COURSE STRUCTURE

AND

DETAILED SYLLABUS

COMPUTER SCIENCE AND ENGINEERING

M.TECH. TWO YEAR DEGREE COURSE

(Applicable for the batches admitted from 2018-19)

VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

Bollikunta, Warangal – 506 005

Telangana State, India

VAAGDEVI COLLEGE OF ENGINEERING
AUTONOMOUS

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
M.Tech (Computer Science and Engineering)

COURSE STRUCTURE
(R18 Regulations applicable for the batches admitted from Academic Year 2018-19 onwards)

I-SEMESTER

S.No	Course Code	Title of the Course	L	T	P	C
1	M18CS01	Data Structures and Algorithms	3	0	0	3
2	M18CS02	Distributed Systems	3	0	0	3
3		**Program Elective-I**				
	M18CS03	Internet of Things	3	0	0	3
	M18CS04	Machine Learning				
	M18CS05	Cloud Computing				
4		**Program Elective-II**				
	M18CS06	Data Science	3	0	0	3
	M18CS07	Advanced Wireless and Mobile Networks				
	M18CS08	Scripting Languages				
5	M18MC01	Research Methodology	2	0	0	2
6	M18AC01	**Audit Course-I** English for Research Paper Writing	2	0	0	0
7	M18CS09	Data Structures and Algorithms Lab	0	0	4	2
8	M18CS10	Cloud Computing Lab	0	0	4	2
		Total Credits	**16**	**0**	**8**	**18**

II-SEMESTER

S.No	Course Code	Course Title	L	T	P	C
1	M18CS11	Network Programming	3	0	0	3
2	M18CS12	Soft Computing Techniques	3	0	0	3
3		**Program Elective-III**				
	M18CS13	Computer Vision	3	0	0	3
	M18CS14	Data Preparation and Analysis				
	M18CS15	Digital Forensics				
4		**Program Elective-IV**				
	M18CS16	Distributed Databases	3	0	0	3
	M18CS17	Human Computer Interaction				
	M18CS18	Software Process and Project Management				
5	M18AC02	**Audit Course-II** Stress Management	2	0	0	0
6	M18CS19	Network Programming Lab	0	0	4	2
7	M18CS20	Digital Forensics Lab	0	0	4	2
8	M18CS21	Mini Project	0	0	2	2
		Total Credits	**14**	**0**	**10**	**18**

III-SEMESTER

S.No	Course Code	Title of the Course	L	T	P	C
1		**Program Elective-V**				
	M18CS22	Semantic Web & Social Networks	3	0	0	3
	M18CS23	Mobile Application and Security				
	M18CS24	Compiler for HPC				
2		**Open Elective**				
	M18MA01	Advanced Optimization Techniques	3	0	0	3
	M18SE27	Waste Management				
	M18VL07	Embedded System Design				
3	M18CS25	Dissertation Phase-I	0	0	20	10
		Total Credits	**6**	**0**	**20**	**16**

IV-SEMESTER

S.No	Course Code	Title of the Course	L	T	P	C
1	M18CS26	Dissertation Phase-II	0	0	32	16
		Total Credits	**0**	**0**	**32**	**16**
		Grand Total				**68**

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS01) DATA STRUCTURES AND ALGORITHMS
(CORE COURSE – I)

M.Tech:I-Semester **L/T/P C**
3/0/- 3

Objectives:

The fundamental design, analysis, and implementation of basic data structures. Basic concepts in the specification and analysis of programs. Principles for good program design, especially the uses of data abstraction. Significance of algorithms in the computer field Various aspects of algorithm development Qualities of a good solution

UNIT-I

Algorithms, Performance analysis- time complexity and space complexity, Asymptotic Notation-Big Oh, Omega and Theta notations, Complexity Analysis Examples. Data structures-Linear and non linear data structures, ADT concept, Linear List ADT, Array representation, Linked representation, Vector representation, singly linked lists -insertion, deletion, search operations, doubly linked lists-insertion, deletion operations, circular lists. Representation of single, two dimensional arrays, Sparse matrices and their representation.

UNIT-II

Stack and Queue ADTs, array and linked list representations, infix to postfix conversion using stack, implementation of recursion, Circular queue-insertion and deletion, Dequeue ADT, array and linked list representations, Priority queue ADT, implementation using Heaps, Insertion into a Max Heap, Deletion from a Max Heap, java.util package-ArrayList, Linked List, Vector classes, Stacks and Queues in java.util, Iterators in java.util.

UNIT-III

Searching–Linear and binary search methods, Hashing-Hash functions, Collision Resolution methods-Open Addressing, Chaining, Hashing in java.util-HashMap, HashSet, Hashtable. Sorting – Bubble sort, Insertion sort, Quick sort, Merge sort, Heap sort, Radix sort, comparison of sorting methods.

UNIT-IV

Trees- Ordinary and Binary trees terminology, Properties of Binary trees, Binary tree ADT, representations, recursive and non recursive traversals, Java code for traversals, Threaded binary trees. Graphs- Graphs terminology, Graph ADT, representations, graph traversals/search methods DFS and DFS, Java code for graph traversals, Applications of Graphs-Minimum cost spanning tree using Kruskal's algorithm, Dijkstra's algorithm for Single Source Shortest Path
Problem.

UNIT-V

Search trees- Binary search tree-Binary search tree ADT, insertion, deletion and searching operations, Balanced search trees, AVL trees-Definition and examples only, Red Black trees –Definition and examples only, B-Trees-definition, insertion and searching operations, Trees in java.util- TreeSet, Tree Map Classes, Tries(examples only),Comparison of Search trees. Text compression-Huffman coding and decoding, Pattern matching-KMP algorithm.

Course Outcomes:

After the completion of this course the students should be able to

1. Define knowledge basic on data structures to store and retrieve an ordered or unordered data. Such as, arrays, linked lists, trees, heaps, and hash tables.
2. Develop knowledge on applications of data structures having the ability to implement algorithms to perform operation as create, insert, delete, search, and sorting.
3. Learn to analyze and to compare efficiency of an algorithm.
4. Understand the basic concepts of latest techniques.
5. Ability to have concepts on tree and graphs.
6. Implement various projects on these data structures and plan B-Trees to implement different various operations.

TEXT BOOKS:

1. Data structures, Algorithms and Applications in Java, S.Sahni, Universities Press.
2. Data structures and Algorithms in Java, Adam Drozdek, 3rd edition, Cengage Learning.
3. Data structures and Algorithm Analysis in Java, M.A.Weiss, 2nd edition, Addison-Wesley (Pearson Education).

REFERENCE BOOKS:

1. Java for Programmers, Deitel and Deitel, Pearson education.
2. Data structures and Algorithms in Java, R.Lafore, Pearson education.
3. Java: The Complete Reference, 8th editon, Herbert Schildt, TMH.
4. Data structures and Algorithms in Java, M.T.Goodrich, R.Tomassia, 3rd edition,Wiley India Edition.
5. Data structures and the Java Collection Frame work,W.J.Collins, Mc Graw Hill.
6. Classic Data structures in Java, T.Budd, Addison-Wesley (Pearson Education).
7. Data structures with Java, Ford and Topp, Pearson Education.
8. Data structures using Java, D.S.Malik and P.S.Nair, Cengage learning.
9. Data structures with Java, J.R.Hubbard and A.Huray, PHI Pvt. Ltd.
10. Data structures and Software Development in an Object-Oriented Domain, J.P.Tremblay and G.A.Cheston, Java edition, Pearson Education.

*****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS02) Distributed Systems
(CORE COURSE – II)

M.Tech:I-Semester **L/T/P C**
3/0/- 3

Objectives:

- Understand the need for distributed systems and their applications.
- Understand the concepts of remote procedure calls, remote file systems, distributed agreement, clock synchronization, and security.

UNIT-I

Characterization of Distributed Systems : Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges. System Models , Introduction, Architectural Models, Fundamental Models

UNIT-II

Time and Global States: Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging.

Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication, Consensus and Related Problems.

UNIT-III

InterProcess Communication : Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT-IV

Distributed File Systems : Introduction, File Service Architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew File System.**Name Services :** Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

UNIT- V

Transactions and Concurrency Control : Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control. **Distributed Transactions :** Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery

Course Outcomes:

After the completion of this course the students should be able to

1. Explain distributed system design and its properties.
2. List the principles underlined along with its functionality.
3. Implement problems and challenges with these principles.
4. Identify the effectiveness and shortcomings for solutions.
5. Identify the principles that are based on these contemporary distributed systems.
6. Explain its affect on software design to identify the features.

TEXT BOOKS:

1.Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education.
2. Distributed Systems, S.Ghosh, Chapman & Hall/CRC, Taylor & Francis Group, 2010.

REFERENCE BOOKS:

1. Distributed Computing, S.Mahajan and S.Shah, Oxford University Press.
2. Distributed Operating Systems Concepts and Design, Pradeep K.Sinha, PHI.
3. Advanced Concepts in Operating Systems, M Singhal, N G Shivarathri, TMH.
4. Reliable Distributed Systems, K.P.Birman, Springer.
5. Distributed Systems – Principles and Paradigms, A.S. Tanenbaum and M.V. Steen, Pearson Education.
6. Distributed Operating Systems and Algorithm Analysis, R.Chow, T.Johnson, Pearson.
7. Distributed Operating Systems, A.S.Tanenbaum, Pearson education.
8. Distributed Computing, Principles, Algorithms and Systems, Ajay D.Kshemakalyaniand Mukesh Singhal, Cambridge, 2010.

*****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS03) Internet Of Things (IoT)
(PROGRAM ELECTIVE-I)

M.Tech:I-Semester **L/T/P C**
3/0/- 3

Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web based services on IoT devices

UNIT-I:

Introduction to Internet of Things –Definition and Characteristics of IoT , Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs, IoT enabaled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates, Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

UNIT-II:

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT, Basics of IoT System Management with NETCOZF, YANG- ETCONF, YANG, SNMP NETOPEER

UNIT-III:

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML , HTTPLib , URLLib , SMTPLib .

