SHRI VENKATESHWARA UNIVERSITY

Syllabus

M.TECH Part Time

(Computer Science & Engineering)

(Three Years Post Graduation Programme)

(w.e.f. 2019-20)

SCHOOL OF ENGINEERING & TECHNOLOGY

Evaluation for M.Tech (CSE Part time)

SEMESTER-I													
Sl. No.	**Subject Codes**	**Subject**	**Periods**			**Evaluation Scheme**				**End Semester**		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	WCS-100	Advanced Data Structures	3	0	0	20	10	30		70		100	3
2	WCS-012	Wireless Sensor Networks	3	0	0	20	10	30		70		100	3
3	WCS-110	Advanced Data Structures Lab	0	0	4				25		25	50	2
4	AUD-101	English for Research Paper Writing	2	0	0	20	10	30		70		100	0
		Total										250	8

Course Code	WCS-100	
Course Name	Advanced Data Structures	
Credits	3	Total Number of Lectures:48

COURSE OBJECTIVE
The student should be able to choose appropriate data structures, understand the ADT/libraries, and use it to design algorithms for a specific problem.
Students should be able to understand the necessary mathematical abstraction to solve problems.
To familiarize students with advanced paradigms and data structure used to solve algorithmic problems.
Student should be able to come up with analysis of efficiency and proofs of correctness.

LECTURE WITH BREAKUP	**NO. OF LECTURES**
Unit 1 Dictionaries: Definition, Dictionary Abstract Data Type, Implementation of Dictionaries. Hashing: Review of Hashing, Hash Function, Collision Resolution Techniques in Hashing, Separate Chaining, Open Addressing, Linear Probing, Quadratic Probing, Double Hashing, Rehashing, Extendible Hashing.	7
Unit 2 Skip Lists: Need for Randomizing Data Structures and Algorithms, Search and Update Operations on Skip Lists, Probabilistic Analysis of Skip Lists, Deterministic Skip Lists	5
Unit 3 Trees: Binary Search Trees, AVL Trees, Red Black Trees, 2-3 Trees, B-Trees, Splay Trees	9
Unit 4	12
Text Processing: Sting Operations, Brute-Force Pattern Matching, The Boyer-Moore Algorithm, The Knuth-Morris-Pratt Algorithm, Standard Tries, Compressed Tries, Suffix Tries, The Huffman Coding Algorithm, The Longest Common Subsequence Problem (LCS), Applying Dynamic Programming to the LCS Problem.	
Unit 5 Computational Geometry: One Dimensional Range Searching, Two Dimensional Range Searching, Constructing a Priority Search Tree, Searching a Priority Search Tree, Priority Range Trees, Quadtrees, k-D Trees.	10

Unit 6 Recent Trands in Hashing, Trees, and various computational geometry methods for efficiently solving the new evolving problem	5

COURSE OUTCOMES
After completion of course, students would be able to:
Understand the implementation of symbol table using hashing techniques.
Develop and analyze algorithms for red-black trees, B-trees and Splay trees.
Develop algorithms for text processing applications.
Identify suitable data structures and develop algorithms for computational geometry problems.

References:

1. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, 2nd Edition, Pearson, 2004.
2. M T Goodrich, Roberto Tamassia, Algorithm Design, John Wiley, 2002.

Course Code	WCS-012	
Course Name	Wireless Sensor Networks	
Credits	3	Total Number of Lectures: 48

COURSE OBJECTIVE
Architect sensor networks for various application setups.
Devise appropriate data dissemination protocols and model links cost.
Understanding of the fundamental concepts of wireless sensor networks and have a basic knowledge of the various protocols at various layers.

AUDIT : ENGLISH FOR RESEARCH PAPER WRITING

Course objectives:

Students will be able to:

1. Understand that how to improve your writing skills and level of readability
2. Learn about what to write in each section
3. Understand the skills needed when writing a Title

Ensure the good quality of paper at very first-time submission

Syllabus

Units	CONTENTS	Hours
1	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness	4
2	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction	4
3	Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.	4
4	key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature,	4
5	skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions	4
6	useful phrases, how to ensure paper is as good as it could possibly be the first- time submission	4

Suggested Studies:

1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books)

Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press

2. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman'sbook.
3. Adrian Wallwork, English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011

• Evaluate the performance of sensor networks and identify bottlenecks.	
LECTURE WITH BREAKUP	**NO. OF LECTURES**
Unit 1: **Introduction to Wireless Sensor Networks:** Course Information, Introduction to Wireless Sensor Networks: Motivations, Applications, Performance metrics, History and Design factors **Network Architecture:** Traditional layered stack, Cross-layer designs, Sensor Network Architecture **Hardware Platforms:** Motes, Hardware parameters	9
Unit 2: **Introduction to ns-3: I**ntroduction to Network Simulator 3 (ns-3), Description of the ns-3 core module and simulation example.	9
Unit 3: **Medium Access Control Protocol design:** Fixed Access, Random Access, WSN protocols: synchronized, duty-cycled **Introduction to Markov Chain:** Discrete time Markov Chain definition, properties, classification and analysis **MAC Protocol Analysis:** Asynchronous duty-cycled. X-MAC Analysis (Markov Chain)	8
Unit 4: **Security:** Possible attacks, countermeasures, SPINS, Static and dynamic key distribution	8
Unit 5: **Routing protocols:** Introduction, MANET protocols **Routing protocols for WSN:** Resource-aware routing, Data-centric, Geographic Routing, Broadcast, Multicast **Opportunistic Routing Analysis:** Analysis of opportunistic routing (Markov Chain) Advanced topics in wireless sensor networks.	10
Unit 6: **ADVANCED TOPICS** Recent development in WSN standards, software applications.	4

COURSE OUTCOMES
After completion of course, students would be able to:
• Describe and explain radio standards and communication protocols for wireless sensor networks.

Explain the function of the node architecture and use of sensors for various applications.
Be familiar with architectures, functions and performance of wireless sensor networks systems and platforms.

References:

1. W. Dargie and C. Poellabauer, “Fundamentals of Wireless Sensor Networks – Theory and Practice”, Wiley 2010
2. KazemSohraby, Daniel Minoli and TaiebZnati, “wireless sensor networks -Technology, Protocols, and Applications”, Wiley Interscience 2007
3. Takahiro Hara,Vladimir I. Zadorozhny, and Erik Buchmann, “Wireless Sensor Network Technologies for the Information Explosion Era”, springer 2010