion, Merge, Heap, Quick, and Radix sort - Address calculation - Linear search - Binary search - Hash table methods.</p> <p>Text Books 1. J. P. Tremblay and P. G. Sorenson, "An Introduction to Data Structures with applications", Second Edition, Tata McGraw Hill, 1981 2. M. Tenenbaum and Augestien, "Data Structures using C", Third Edition, Pearson Education 2007.</p> <p>Reference Book</p>			



I. Sartaj Sahni, "Data Structures, Algorithms and Applications in C++", Universities Press (I) Pvt. Ltd.

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

MAPPING OF COs with Pos

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Ability to develop programs to implement linear data structures such as stacks, queues, linked lists, etc.	1,2,3,5
2. Ability to apply the concept of trees and graph data structures in real world scenarios	1,3,4,6
3. Ability to comprehend the implementation of sorting and searching algorithms	1,3,5,6

COURSE PLAN – PART II

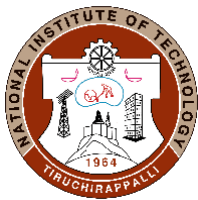
COURSE OVERVIEW

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
1	2 Contact Hours	Development of Algorithms, Notations and analysis, Storage structures for arrays	PPT
2	4 Contact Hours	Sparse matrices, Stacks and Queues: Representations and applications.	PPT
3	4 Contact Hours	Linked Lists - Linked stacks and queues- Operations on polynomials, Doubly linked lists - Circularly linked lists	PPT
4	3 Contact Hours	Dynamic storage management, Garbage collection and compaction	PPT



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5	4 Contact Hours	Binary Trees, Binary search trees, Tree traversal, Expression manipulation, Symbol table construction	PPT
6	4 Contact Hours	Height balanced trees, Red-black trees	PPT
7	3 Contact Hours	Graphs, Representation of graphs - BFS, DFS - Topological sort	PPT
8	4 Contact Hours	Shortest path problems, String representation and manipulations, Pattern matching	PPT
9	3 Contact Hours	Sorting Techniques - Selection, Bubble, Insertion, Merge, Heap, Quick, and Radix sort	PPT
10	3 Contact Hours	Address calculation, Linear search, Binary search, Hash table methods	PPT

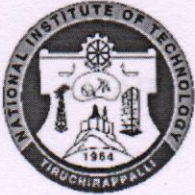
COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	After completion of 2 units	1hr	15
2	Test 2	After completion of next 2 units	1hr	15
3	Test 3	After completion of last unit	1hr	15
3	Programming Assignment with Viva	-	-	25
CPA	Retest	After cyle test 1 & cyle test 2	1hr	15
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.

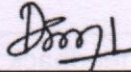
ACADEMIC DISHONESTY & PLAGIARISM

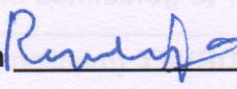
- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental 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.

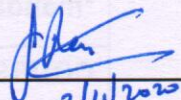
ADDITIONAL INFORMATION, IF ANY

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

FOR APPROVAL

Course Faculty 

CC- Chairperson 

HOD 
2/11/2020



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.