UNIT-IV:

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT V

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Web server – Web server for IoT, Cloud for IoT, Python web application framework Designing a REST ful web API

Course Outcomes:

After the completion of this course the students should be able to :

1. Describe the basic terminology, latest technology along with its applications.
2. Discuss the protocols based on the concepts such as machine to machine.
3. Illustrate the IOT devices using Python Scripting Language.
4. Develop an application with Raspberry PI platform which can be widely used in many applications of IoT devices.
5. Implement it widely that can be used in many applications of IoT devices.
6. Design a web application framework on REST ful web API.

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti,Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

REFERENCE BOOKS:

1. Machine Learning Methods in the Environmental Sciences, Neural Networks, William W Hsieh, Cambridge Univ Press.
2. Richardo. Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley &Sons Inc., 2001.
3. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995.
4. Machine Learning by Peter Flach , Cambridge.

*****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(MS18CS04) MACHINE LEARNING
(PROGRAM ELECTIVE-I)

M.Tech: I-Semester **L/T/P C**
3/0/- 3

Objectives:

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.
- To be able to apply machine learning algorithms to solve problems of moderate complexity.
- To be able to read current research papers and understands the issues raised by current research.

UNIT-I:

The ingredients of machine learning, Tasks: the problems that can be solved with machine learning, Models: the output of machine learning, Features, the workhorses of machine learning. Binary classification and related tasks: Classification, Scoring and ranking, Class probability estimation

UNIT- II:

Beyond binary classification: Handling more than two classes, Regression, Unsupervised and descriptive learning. Concept learning: The hypothesis space, Paths through the hypothesis space, Beyond conjunctive concepts

UNIT-III:

models: Decision trees, Ranking and probability estimation trees, Tree learning as variance reduction. Rule models: Learning ordered rule lists, Learning unordered rule sets, Descriptive rule learning, First-order rule learning

UNIT-IV:

Linear models: The least-squares method, The perceptron: a heuristic learning algorithm for linear classifiers, Support vector machines, obtaining probabilities from linear classifiers, Going beyond linearity with kernel methods. Distance Based Models: Introduction, Neighbours and exemplars, Nearest Neighbours classification, Distance Based Clustering, Hierarchical Clustering.

UNIT- V:

Probabilistic models: The normal distribution and its geometric interpretations, Probabilistic models for categorical data, Discriminative learning by optimising conditional likelihood Probabilistic models with hidden variables. Features: Kinds of feature, Feature transformations, Feature construction and selection. Model ensembles: Bagging and random forests, Boosting

Course Outcomes:

After the completion of this course the students should be able to :

1. Discuss different application on Machine Learning problems.
2. Describe various algorithms on Machine Learning mentioning its strengths and weaknesses.
3. Illustrate the basic theory focused on Machine Learning.
4. Improve the performance of Machine Learning algorithms with different parameters.
5. Analyze current research papers.

6. Understand the latest issues raised by current researchers.

TEXT BOOKS:

1. Machine Learning: The art and science of algorithms that make sense of data, Peter Flach, Cambridge.
2. Machine Learning, Tom M. Mitchell, MGH.

REFERENCE BOOKS:

1. Understanding Machine Learning: From Theory to Algorithms, Shai Shalev-Shwartz, Shai Ben-David, Cambridge.
2. Machine Learning in Action, Peter Harington, 2012, Cengage.

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS05) CLOUD COMPUTING
(PROGRAM ELECTIVE-I)

M.Tech: I-Semester **L/T/P C**
3/0/- 3

Objectives:

- To learn the new computing model this enables shared resources on demand over the network.
- To learn about the pay-per-use scenarios.
- To learn about the new kind of service models and deployment models.
- To learn about the virtualization technology.
- To learn the python programming or various services and models.
- To develop cloud applications in Python

UNIT-I

Principles of Parallel and Distributed Computing, Introduction to cloud computing, Cloud computing Architecture, cloud concepts and technologies, cloud services and platforms, Cloud models, cloud as a service, cloud solutions, cloud offerings, introduction to Hadoop and Map reduce.

UNIT-II

Cloud Platforms for Industry, Healthcare and education, Cloud Platforms in the Industry, cloud applications. Virtualization, cloud virtualization technology, deep dive: cloud virtualization, Migrating in to cloud computing, Virtual Machines Provisioning and Virtual Machine Migration Services, On the Management of Virtual Machines for cloud Infrastructure, Comet cloud, T-Systems,

UNIT-III

Cloud computing Applications: Industry, Health, Education, Scientific Applications, Business and Consumer Applications, Understanding Scientific Applications for Cloud Environments, Impact of Cloud computing on the role of corporate IT. Enterprise cloud computing Paradigm, Federated cloud computing Architecture, SLA Management in Cloud Computing, Developing the cloud: cloud application Design.

UNIT-IV

Python Basics, Python for cloud, cloud application development in python, Cloud Application Development in Python. Programming Google App Engine with Python: A first real cloud Application, Managing Data in the cloud, Google app engine Services for Login Authentication, Optimizing UI and Logic, Making the UI Pretty: Templates and CSS, Getting Interactive. Map Reduce Programming Model and Implementations.

UNIT-V

Cloud management, Organizational Readiness and change management in the cloud age ,Cloud Security, Data security in the cloud, Legal Issues in the Cloud , Achieving Production Readiness for the cloud Services

Course Outcomes:

After the completion of this course the students should be able to :

1. Discuss main concepts, key strengths, and limitations for cloud computing.

2. Develop the architecture along with specific infrastructure on cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
3. Explain the issues on cloud computing along with security, privacy, and interoperability.
4. Choose and use the appropriate technology, methods on these issues.
5. Identify problems, and explain, analyze, and evaluate various cloud computing solutions.
6. Provide the appropriate solutions on cloud computing based on the application.

TEXT BOOKS:

1. Cloud Computing: Raj Kumar Buyya , James Broberg, andrzej Goscinski, 2013 Wiley
2. Mastering Cloud Computing: Raj Kumar buyya, Christian Vecchiola,selvi-2013.
3. Cloud Computing: Arshdeep Bahga, Vijay Madisetti, 2014, University Press.
4. Cloud computing: Dr Kumar Saurab Wiley India 2011.

REFERENCES:

1. Code in the Cloud: Mark C.Chu-Carroll 2011, SPD.(Second part of IV UNIT)
2. Essentials of cloud computing : K Chandrasekharan CRC Press.
3. Cloud Computing: John W. Rittinghouse, James Ransome, CRC Press.
4. Virtualization Security: Dave shackleford 2013. SYBEX a wiley Brand.
5. Cloud computing and Software Services: Ahson , Ilyas.2011.
6. Cloud Computing Bible: Sosinsky 2012. Wiley India .
7. Cloud Computing: Dan C. Marinescu-2013, Morgan Kaufmann.
8. Distributed and Cloud Computing, Kai Hwang, Geoffery C.Fox, Jack J.Dongarra, Elsevier, 2012.
9. Fundamentals of Python Kenneth A.Lambert, B.L.Juneja

*****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS06) DATA SCIENCE
(PROGRAM ELECTIVE-II)

M.Tech:I-Semester **L/T/P C**
3/0/- 3

Course Objectives :
Modern scientific, engineering, and business applications are increasingly dependent on data, existing traditional data analysis technologies were not designed for the complexity of the modern world. Data Science has emerged as a new, exciting, and fast-paced discipline that explores novel statistical, algorithmic, and implementation challenges that emerge in processing, storing, and extracting knowledge from Big Data.

UNIT-I:
INTRODUCTION TO DATA SCIENCE: Data science process – roles, stages in data science project – working with data from files – working with relational databases – exploring data – managing data – cleaning and sampling for modeling and validation – introduction to NoSQL.

UNIT-II:
MODELING METHODS: Choosing and evaluating models – mapping problems to machine learning, evaluating clustering models, validating models – cluster analysis – K-means algorithm, Naïve Bayes – Memorization Methods – Linear and logistic regression – unsupervised methods.

UNIT-III:
INTRODUCTION TO R: Reading and getting data into R – ordered and unordered factors – arrays and matrices – lists and data frames – reading data from files – probability distributions – statistical models in R - manipulating objects – data distribution.

UNIT-IV:
MAP REDUCE: Introduction – distributed file system – algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce – Hadoop - Understanding the Map Reduce architecture - Writing HadoopMapReduce Programs - Loading data into HDFS - Executing the Map phase - Shuffling and sorting - Reducing phase execution.

UNIT-V:
DELIVERING RESULTS: Documentation and deployment – producing effective presentations – Introduction to graphical analysis – plot() function – displaying multivariate data – matrix plots – multiple plots in one window - exporting graph - using graphics parameters. Case studies.

Course Outcomes:

After the completion of this course the students should be able to :

1. Describe a Data Science, skill sets available for a data scientist.
2. Discuss the terms Statistical Inference, its significance to explore data analysis.
3. Understand Data Science Process and its components interact.
4. Adapt APIs tools to understand the Web data.
5. Illustrate EDA and the Data Science as a case study.
6. Plan a effective visualization on given data.

