

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Data Structures and Algorithms
2.	Course Number	CS2206
3.	Status of the Course	Core
4.	Structure of Credits	3-1-0-4
5.	Offered To	UG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Computer Science and Engineering
8.	To take effect from	July 2018
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	Course Objective: To learn and implement various data structures and algorithms for computational problem solving; To design data structures and develop efficient algorithms.	
12.	Course Content: Introduction to time complexity and space complexity, big-Oh notation; Searching: linear search, binary search; Sorting: insertion sort, bubble sort, selection sort, merge sort, quick sort and heap sort; Abstract data types; Linear data-structures: stacks, queues, linked list and its variants; Iterators; Binary trees: pre-order, post-order, in-order traversals, prefix, postfix and infix expressions, expression evaluation, recursive problems on trees; Dictionaries: binary search trees, balanced binary search trees, B-trees, B+ trees; Priority queues: min heap, max heap; Writing secure code; Set-disjoint union; Preliminary hashing: open, closed hashing, collision resolving methods; Graphs: breadth-first search, depth-first search traversals, topological sorting, strongly connected components.	
13.	Text book(s): 1. Weiss M A, <i>Data Structures and Algorithm Analysis in C++</i> , 4th Edition, Pearson (2014).	
14.	Reference(s): 1. Aho A V, Hopcroft J E and Ullman J D, <i>Data Structures and Algorithms</i> , Pearson (2001). 2. Sahni S, <i>Data Structures, Algorithms and Applications in C++</i> , 2nd Edition, University Press (2005).	