SWARNANDHRA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)
Narsapur, West Godavari District, A.P. 534280
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
20CS5E04	ADVANCED DATA STRUCTURES	V	CSE	5	2023-24	05-06-24

COURSE OUTCOMES

1	Illustrate several sub-quadratic sorting algorithms. K4
2	Observe and demonstrate various hashing methods. K2
3	Apply advanced data structures such as priority queues K3
4	Organize to show various search trees K4
5	Develop advanced data structures and its applications K3

UNIT	CO	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery method
I	Illustrate several sub-quadratic sorting algorithms. K4	1.1	The String Abstract Data Type-Introduction	T1	1	PPT
		1.2	Introduction-Pattern Matching	T1	1	PPT
		1.3	Brute force, Boyer-More	T1	1	PPT
		1.4	Knuth-Morries - Prath Algorithms.	T1	2	PPT
		1.5	Sorting: Medians and order Static	T1	1	PPT
		1.6	External Sorting	T1	1	PPT
		1.7	Introduction, K-way Merging	T1	1	Active Learning
		1.8	Buffer Handling for parallel Operation	T1	1	PPT
		1.9	Run Generation, Optimal Merging Runs	T1	1	PPT
				Total	10	
II	Observe and demonstrate various hashing methods. K2	2.1	Hashing - Basic Hashing	T1	1	PPT
		2.2	Perfect Hashing –Universal Hashing	T1	1	PPT
		2.3	Static Hashing	T1	1	PPT

		2.4	Hash Table, Hash Functions	T1	1	PPT
		2.5	Secure Hash Function, Overflow Handling	T1	1	PPT
		2.6	Theoretical Evaluation of Overflow Techniques	T1	1	PPT
		2.7	Dynamic Hashing	T1	1	PPT
		2.8	Motivation for Dynamic Hashing	T1	1	PPT
		2.9	Dynamic Hashing Using Directories	T1	2	PPT
		2.10	Directory less Dynamic Hashing,	T1	2	PPT
		2.11	Alternate hash functions	T1	1	PPT
					Total 13	
III	Apply advanced data structures such as priority queues, Heaps. K3	3.1	Priority Queues and Advance Heaps	T1	1	PPT
		3.2	Double Ended Priority queues	T1	2	PPT
		3.3	Leftist Trees: Height Biased, Weight Biased	T1	2	Colloborative Learning
		3.4	Binomial Heaps: Cost Amortization	T1	1	PPT
		3.5	Definition of Binomial Heaps	T1	1	PPT
		3.6	Insertion, Melding two Binomial Heaps	T1	2	PPT
		3.7	Deletion of min element	T1	1	PPT
		3.8	Fibonacci Heaps: Definition	T1	1	PPT
		3.9	Deletion from an F-heap	T1	1	PPT
		3.10	Decrease key,Cascading Cut.	T1	1	PPT
					Total 13	
IV	Organize to show various search trees K4	4.1	Advanced and Efficient Binary Search Trees	T1	1	PPT
		4.2	Optimal Binary Search Trees	T1	1	Quiz
		4.3	AVL Trees- rotations, insertion, deletion operations	T1	2	PPT
		4.4	Red-Black Trees-Definition	T1	1	PPT
		4.5	Red Black Tree Representation	T1	1	PPT
		4.6	Searching, Insertion,	T1	1	PPT
		4.7	Deletion, Joining, Splitting operations	T1	2	PPT
		4.8	M-Way Search Trees, Definition and Properties	T1	1	PPT
		4.9	Searching an M-Way Search Tree	T1	1	PPT

				Total	11	
V	Develop advanced data structures and its applications K3	5.1	Digital Search Structures	T1	1	PPT
		5.2	Digital Search Trees: Definition, Search, Insert and Delete	T1&T2	1	Flipped learning
		5.3	B and B+ Tree - Searching - Insertion - Removal	T1	2	PPT
		5.4	Amortized analysis of B trees - B+ tree	T1&T2	1	BBT
		5.5	Tries-Insertion-Searching-Deletion-Complexity-Compact	T1&T2	2	BBT
		5.6	Compact tree-Patricia-Suffix tree	T1	1	PPT
		5.7	Applications-Block Chains,	T1	1	PPT
		5.8	Digital Signature	T1	1	BBT
		5.9	Data Science, Cloud and IOT	T1	1	PPT
		5.10	Databases - Database Problems	T1	1	PPT
		5.11	B trees in databases and file systems	T1	1	PPT
		Content beyond syllabus	Self-Balancing Trees	T1	1	Flipped learning
				Total	13	
				CUMULATIVE PROPOSED PERIODS	60	

Text Books:

S. No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Suman Saha, Shailendra Shukla, "Advanced Data Structures: Theory and Applications", CRC Press Taylor & Francis 2019.
2	Richard F Gilberg, Behrouz A Forouzan, "Data Structures a Pseudo code Approach with C", 2nd edition Cengage, 2005.
3	Horowitz, Sahani, Anderson-freed, "Fundamentals of Data Structures in C", 2nd edition, Universities Press.2018

Reference Books:

S. No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Mark Allen Weiss, Pearson, Data structures and Algorithm Analysis in C, 2nd edition,Tata McGraw Hill, 2020
2	T. Cormen, R.Rivest, C. Stein, C. Leiserson, Introduction to Algorithms, Second Edition ,PHI publication, 2004.

Web Details

1	Web: http://lcm.csa.iisc.ernet.in/dsa/dsa.html
2	http://utubersity.com/?page_id=878
Video Links	
1	http://freevideolectures.com/Course/2519/C-Programming-and-Data-Structures
2	http://freevideolectures.com/Course/2279/Data-Structures-And-Algorithms
3	https://nptel.ac.in/courses/106/102/106102064

		Name	Signature with Date
i.	Faculty I	G Archana	G.Archana
ii.	Faculty II	B.S. Varaprasd	
iii.	Course Coordinator	G Archana	G.Archana
iv.	Module Coordinator	Mr.K.Rajesh Kumar	
v.	Programme Coordinator	Dr.P.Srinivasulu	

HOD

PRINCIPAL