REFERENCES

1. Nina Zumel, John Mount, “Practical Data Science with R”, Manning Publications, 2014.
2. Jure Leskovec, AnandRajaraman, Jeffrey D. Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2014.
3. Mark Gardener, “Beginning R - The Statistical Programming Language”, John Wiley & Sons, Inc., 2012.4. W. N. Venables, D. M. Smith and the R Core Team, “An Introduction to R”, 2013.
4. Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, AbhijitDasgupta, “Practical Data Science Cookbook”, Packt Publishing Ltd., 2014.
5. Nathan Yau, “Visualize This: The FlowingData Guide to Design, Visualization, and Statistics”, Wiley, 2011.
6. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015.
7. http://www.johndcook.com/R_language_for_programmers.html
8. http://bigdatauniversity.com
9. http://home.ubalt.edu/ntsbarsh/stat-data/topics.htm#rintroduction

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS07) Advanced Wireless and Mobile Networks
(PROGRAM ELECTIVE-II)

M.Tech:I-Semester **L/T/P C**
3/0/- 3

Course Objectives

- To make students familiar with fundamentals of mobile communication systems.
- To identify the limitations of 2G and 2.5G wireless mobile communication and the design of 3G and beyond mobile communication systems.
- To understand the fading and shadowing concept in wireless communication system.
- To understand the multicarrier and multi-antenna advantages in wireless communication.
- To become familiar with the diversity and equalization concepts in wireless channel.

UNIT-I:
Basic communication Technologies, Introduction to Mobile Networks, Introduction to different categories of Wireless networks (MANET: Mobile ad-hoc networks- Communication Architectures of a typical MANET, Applications of MANET, WSN: **Wireless Sensor Networks** - topologies in WSN-Linear, Grid and Cluster based topologies, communication architectures in a WSN, applications of WSNs, VANET: Vehicular Ad-hoc Networks- communication architectures in VANET, Applications of VANET, PAN: Personal Area Networks- the Bluetooth technology, the bluetooth specifications, DTN: Delay Tolerant Network-delay tolerant network architecture, applications of DTN), Wireless Communication Fundamentals, Cellular Wireless Networks.

UNIT-II:
Medium Access Control Layer- Hidden terminal problem, Exposed terminal problem, Collision avoidance, Congestion Avoidance, Congestion control, Energy Efficiency, MACA and MACAW protocols, Wireless LAN and IEEE 802.11- Network architecture, the physical layer, the MAC layer, security.

UNIT-III:
Network layer -functionalities in multi-hop wireless networks- Mobile Ad-hoc Networks broadcasting in a MANET, Flooding generated broadcast storm problem, rebroadcasting schemes, Issues in providing multicasting in MANET, Multicast routing protocols, Geocasting Geocast routing protocols.

UNIT-IV:
Mobile Network Layer (Mobile IP), DHCP (Dynamic host configuration protocol), Routing in Mobile Ad hoc Networks (MANET)- Topology-based versus position based approaches, Proactive routing protocols, Reactive routing protocols, Hybrid routing protocols, position based routing issues and forwarding strategies, AODV (Ad-hoc On-Demand Distance Vector Routing Protocol)-Analysis of AODV under mobility and Faults in a network, DSR (Dynamic Source Routing)-Analysis of DSR under mobility and Faults in a network, Secure routing protocols in MANET.

UNIT-V:
Wireless Sensor Networks: (Routing protocols, Localization methods, Sensor Deployment Strategies), traffic flow pattern in WSN- one to many, many to one and many to many, Routing protocols for Delay Tolerant Networks, Routing protocols for Vehicular Ad-hoc Networks,

Wireless Access Protocol, GPS (Global positioning system) and applications, RFID and its applications.

Course Outcomes:

After the completion of this course the students should be able to :

1. Discuss the state-of-the-art in network protocols, architectures and applications.
2. Analyze existing network protocols and networks.
3. Develop new protocols on networking
4. Describe novel ideas in the area of Networking via term-long research projects.
5. Implement various protocols on localization Methods.
6. Design a real time applications on RFID.

Text Books:

1. C D M Cordeiro, D. P. Agarwal, Adhoc and Sensor Networks: Theory and applications, World Scientific, 2006.
2. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education, 2003.
3. Asoke K Talukder and Roopa R. Yavagal, Mobile Computing – Technology, Applications and Service Creation; TMH Pub., New Delhi, 2006

Reference Books

1. T. S. Rappaport: Wireless Communications, PHI, 2002.
2. Jochen Schiller : Mobile Communication , Pearson.
3. Raymond Steel : GSM, cdma one and cdma 2000, Wiley.
4. Andrea Goldsmith : Wireless Communications , Cambridge University Press.
5. Jochim Tisal : GSM Network: GPRS evolution one step towards UMTS , John Wiley & Sons.
6. David Tse & Pramod Viswanath: Fundamentals of Wireless Communication , Cambridge University Press.
7. Ezio Biglieri : MIMO Wireless Communications, Cambridge University Press.
8. Martin Sauter: Beyond 3G Bringing Networks, Terminals and the Web Together , John Wiley & Sons.
9. Savo G. Glisic: Advanced Wireless Communications, John Wiley & Sons

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS08) Scripting Languages
(PROGRAM ELECTIVE-II)

M.Tech:I-Semester **L/T/P C**
3 0 0 3

Course Objective

- This course provides an introduction to the script programming paradigm
- Introduces scripting languages such as Perl, PHP and Python.
- Learning TCL

UNIT-I:

Introduction to PERL and Scripting Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

UNIT-II:

Advanced perl Finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Isses.

UNIT-III:

PHP Basics PHP Basics- Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures. Function, Creating a Function, Function Libraries, Arrays, Strings and Regular Expressions. PHP and Web Forms, Files, PHP Authentication and Methodolgies -Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Websites for the World.

UNIT-IV:

TCL TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures , strings , patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C
Interface Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding, Perl-Tk.

UNIT-V:

Python Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling. Integrated Web Applications in Python – Building Small, Efficient Python Web Systems ,Web Application Framework.

Course Outcomes:

After the completion of this course the students should be able to :

1. Explain scripting as well as contributions on scripting languages.
2. Discuss Python on regard as the object-oriented concepts,
3. Design the different built-in objects of Python,
4. Discuss advanced applications such as TCP/IP network programming, multithreaded programming, Web applications, discrete-event simulations, etc.

5. Develop different modules on exception handling applications.
6. Plan a Real Time Web systems.

TEXT BOOKS:

1. The World of Scripting Languages , David Barron,Wiley Publications.
2. Beginning PHP and MySQL , 3rd Edition , Jason Gilmore,Apress Publications (Dream tech.).
3. Python Web Programming, Steve Holden and David Beazley ,New Riders Publications.

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux Apache,MySQL,Perl and PHP,J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python,M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development ,Julie Meloni and Matt Telles, Cengage Learning Publications.
4. PHP 5.1,I.Bayross and S.Shah,The X Team,SPD.
5. Core Python Programming,Chun,Pearson Education.
6. Guide to Programming with Python,M.Dawson,Cengage Learning.
7. Perl by Example,E.Quigley,Pearson Education.
8. Programming Perl,Larry Wall,T.Christiansen and J.Orwant, O'Reilly, SPD.
9. Tcl and the Tk Tool kit,Ousterhout,Pearson Education.
10. PHP and MySQL by Example,E.Quigley,Prentice Hall(Pearson).
11. Perl Power,J.P.Flynt,Cengage Learning.
12. PHP Programming solutions,V.Vaswani,TMH.

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18MC01) RESEARCH METHODOLOGY
(Audit Course-I)

M.Tech:I Semester **L/T/P C**
2 0 0 2

Prerequisites: English

Course Objectives:

- To develop an understanding of IPR/ research methodology in the process of creation of patents through research.
- To develop further research capabilities.
- To learn better report writing skills and Patenting.

UNIT I:

RESEARCH METHODOLOGY: Objectives and Motivation of Research, Significance of Literature review, Types of Research, Research Approaches, and Research Methods verses Methodology, Research and Scientific Method, Importance of Research Methodology, Research Process, Criteria of Good Research.

UNIT II:

RESEARCH DESIGN: Meaning of Research Design, Need of Research Design, Feature of a Good Design Important Concepts Related to Research Design, Different Research Designs, Basic Principles of Experimental Design, Data collection methods, Collection of primary data, Secondary data, Data organization, Methods of data grouping, Diagrammatic representation of data, Graphic representation of data.

UNIT III:

RESEARCH REPORT WRITING: Format of the Research report, Synopsis, Dissertation, References/Bibliography/ Webliography, Research Proposal Preparation: Writing a Research Proposal and Research Report, Writing Research Grant Proposal.

UNITIV:

NATURE OF INTELLECTUAL PROPERTY: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development.

UNIT V:

PATENT RIGHTS: Scope of Patent Rights. Licensing and transfer of technology. Patentinformation and databases. New Developments in IPR: Administration of Patent System.

Course Outcomes:

After the completion of this course the students should be able to :

1. Acquire knowledge on Research Design and statistical methods in research.
2. Analyze the various methods in Data Collection, Data Organization and different approaches of Data Representation.
3. Understand all the basic concepts required to prepare
    a. Research synopsis
    b. Dissertation
    c. Writing a good research proposal
4. Interpret the Scope of Patent Rights and Administration of Patent System.

TEXT BOOKS:

1. C.R Kothari, "Research Methodology, Methods & Technique".New Age International Publishers, 2004.
2. R. Ganesan, "Research Methodology for Engineers", MJP Publishers, 2011.
3. Robert P. Merges, Peter S. Menell, Mark A. Lemley, "Intellectual Property in New Technological Age", Aspen Publishers, 2016.
4. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008.
5. Satarkar, S.V,."Intellectual property rights and copy right". ESS Publications, 2000.

REFERENCES:

1. Ranjit Kumar, "Research Methodology: A Step by Step Guide for beginners", SAGE Publications Ltd.
2. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2007

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18AC01) ENGLISH FOR RESEARCH PAPER WRITING
(Audit Course-II)

M.Tech:I-Semester **L/T/P C**
2 0 0 2

Course Objectives:

- To understand the nuances of language and vocabulary in writing a Research Paper.
- To develop the content, structure and format of writing a research paper.
- To give the practice of writinga Research Paper.
- To enable the students to evolve original research papers without subjected to plagiarism.

UNIT I:
ACADEMIC WRITING: What is Research? - Meaning & Definition of a research paper– Purpose of a research paper – Scope – Benefits – Limitations – outcomes.

UNIT II:
RESEARCH FORMAT: Title – Abstract – Introduction – Discussion - Findings – Conclusion – Style of Indentation – Font size/Font types – Indexing – Citation of sources.

UNIT III:
RESEARCH METHODOLOGY: Methods (Qualitative – Quantitative) – Literature Review – Who did what – Criticizing, Paraphrasing & Plagiarism.

UNIT IV:
PROCESS OF WRITING A RESEARCH PAPER: Choosing a topic - Thesis Statement – Outline – Organizing notes - Language of Research – Word order, Paragraphs – Writing first draft –Revising/Editing - Typing the final draft

UNIT V:
HOW TO & WHERE TO GET PUBLISHED: Reputed Journals – National/International – ISSN No, No. of volumes, Scopes Index/UGC Journals – Free publications - Paid Journal publications – /Advantages/Benefits

Course Outcomes:

After the completion of this course the students should be able to :

1. Obtain complete knowledge on Definition of a research paper, Purpose of writing any research paper , its Scope and Benefits.
2. Understand the standard English formats .for scripting the best research paper.
3. Analyze all the Qualitative and Quantitative Research Methodologies and the ethics of plagiarism.
4. Explain the detailed process of writing and publishing any research paper and perform a case study on paper writing.

TEXT BOOKS:

1. MLA Hand book for writers of Research Papers, East West Press Pvt. Ltd, New Delhi, 7th Edition.
2. C. R Kothari, Gaurav, Garg, Research Methodology Methods and Techniques, New Age International Publishers. 4th Edition.

3. Lauri Rozakis, Schaum's Quick Guide to Writing Great Research Papers, Tata McGraw Hills Pvt. Ltd, New Delhi.
4. N. Gurumani, Scientific Thesis Writing and Paper Presentation, MJP Publishers

REFERENCES:

1. NPTEL: https://onlinecourses.nptel.ac.in/noc18_mg13/preview

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS09) DATA STRUCTURES AND ALGORITHMS LAB
(Laboratory – I)

M.Tech:I-Semester **L/T/P C**
0/0/4 2

Objectives:
The fundamental design, analysis, and implementation of basic data structures. Basic concepts in the specification and analysis of programs. Principles for good program design, especially the uses of data abstraction.

Sample Problems on Data structures:

Week-1:
Write Java programs that use both recursive and non-recursive functions for implementing the following searching methods:
a) Linear search b) Binary search

Week-2:
Write Java programs to implement the following using arrays and linked lists List ADT

Week-3:
Write Java programs to implement the following using an array.
a) Stack ADT b) Queue ADT

Week-4:
Write a Java program that reads an infix expression and converts the expression to postfix form. (Use stack ADT).

Weak-5:
Write a Java program to implement circular queue ADT using an array.

Week-6:
Write a Java program that uses both a stack and a queue to test whether the given string is a palindrome or not.

Week-7:
Write Java programs to implement the following using a singly linked list.
a) Stack ADT b) Queue ADT

Week-8:
Write Java programs to implement the deque (double ended queue) ADT using
a) Array b) Singly linked list c) Doubly linked list.

Week 9:
Write a Java program to implement priority queue ADT.

Week-10:
Write a Java program to perform the following operations:
a) Construct a binary search tree of elements.
b) Search for a key element in the above binary search tree.
c) Delete an element from the above binary search tree.

Week-11:
Write a Java program to implement all the functions of a dictionary (ADT) using Hashing.

Week-12:
Write a Java program to implement Dijkstra's algorithm for Single source shortestpath problem.

Week-13:
Write Java programs that use recursive and non-recursive functions to traverse the given binary tree in

a) Preorder b) Inorder c) Postorder.

Week-14:
Write Java programs for the implementation of BFS and DFS for a given graph.

Week-15:
Write Java programs for implementing the following sorting methods:

a) Bubble sort d) Merge sort g) Binary tree sort
b) Insertion sort e) Heap sort
c) Quick sort f) Radix sort

Week-16:
Write a Java program to perform the following operations:

a) Insertion into a B tree b) Searching in a B-tree

Week-17:
Write a Java program that implements Kruskal's algorithm to generate minimum cost spanning tree.

Week-18:
Write a Java program that implements KMP algorithm for pattern matching.

Course Outcomes:

After the completion of this course the students should be able to :

1. Analyze algorithms effeciency.
2. Summarize and implement various searching and sorting techniques.
3. Demonstrate stack, queue and linked list with various operations.
4. Implement different trees and graphs concepts.

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS10) Cloud Computing Lab
(Laboratory – II)

M.Tech:I-Semester **L/T/P C**
0/4/- 2

Experiments:

Week 1: Introduction to basic cloud computing concepts.

Week 2: Draw a neat diagram of cloud computing Architecture.

Week 3:
Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time.

Week 4:
Find procedure to attach virtual block to the virtual machine and check whether it holds the data even after the release of the virtual machine.

Week 5: Install a C compiler in the virtual machine and execute a sample program.

Week 6: Show the virtual machine migration based on the certain condition from one node to the other.

Week 7: Find procedure to install storage controller and interact with it.

Week 8: Installation and Configuration of Hadoop.

Week 9: Find procedure to set up the one node Hadoop cluster.

Week 10: Mount the one node Hadoop cluster using FUSE.

Week 11: Write a program to use the API's of Hadoop to interact with it.

Week 12: Using Hadoop for counting word frequency with map reduce.

Week 13: Write a word count program to demonstrate the use of Map and Reduce tasks

Week 14: Installation & Configuration of Oracle Virtual box for windows xp & android.

Week 15: Installing open Solaris as a guest OS to Sun xVM Virtual Box using the 7-Zip archive tool

Week 16: Evaluation of performance of services over cloud: Google App &Amazon web services.

Course Outcomes:

After the completion of this course the students should be able to :

1. Develop the architecture along with specific infrastructure on cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
2. Explain the issues on cloud computing along with security, privacy, and interoperability.
3. Identify problems, and explain, analyze, and evaluate various cloud computing solutions.
4. Provide the appropriate solutions on cloud computing based on the application.

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS11) NETWORK PROGRAMMING
(CORE COURSE– III)

M.Tech: II-Semester **L/T/P C**
3/0/- 3

Objectives:
- To understand Linux utilities
- To understand file handling, signals
- To understand IPC, network programming in Java
- To understand processes to communicate with each other across a Computer Network.

UNIT – I Linux Utilities- File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking utilities, Filters, Text processing utilities and Backup utilities. Bourne again shell(bash) - Introduction, pipes and redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples.Review of C programming concepts-arrays, strings (library functions), pointers, function pointers, structures, unions, libraries in C.

UNIT - II Files- File Concept, File types File System Structure, Inodes, File Attributes, file I/O in C using system calls, kernel support for files, file status information-stat family, file and record lockinglockf and fcntl functions, file permissions- chmod, fchmod, file ownership-chown, lchown , fchown, links-soft links and hard links – symlink, link, unlink. File and Directory management – Directory contents, Scanning Directories- Directory file APIs. Process- Process concept, Kernel support for process, process attributes, process control – process creation, replacing a process image, waiting for a process, process termination, zombie process, orphan process.

UNIT – III Signals- Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.Interprocess Communication - Introduction to IPC mechanisms, Pipes- creation, IPC between related processes using unnamed pipes, FIFOs-creation, IPC between unrelated processes using FIFOs(Named pipes), differences between unnamed and named pipes, popen and pclose library functions, Introduction to message queues, semaphores and shared memory.Message Queues- Kernel support for messages, UNIX system V APIs for messages, client/server example.Semaphores-Kernel support for semaphores, UNIX system V APIs for semaphores.

UNIT – IV Shared Memory- Kernel support for shared memory, UNIX system V APIs for shared memory, client/server example.Network IPC - Introduction to Unix Sockets, IPC over a network, ClientServer model ,Address formats(Unix domain and Internet domain), Socket system calls for Connection Oriented - Communication, Socket system calls for Connectionless-Communication, Example-Client/Server Programs- Single Server-Client connection, Multiple simultaneous clients, Socket options – setsockopt, getsockopt, fcntl.

UNIT-V Network Programming in Java-Network basics, TCP sockets, UDP sockets (datagram sockets), Server programs that can handle one connection at a time and multiple connections (using multithreaded server), Remote Method Invocation (Java RMI)-Basic RMI Process, Implementation details-Client-Server Application.

Course Outcomes:
After the completion of this course the students should be able to :
1. Determine Linux utilities.

2. Identify file handling techniques and signals.
3. Explain what is IPC and network programming in Java.
4. Learn how processes communicate with each other across a Computer Network.
5. Develop Network programming using TCP/UDP sockets.
6. Implement Real Time and current trends in client server Application.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI.(Units II,III,IV)
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.(Unit I)
3. An Introduction to Network Programming with Java, Jan Graba, Springer, 2010.(Unit V)
4. Unix Network Programming ,W.R. Stevens, PHI.(Units II,III,IV)
5. Java Network Programming,3rd edition, E.R. Harold, SPD, O'Reilly.(Unit V)

REFERENCES:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. UNIX for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.
4. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones, Wrox, Wiley India Edition.
5. Unix Network Programming The Sockets Networking API, Vol.-I,W.R.Stevens, Bill Fenner, A.M.Rudoff, Pearson Education.
6. Unix Internals, U.Vahalia, Pearson Education.
7. Unix shell Programming, S.G.Kochan and P.Wood, 3rd edition, Pearson Education.
8. C Programming Language, Kernighan and Ritchie, PHI

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONMOUS)

(M18CS12) Soft Computing Techniques
(CORE COURSE – IV)

M.Tech:II-Semester **L/T/P C**
3/0/- 3

OBJECTIVES

- To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience
- To become familiar with neural networks that can learn from available examples and generalize to form appropriate rules for inferencing systems.
- To provide the mathematical background for carrying out the optimization associated with neural network learning.
- To familiarize with genetic algorithms and other random search procedures useful while seeking global optimum in self-learning situations.
- To introduce case studies utilizing the above and illustrate the intelligent behavior of programs based on soft computing.

UNIT-I: FUZZY SET THEORY

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT-II: OPTIMIZATION

Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT-III: NEURAL NETWORKS

Supervised Learning Neural Networks – Perceptrons - Adaline – Backpropagation Mutilayer Perceptrons – Radial Basis Function Networks – Unsupervised Learning Neural Networks – Competitive Learning Networks – Kohonen Self-Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT-IV: NEURO FUZZY MODELING

Adaptive Neuro-Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross-fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT-V: APPLICATIONS OF COMPUTATIONAL INTELLIGENCE

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

Course Outcomes:

After the completion of this course the students should be able to :

1. Understand the fuzzy logic, concepts of fuzziness involved in fuzzy set theory.
2. Explain the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic.
3. Build the fundamental theory, concepts of neural networks.

4. Identify different neural network architectures, algorithms, applications along their limitations.
5. Classify different learning rules, architectures to learn several neural network paradigms along with its applications.
6. Deploy different applications of these models to solve engineering.

TEXT BOOK:

1. J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2004, Pearson Education 2004.

REFERENCES:

1. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
2. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.
3. S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.
4. R.Eberhart, P.Simpson and R.Dobbins, "Computational Intelligence - PC Tools", AP Professional, Boston, 1996.

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS13) COMPUTER VISION
(PROGRAM ELECTIVE-III)

M.Tech:II-Semester **L/T/P C**
3/0/- 3

Course Objectives

- To build an understanding on detailed models of image formation.
- To expose the students to image feature detection and matching.
- To introduce fundamental algorithms for pattern recognition.
- To introduce various classification techniques.

UNIT I

IMAGE PROCESSING FOUNDATIONS : Image formation and Image model- Components of a vision system- Cameras- camera model and camera calibration-Radiometry- Light in space- Light in surface – Sources, shadows and shading. Multiple images-The Geometry of multiple views- Stereopsis- Affine structure from motion- Elements of Affine Geometry Affine structure and motion from two images- Affine structure and motion from multiple images- From Affine to Euclidean images.

UNIT II

IMAGE PROCESSING TECHNIQUES :Review of image processing techniques – classical filtering operations – thresholding techniques – edge detection techniques – corner and interest point detection – mathematical morphology – texture. High level vision- Geometric methods- Model based vision-Obtaining hypothesis by pose consistency, pose clustering and using Invariants, Verification.

UNIT III

SHAPES AND REGIONS : Binary shape analysis – connectedness – object labeling and counting – size filtering – distance functions – skeletons and thinning – deformable shape analysis – boundary tracking procedures – active contours – shape models and shape recognition – centroidal profiles – handling occlusion – boundary length measures – boundary descriptors – chain codes – Fourier descriptors – region descriptors – moments

UNIT IV

3D VISION AND MOTION : Methods for 3D vision – projection schemes – shape from shading – photometric stereo – shape from texture – shape from focus – active range finding – surface representations – point-based representation – volumetric representations – 3D object recognition – 3D reconstruction – introduction to motion – triangulation – bundle adjustment – translational alignment – parametric motion – splinebased motion – optical flow – layered motion

UNIT V

APPLICATIONS : Application: Photo album – Face detection – Face recognition – Eigen faces – Active appearance and 3D shape models of faces Application: Surveillance – foreground-background separation – particle filters – Chamfer matching, tracking, and occlusion – combining views from multiple cameras – human gait analysis Application: In-vehicle vision system: locating roadway – road markings – identifying road signs – locating pedestrians

Course Outcomes:

After the completion of this course the students should be able to :

1. Elaborate development of algorithms and techniques.
2. Analyze and interpret the visible world around us with real time problems.

3. Apply the fundamental concepts on multi-dimensional signal processing, feature extraction, pattern analysis visual geometric modeling, stochastic optimization etc.
4. Take part to makeup and contribute in research developments in the field of computer vision.
5. Explain different applications ranging from Biometrics, Medical diagnosis, document processing, mining of visual content, to surveillance, advanced rendering etc.
6. Identify applications In-vehicle vision system.

Text Books:

1. Bernd Jahne and Horst HauBecker, Computer vision and Applications, Academic press, 2000.
2. David A. Forsyth & Jean Ponce, Computer vision – A Modern Approach, Prentice Hall, 2002.

REFERENCES:

1. E. R. Davies, "Computer & Machine Vision", Fourth Edition, Academic Press, 2012.
2. R. Szeliski, "Computer Vision: Algorithms and Applications", Springer 2011.
3. Simon J. D. Prince, "Computer Vision: Models, Learning, and Inference", Cambridge University Press, 2012.
4. Mark Nixon and Alberto S. Aquado, "Feature Extraction & Image Processing for Computer Vision", Third Edition, Academic Press, 2012.
5. D. L. Baggio et al., "Mastering OpenCV with Practical Computer Vision Projects", Packet Publishing, 2012.
6. Jan Erik Solem, "Programming Computer Vision with Python: Tools and algorithms for analyzing images", O'Reilly Media, 2012.

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS14) Data Preparation and Analysis
(PROGRAM ELECTIVE-III)

M.Tech:II-Semester **L/T/P C**
3/0/- 3

Objectives: To prepare the data for analysis and develop meaningful Data Visualizations

Unit-I
Data Gathering and Preparation: Data formats, parsing and transformation, Scalability and real-time issues

Unit-II
Data Cleaning: Consistency checking, Heterogeneous and missing data, Data Transformation and segmentation

Unit -III
Exploratory Analysis: Descriptive and comparative statistics, Clustering and association, Hypothesis generation

Unit-IV
Visualization: Designing visualizations, Time series, Geo-located data.

Unit-V
Visualization: Correlations and connections, Hierarchies and networks, interactivity.

Course Outcomes:
After the completion of this course the students should be able to :

1. Work for a business environment dealing with data preparation.
2. Prepare data marts for statistical analysis using SAS software.
3. Implement SAS with an efficient.
4. Analyze data from databases to clean the data for statistical analysis in SAS.
5. Develop many strategies to deal with imperfect real world data.

Text Books:
1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier,2nd Edition, 2006.
2.Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

Reference Books:
1. Data Mining Techniques – Arun K Pujari,2nd edition, Universities Press.
2. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley student Edition
3. The Datyaware house life cycle tool kit -Ralph kinball ,Wiley student edition
4. Data Mining ,Vikram pudi,P.Radha Krishna,Oxford University press

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS15) DIGITAL FORENSICS
(PROGRAM ELECTIVE– III)

M.Tech:II-Semester **L/T/P C**
3/0/- 3

Objectives:

- To focus on the procedures for identification, preservation, and extraction of electronic evidence, auditing and investigation of network and host system intrusions, analysis and documentation of information gathered, and preparation of expert testimonial evidence.
- To provide hands on experience on various forensic tools and resources for system administrators and information system security officers.

Unit-I

Introduction: Introduction of Cybercrime: Types, The Internet spawns crime, Worms versus viruses, Computers' roles in crimes, Introduction to digital forensics, Introduction to Incident - Incident Response Methodology- Steps - Activities in Initial Response, Phase after detection of an incident

Unit-II

Initial Response and forensic duplication 2.1 Initial Response & Volatile Data Collection from Windows system- Initial Response & Volatile Data Collection from Unix system - Forensic Duplication: Forensic duplication: Forensic Duplicates as Admissible Evidence, Forensic Duplication Tool Requirements, Creating a Forensic. 2.2 Duplicate/Qualified Forensic Duplicate of a Hard Drive.

Unit-III

Preserving and Recovering Digital Evidence 3.1 File Systems: FAT, NTFS - Forensic Analysis of File Systems – Storage Fundamentals: Storage Layer, Hard Drives Evidence Handling: Types of Evidence, Challenges in evidence handling, Overview of evidence handling procedure.

Unit-IV

Network Forensics Intrusion detection; Different Attacks in network, analysis Collecting Network Based Evidence - Investigating Routers - Network Protocols - Email Tracing- Internet Fraud.

Unit-V

System investigation 5.1 Data Analysis Techniques - Investigating Live Systems (Windows & Unix) Investigating 5.2 Hacker Tools - Ethical Issues – Cybercrime.

Course Outcomes:

After the completion of this course the students should be able to :

1. Discuss digital forensics related to investigative process.
2. Explain the legal issues to prepare, perform digital forensic analysis based on the investigator's position.
3. Demonstrate the techniques, usage of digital forensics tools.
4. Elaborate digital forensics in detail.
5. Analyze the state of the practice, gaps in technology, policy, and legal issues.
6. Develop techniques used on Data Analysis, cybercrime.

Text Books:

1. Kevin Mandia, Chris Prosise, “Incident Response and computer forensics”, Tata McGrawHill, 2006
2. Peter Stephenson, "Investigating Computer Crime: A Handbook for Corporate

Investigations", Sept 1999
3. Eoghan Casey, "Handbook Computer Crime Investigation's Forensic Tools and Technology", Academic Press, 1st Edition, 2001

References:

1. Skoudis. E., Perlman. R. Counter Hack: A Step-by-Step Guide to Computer Attacks and Effective Defenses.Prentice Hall Professional Technical Reference. 2001
2. Norbert Zaenglein, "Disk Detective: Secret You Must Know to Recover Information From a Computer", Paladin Press, 2000
3. Bill Nelson, Amelia Philips and Christopher Steuart, “Guide to computer forensics investigation “Course technology, 4th edition

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS16) DISTRIBUTED DATABASES
(PROGRAM ELECTIVE-IV)

M.Tech:II Semester **L/T/P C**
3/0/- 3

UNIT-I:

Introduction Features of Distributed databases, Features of Centralized databases, Level of Distributed Transparency, Reference Architecture, Types of Data Fragmentation, Distribution Transparency, access primitives, integrity constraints

UNIT-II:

Distributed Database Design A framework for Distributed Database Design, Design of Database Fragmentation, Allocation of fragments

UNIT-III:

Global And Fragment Queries Global Queries, fragment Queries, Equivalence Transformations for Queries, transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parameter Queries**Optimization Of Access Strategies** Frame Work for Query Optimization, Join Queries, General Queries

UNIT-IV:

Management Of Distributed Transactions Framework for Transaction Management, Atomicity of Distributed Transactions, Concurrence Control for Centralized Database. **Concurrency** Concurrency Control for Distributed databases, Foundations, Locking Protocols, Deadlocks, Timestamps.

UNIT-V:

Reliability Basic concepts, Commitment Protocols, reliability and Concurrency Control, Consistent View of Network, detection and Resolution of Inconsistency, Check points and cold restart. **Distributed Database Systems Commercial Systems** Commercial Systems, Tanden‟s ENCOMPASS Distributed Database systems, IBM‟s inter system Communication, features of Distributed, INGRESS HETEREGENEOUS DATABASE : General problems, brief study of MULTIBASE.

Course Outcomes:
After the completion of this course the students should be able to :

1. Describe various techniques used for data fragmentation, replication, and allocation for a distributed database.
2. Compare simple strategies for executing a distributed query optimization.
3. Learn the two-phase commit protocol on multiple nodes.
4. Describe distributed concurrency control.
5. Illustrate techniques based on the distinguished voting methods.
6. Learn different types of Heterogeneous Database System.

TEXT BOOKS:

1. Ceri. S. Pelagatti G, “Distributed Databases : Principles and Systems”, 1985, MCG
2. Ozsu, “ Principles of Distributed Database Systems”, 1e, 2002, PEA.

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS17) HUMAN COMPUTER INTERACTION
(PROGRAM ELECTIVE– IV)

M.Tech:II-Semester **L/T/P C**
3/0/- 3

Course Objectives

1. Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction.
2. Recognize how a computer system may be modified to include human diversity.
3. Select an effective style for a specific application.
5. Design mock ups and carry out user and expert evaluation of interfaces**.**

UNIT- I

Importance of the user Interface- Characteristics of graphical and web user interfaces, User Interface Design Process: Knowing the client, Understanding business function, Principles of good screen design.

UNIT-II

System Menus and Navigation Schemes, Kinds of windows, Device based controls, Screen based controls, Test and Messages.

UNIT- III

Feedback, Guidance and Assistance. Internationalization an accessibility, graphics, icons and images, colors, Layout windows and pages.

UNIT- IV

Interaction Design: Introduction, Goals, Usability, And Conceptualization interaction: Problem space, Conceptual models, Interface metaphors, Interaction paradigms, Cognition: Conceptual frameworks for cognition. Collaboration and Communication: Social mechanism, Conceptual framework.

UNIT- V

Affective aspects, Expressive interface, User frustration, Agents, Process of interaction design, Activities characteristics, Practical issues, Life cycle models, Design: Prototyping and construction, Prototyping, conceptual design, Physical design Evaluation: Introduction, Framework, Testing and modelling users: Kinds of tests ,Doing user testing, Experiments, Predictive models.

Course Outcomes:

After the completion of this course the students should be able to :

1. Discuss the characteristics of graphical and web user interfaces.
2. Understand the principles of design of business function.
3. Demonstrate the system menus and screen based controls.
4. Adapt the goals and conceptualization interaction.
5. Design the process of interaction and affective aspects
6. Compare the framework, predictive models and prototypes.

TEXT BOOKS:

1. Wilbert O.Galitz, The Essential Guide to User Interface Design, Wiley Dreamtech 2002.
2. Sharp, Rogers, Preece, Interaction Design, John Wiley, 2007.
3. Andrew Sears, Julie A Jacko, Human, Computer Interaction Fundamentals, CRC Press, 2009.

REFERENCE BOOKS:

1. "Designing the User Interface: Strategies for Effective Human-Computer Interaction" by Shneiderman
2. Dan R Oslen, Human, Computer Interaction, Cengage Learning, 2010.

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS18) SOFTWARE PROCESS AND PROJECT MANAGEMENT
(PROGRAM ELECTIVE– IV)

M.Tech: II-Semester **L/T/P C**
3/0/- 3

Objectives:

- Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
- Compare and differentiate organization structures and project structures.
- Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

UNIT-I

Software Process Maturity Software maturity Framework**,** Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process.

Process Reference Models Capability Maturity Model (CMM)**,** CMMI, PCMM, PSP, TSP.

UNIT-II

Software Project Management Renaissance Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way.

Life-Cycle Phases and Process artifacts Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model based software architectures.

UNIT-III

Workflows and Checkpoints of process Software process workflows, Iteration workflows, Major milestones, Minor milestones, Periodic status assessments.

Process Planning Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning.

UNIT-IV

Project Organizations Line-of- business organizations, project organizations, evolution of organizations, process automation.

Project Control and process instrumentation The seven core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, and metrics automation.

UNIT-V

CCPDS-R Case Study and Future Software Project Management Practices Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

Course Outcomes:

After the completion of this course the students should be able to :

1. Discuss and plan to execute projects based on required standards.
2. Understand the range of tools used on project management**.**
3. Analyze the concepts related on project governance and methodologies.
4. Apply critical analysis on solving problems and planning process.
5. Describe planning, Risk and issues management.
6. Plan process, pragmatic planning service delivery and quality assurance

TEXT BOOKS:

1. Managing the Software Process, *Watts S. Humphrey,* Pearson Education.
2. Software Project Management, *Walker Royce,* Pearson Education.

REFERENCE BOOKS:

1. Effective Project Management: Traditional, Agile, Extreme, Robert Wysocki, Sixth edition, Wiley India, rp2011.
2. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000
3. Process Improvement essentials, James R. Persse, O'Reilly, 2006
4. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006
5. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
6. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly, 2007
7. Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, 2nd edition, Wiley India, 2004.
8. The Art of Project Management, Scott Berkun, SPD, O'Reilly, 2011.
9. Applied Software Project Management, Andrew Stellman & Jennifer Greene, SPD, O'Reilly, rp2011.
10. Agile Project Management, Jim Highsmith, Pearson education, 2004.

*****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18AC02) STRESS MANAGEMENT
(AUDIT COURSE)

M.Tech: II-Semester **L/T/P C**
2/0/- 0

UNDERSTANDING STRESS Meaning – Symptoms – Work Related Stress – Individual Stress – Reducing Stress -sources of stress –consequence of stress-burnout-symptoms of Burnout- stress verses Burnout-model of stress-strategies for coping stress (individual and organizational strategies) –case study

TIME MANAGEMENT Techniques – Importance of Planning the day –developing concentration – Prioritizing Beginning at the start – Techniques for conquering procrastination – Sensible delegation – Taking the right breaks – Learning to say "No"

CAREER PLATEAU Career plateau – Identifying Career plateaus – Structural and Content - Plateauing – Making a fresh start – Importance of Sabbaticals – Counseling out – Executive leasing – Sustaining a marketable Career.

CRISIS MANAGEMENT Implications – People issues – Structure issues – Environmental issues – Learning to keep calm - Preventing interruptions – Controlling crisis – Pushing new ideas – Empowerment – Work place Humour, Developing a sense of Humour – Learning to laugh – role of group cohesion and team spirit.

SELF DEVELOPMENT Improving personality – Leading with Integrity – Enhancing Creativity – Effective decision making – Sensible Communication – The Listening Game – Managing Self – Mediation for peace – Yoga for Life

Course Outcomes:

After the completion of this course the students should be able to :

1. Maintain a stress awareness log. Include identification of causes, symptoms, and analysis of effects.
2. Gather information on current stress management techniques and evaluate personal relevance.
3. Practice specific techniques, track effectiveness, and revise to meet personal preferences.
4. Choose an adaptable stress management plan for academic success incorporating selected techniques.

TEXT BOOKS

1. Bhatia R.L., The Executive Track: An Action Plan for Self DevelopmentWheeler Publishing, New Delhi
3. Charavathy.S.K, "Human Values for Manager", McGraw Hill/HenelyManagement Series

REFERENCES

1. Jeffr Davison, Managing Stress, Prentice Hall of India, New Delhi
2. Jerrold S Greenberg, Comprehensive Stress Management, Jain Books, 2009

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS19) NETWORK PROGRAMMING LAB
(LABORATORY-III)

M.Tech: II-Semester **L/T/P C**
3/0/- 3

Week 1:Understanding and using of commands like ifconfig, netstat, ping, arp, telnet, ftp, finger, traceroute, whois

Week 2: Socket Programming: Implementation of Connection-Oriented Service using standard ports.

Week 3: Implementation of Connection-Less Service using standard ports

Week 4: Implementation of Connection-Oriented Iterative Echo-Server, date and time, character generation using user-defined ports

Week 5:Implementation of Connectionless Iterative Echo-server, date and time, character generation using user-defined ports.

Week 6: Implementation of Connection-Oriented Concurrent Echo-server, date and time, character generation using user-defined ports

Week 7: Program for connection-oriented Iterative Service in which server reverses the string sent by the client and sends it back

Week 8: Program for connection-oriented Iterative service in which server changes the case of the strings sent by the client and sends back (Case Server).

Week 9: Program for Connection-Oriented Iterative service in which server calculates the Net-salary of an Employee based on the following details sent by the

Week 10: Program for file access using sockets

Week 11: Program for Remote Command Execution using sockets

Week 12: Implementation of DNS

Week 13: Program to implement Web Server using sockets

Week 14: Advanced Socket System Calls : Programs to demonstrate the usage of Advanced socket system calls like getsockopt( ),setsockopt( ),getpeername ( ),getsockname( ),readv( ) and writev()

Course Outcomes:
After the completion of this course the students should be able to :

1. Understand the concepts of Socket commands.
2. Implement Connection-Oriented Service using standard ports.
3. Define Connectionless and Connection Oriented Service.
4. Plan a case study on client and server and construct a Remote Command Execution using sockets.

***

VAAGDEVI COLLEGE OF ENGINEERING

(AUTONOMOUS)

(M18CS20) Digital Forensics Lab

(LABORATORY-IV)

M.Tech: I I Semester **L/T/P C**

2 0 0 2

Course Objectives

Week 1: Mr.X has lost his data on his device. Analyse different processes and Retrieve the lost data?

Week 2: Study and Perform various metadata techniques

Week 3:. (a). Study and Perform email investigation techniques

(b). Perform various mobile forensic techniques

Week 4: (a). Perform how to grab the ip address of a suspect

(b). Study and Perform how to trace a ip address

Week 5:. Perform how to capture packets from a mobile phone

Week 6: Perform various Network forensic analysis in detail

Week 7: Perform Hashing process

Week 8: Perform various Open-source intelligence techniques

Week 9: (a). Study and Understand Cyber-Forensics experimentation methodology

(b). Develop a Certification Process for Cyber Forensic Technologies

Week 10: (a). Comparison of files using HEX editor and FC command

(b). Perform extraction of browser artifacts

(c). File carving using TESTDISK and PHOTOREC

Course Outcomes:

After the completion of this course the students should be able to :

1. Understand the methods available for retrieving the lost data.
2. Classify the various mobile forensic techniques and how to handle them.
3. Identify the different Open-source intelligence techniques
4. Demonstrate how to develop certification for Cyber Forensic.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS22) SEMANTIC WEB AND SOCIALNETWORKS
(PROGRAM ELECTIVE –V)

M.Tech:III-Semester **L/T/P C**
3/0/- 3

Objectives:

- To learn Web Intelligence
- To learn Knowledge Representation for the Semantic Web
- To learn Ontology Engineering
- To learn Semantic Web Applications, Services and Technology
- To learn Social Network Analysis and semantic web

UNIT –I:

Web Intelligence Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT -II:

Knowledge Representation for the Semantic Web Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL), UML, XML/XML Schema.

UNIT-III:

Ontology Engineering Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

UNIT-IV:

Semantic Web Applications, Services and Technology Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base ,XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT-V:

Social Network Analysis and semantic web What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

Course Outcomes:

After the completion of this course the students should be able to :

1. Perceive the concept structure of the semantic web technology and how this technology revolutionizes the World Wide Web and its uses.
2. Analyze the concepts of metadata, semantics of knowledge and resource, ontology, and their descriptions in XML-based syntax and web ontology language (OWL).
3. Describe logic semantics and inference with OWL.
4. Use ontology engineering approaches in semantic applications
5. Program semantic applications with Java API.
6. Perceive the concept structure of the semantic web technology and how this technology revolutionizes the World Wide Web and its uses.

TEXT BOOKS:

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley inter science, 2008.

2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCE BOOKS:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, R.Studer, P.Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
3. Information sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T.Segaran, C.Evans, J.Taylor, O'Reilly, SPD.

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS23) MOBILE APPLICATION AND SECURITY
(PROGRAM ELECTIVE-V)

M.Tech:III-Semester **L/T/P C**
3/0/- 3

Course Objectives:

- To understand the mobile issues and development strategies.
- To understand the WAP and mobile security issues.
- To understand the Bluetooth security issues.

UNIT - I:

Top Mobile Issues and Development Strategies: Top Issues Facing Mobile Devices, Physical Security , Secure Data Storage (on Disk), Strong Authentication with Poor Keyboards , Multiple-User Support with Security, Safe Browsing Environment , Secure Operating Systems, Application Isolation, Information Disclosure, Virus, Worms, Trojans, Spyware, and Malware , Difficult Patching/Update Process, Strict Use and Enforcement of SSL, Phishing , Cross-Site Request Forgery (CSRF), Location Privacy/Security, Insecure Device Drivers, Multifactor Authentication, Tips for Secure Mobile Application Development .

UNIT - II:

WAP and Mobile HTML Security :WAP and Mobile HTML Basics , Authentication on WAP/Mobile HTML Sites , Encryption , Application Attacks on Mobile HTML Sites ,Cross-Site Scripting , SQL Injection , Cross-Site Request Forgery , HTTP Redirects , Phishing , Session Fixation , Non-SSL Login , WAP and Mobile Browser Weaknesses , Lack of HTTPOnly Flag Support , Lack of SECURE Flag Support , Handling Browser Cache , WAP Limitations.

UNIT - III:

Bluetooth Security: Overview of the Technology , History and Standards , Common Uses , Alternatives , Future , Bluetooth Technical Architecture , Radio Operation and Frequency, Bluetooth Network Topology , Device Identification , Modes of Operation , Bluetooth Stack ,Bluetooth Profiles , Bluetooth Security Features , Pairing , Traditional Security Services in Bluetooth, Security “Non-Features” , Threats to Bluetooth Devices and Networks, Bluetooth Vulnerabilities , Bluetooth Versions Prior to v1.2, Bluetooth Versions Prior to v2.1.

UNIT - IV:

SMS Security: Overview of Short Message Service, Overview of Multimedia Messaging Service, Wireless Application Protocol (WAP), Protocol Attacks , Abusing Legitimate Functionality, Attacking Protocol Implementations, Application Attacks , iPhone Safari , Windows Mobile MMS, Motorola RAZR JPG Overflow, Walkthroughs ,Sending PDUs ,Converting XML to WBXML .

UNIT - V

Enterprise Security on the Mobile OS: Device Security Options , PIN , Remote , 346 Secure Local Storage , Apple iPhone and Keychain , Security Policy Enforcement ,Encryption ,Full Disk Encryption ,E-mail Encryption , File Encryption , Application Sandboxing, Signing, and Permissions , Application Sandboxing , Application Signing , Permissions , Buffer Overflow Protection ,Windows Mobile , iPhone ,Android ,BlackBerry , Security Feature Summary.

Course Outcomes:

After the completion of this course the students should be able to :

1. Explain the mobile issues and development strategies.
2. Discuss WAP and mobile security issues.
3. Define the Bluetooth security issues.
4. Classify the SMS Security issues.
5. Demonstrate the Enterprise Security on the Mobile OS.
6. Develop Application and security on Mobile OS.

TEXT BOOK:

1. "Mobile Application Security", Himanshu Dwivedi, Chris Clark, David Thiel, TATA McGRAW-Hill.

REFERENCES:

1. "Mobile and Wireless Network Security and Privacy", Kami S. Makki, et al, Springer.

2. "Android Security Attacks Defenses", Abhishek Dubey, CRC Press.

****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18CS24) Compiler For HPC
(PROGRAM ELECTIVE-V)

M.Tech: III-Semester **L/T/P C**
3/0/- 3

Course Objective

- High Performance Computing is to provide basic knowledge in High Performance Computing with lab sessions on Parallel Programming.
- The programme will focus on practical aspects and include examples which are relevant to the current industry requirements.

Unit-I:
Introduction: Implicit parallelism, Memory system performance Parallel algorithm design: Preliminaries, decomposition techniques, tasks and interactions, load balancing, methods for reducing interaction overheads, parallel algorithm models Basic communication operations: Meaning of all-to-all, all-reduce, scatter, gather, circular shift and splitting routing messages in parts.

Unit-II:
Analytical modeling of parallel programs: sources of overhead, performance metrics, the effect of granularity on performance, scalability of parallel systems, minimum execution time, minimum costoptimal execution time, asymptotic analysis of parallel programs
Programming using message passing paradigm: Principles, building blocks, MPI, Topologies and embedding, Overlapping communication and computation,

UNIT-III:
Programming shared address space platforms: Threads, POSIX threads, Synchronization primitives, attributes of threads, mutex and condition variables, Composite synchronization constructs, OpenMP Threading Building blocks; An Overview of Memory Allocators, An overview of Intel Threading building blocks; An Overview of Brief History of GPUs; An Overview of GPU Programming; An Overview of GPU Memory Hierarchy Features; Introduction to Heterogeneous Computing – OpenCL; The OpenCL Kernel, The OpenCL Memory Model, The OpenCL Execution Model; OpenCL Platform and Devices; OpenCL Execution Environment, An Overview of OpenCL API;

Unit-IV:
Heterogeneous Programming in OpenCL An Overview of CUDA enabled NVIDIA GPUs, Introduction to CUDA C, Parallel Programming in CUDA C; Dense Matrix Algorithms: matrix vector multiplication, matrix-matrix multiplication, solving system of linear equations,

Unit-V:
Sorting: Sorting networks, Bubble sort, Quick sort, Bucket sort and other sorting algorithms Graph algorithms: Minimum spanning tree, single source shortest paths, all-pairs shortest paths, Transitive closure, connected components, algorithms for sparse graphs

Course Outcomes:
After the completion of this course the students should be able to :

1. Transform algorithms in the computational area to efficient programming code for modern computer architectures;
2. Discuss, organise and handle programs for scientific computations;

3. Develop tools for performance optimisation and debugging;
4. Analyse code with respect to performance and suggest and implement performance improvements.
5. Report on performance analysis in clear and correct writing.
6. Implement algorithms on sparse graphs.

Text Books :

1. AnanthGrama, Anshul Gupta, George Karypis, Vipin Kumar : Introduction to Parallel Computing, Second Edition Pearson Education, 2007
2. Benedict R Gaster, Lee Howes, David R KaeliPerhaadMistry Dana Schaa, Heterogeneous Computing with OpenCL McGraw-Hill, Inc. Newyork , 2011

Reference Books :

1. Michael J. Quinn, Parallel Programming in C with MPI and OpenMP McGraw-Hill International Editions, Computer Science Series, 2004
2. Jason Sanders, Edward Kandrot, CUDA By Example – An IntroJason Sanders, Edward Kandrot, CUDA By Example – An Introduction to GeneralPurpose GPU Programming, Addison Wesley, 2011.

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18MA01) ADVANCED OPTIMIZATION TECHNIQUES
(Open Elective – 1)

M.Tech:III-Semester **L/T/P C**
3/0/- 3

Course Objectives

- To understand the theory of optimization methods and algorithms developed for solving various types of optimization problems .
- To develop and promote research interest in applying optimization techniques in problems of Engineering and Technology.
- To apply the mathematical results and numerical techniques of optimization theory to concrete Engineering problems.

UNIT-I:
Single Variable Non-Linear Unconstrained Optimization: One dimensional Optimization methods:- Uni-modal function, elimination methods, ,, Fibonacci method, golden section method, interpolation methods – quadratic & cubic interpolation methods.

UNIT-II:
Multi variable non-linear unconstrained optimization: Direct search method – Univariant method - pattern search methods – Powell's- Hook -Jeeves, Rosenbrock search methods- gradient methods, gradient of function, steepest decent method, Fletcher Reeves method, variable metric method.

UNIT-III:
Linear Programming: Formulation – Sensitivity analysis. Change in the constraints, cost coefficients, coefficients of the constraints, addition and deletion of variable, constraints. Simulation – Introduction – Types- steps – application – inventory – queuing systems

UNIT-IV:
Integer Programming: Introduction – formulation – Gomory cutting plane algorithm – Zero or one algorithm, branch and bound method Stochastic programming: Basic concepts of probability theory, random variables- distributions-mean, variance, correlation, co variance, joint probability distribution- stochastic linear, dynamic programming.

UNIT-V:
Geometric Programming: Polynomials – arithmetic – geometric inequality – unconstrained G.P constrained G.P (<= TYPE ONLY) Non-traditional optimization Techniques: Genetic Algorithms-Steps-Solving simple problems Comparitions of similarities and dissimilarities between traditional and non-traditional techniques Particle Swarm Optimization (PSO)- Steps(Just understanding)-Simulated Annealing-Steps-Simple problems.

Course Outcomes:

After the completion of this course the students should be able to :

1. Describe problem clearly, identify and analyze the individual functions.
2. Analyze study on solving optimization problem.
3. Translate verbal formula on optimization problem.
4. Design algorithms, reliably to find an approximate solution.
5. Compare the performance of an algorithm.
6. Discovery, study, understand and solve optimization techniques using algorithms.

REFERENCES:

1. Optimization theory & Applications / S.S. Rao / New Age International.
2. Engineering Optimization-Kalyan Deb/ PHI
3. Introductory to operation Research / Kasan & Kumar / Springar
4. Optimization Techniques theory and practice / M.C.Joshi, K.M. Moudgalya/ Narosa
5. Publications
6. Operation Research / H.A. Taha /TMH
7. Optimization in operations research / R.L Rardin 8. Optimization Techniques /Benugundu & Chandraputla / Pearson Asia

*****

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(M18SE27) WASTE MANAGEMENT
(OPEN ELECTIVE)

M.Tech: III-Semester **L/T/P C**
3/0/- 3

Course Objective: This course covers various aspects of hazardous waste, biomedical waste and E-waste such as collection, segregation, recovery, labeling requirements, storage areas, treatment and disposal facilities.

UNIT-I:
Sources, Composition and characteristic of hazardous waste, Hazardous Waste (Management and Handling) Rules, 1989 and amendments, Federal Hazardous Waste Regulations under RCRA, Superfund, CERCLA and SARA. Toxicology, public health impact, Protocols, issues and challenges in transportation of hazardous waste.

UNIT-II:
Municipal Solid Waste Management – Fundamentals Sources; composition; generation rates; collection of waste; separation, transfer and transport of waste; treatment and disposal options Radioactive Waste Management – Fundamentals Sources, measures and health effects; nuclear power plants and fuel production; waste generation from nuclear power plants; disposal options

UNIT-III:
Characterization of medical waste- Bio-medical wastes (Management and Handling) Rules, 1998, Amendments and guidelines, segregation, packaging, storage, transport of infectious waste. Techniques of Biomedical waste management. Health and safety rules. Protocols, issues and challenges in transportation of Biomedical waste.

UNIT-IV:
Treatment method- Autoclave, Hydroclave, Microwave, Chemical Disinfection, Solidification and stabilization, Bioremediation, Thermal Conversion Technologies, accumulation and storage of hazardous waste, land disposal of hazardous waste, other treatment and disposal method. Common Hazardous Waste Treatment facilities (TSDF).

UNIT-V:
E-waste: Introduction, toxicity due to hazardous substances in e-waste and their impacts, domestic e-waste disposal, e-waste management, technologies for recovery of resource from electronic waste, guidelines for environmentally sound management of e-waste, occupational and environmental health perspectives of recycling e-waste in India.

Course Outcomes:

After the completion of this course the students should be able to :

1. Compare the subject from the technical, legal and economical points .
2. Learn solid waste management.
3. Describe environment for sound management.
4. Understand a municipal solid waste management system.
5. Plan a solid waste management system for decision makers.
6. Design an incineration facility.

Reference Books:

- Tchobanoglous G., Theisen H., Viquel S.A., "Integrated Solid Waste Management: Engineering,
- Principles and Management issues", Tata McGraw Hill Publishing Company Ltd., New Delhi.
- CPHEEO Manual on Municipal Solid Waste Management.
- Peavy H.S., Rowe D.R., Tchobanoglous G., "Environmental Engineering", Tata McGraw Hill Publishing Company Ltd., New Delhi.
- Cunningham W.P., Cunningham M.A., "Principles of Environmental Science", Tata McGraw Hill Publishing Company Ltd., New Delhi.

***

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONMOUS)

(M18VL07) EMBEDDED SYSTEMS DESIGN
(OPEN ELECTIVE-I)

M.Tech: III-Semester **L/T/P C**
3/-/- 3

Course Objectives:
To explain various embedded system applications and design requirements.
- To construct embedded system hardware.
- To develop software programs to control embedded system.
- To generate product specification for embedded system.

UNIT-I:
Introduction to Embedded Systems: Embedded Systems, Processor Embedded into a System, Embedded Hardware Units and Devices in a System, Embedded Software, Complex System Design, Design Process in Embedded System, Formalization of System Design, Classification of Embedded Systems

UNIT-II:
8051 and Advanced Processor Architecture: 8051 Architecture, 8051 Micro controller Hardware, Input/output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/output, Interrupts, Introduction to Advanced Architectures, Real World Interfacing, Processor and Memory organization - Devices and Communication Buses for Devices Network: Serial and parallel Devices & ports, Wireless Devices, Timer and Counting Devices, Watchdog Timer, Real Time Clock, Networked Embedded Systems, Internet Enabled Systems, Wireless and Mobile System protocols

UNIT-III:
Embedded Programming Concepts: Software programming in Assembly language and High Level Language, Data types, Structures, Modifiers, Loops and Pointers, Macros and Functions, object oriented Programming, Embedded Programming in C++ & JAVA

UNIT-IV:
Real – Time Operating Systems: OS Services, Process and Memory Management, Real – Time Operating Systems, Basic Design Using an RTOS, Task Scheduling Models, Interrupt Latency, Response of Task as Performance Metrics - RTOS Programming: Basic functions and Types of RTOSES, RTOS VxWorks, Windows CE

UNIT-V:
Embedded Software Development Process and Tools: Introduction to Embedded Software Development Process and Tools, Host and Target Machines, Linking and Locating Software, Getting Embedded Software into the Target System, Issues in Hardware-Software Design and Co-Design - Testing, Simulation and Debugging Techniques and Tools: Testing on Host Machine, Simulators, Laboratory Tools

Course Outcomes:
After the completion of this course the students should be able to :
1. Describe embedded systems, design, technology to explain its metrics or challenges.
2. Design custom single – purpose processors using combinational as well as sequential logic.
3. Discuss about optimizing single – purpose processors. Discuss about the basic architecture and operation of general purpose processors.

4. Define and distinguish between a timer and a counter, various types of timers and Universal Asynchronous Receiver/ Transmitter. Explain controllers for LCD, Keypad and Stepper Motor.
5. Discuss common memory types ROM, RAM, advanced RAM. Explain microprocessor interfacing and arbitration methods, various protocols like serial, parallel.
6. Explain basics of interrupts, architectures like Round Robin, Real – Time Operating System architecture.

TEXT BOOK:

1. Embedded Systems, Raj Kamal, Second Edition TMH.
2. Introduction to Embedded Systems by K.V.Shibu.

REFERENCE BOOKS:

1. Embedded/Real-Time Systems, Dr. K.V.K.K. Prasad, dream Tech press
2. The 8051 Microcontroller and Embedded Systems, Muhammad Ali Mazidi, Pearson.
3. The 8051 Microcontroller, Third Edition, Kenneth J. Ayala, Thomson.
4. An Embedded Software Primer, David E. Simon, Pearson Education.
5. Micro Controllers, Ajay V Deshmukhi, TMH.
6. Microcontrollers, Raj Kamal, Pearson Education.
7. Introduction to Embedded Systems, Shibu K. V, TMH.

***