

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES**(UGC-AUTONOMOUS)****M.TECH -COMPUTER SCIENCE AND ENGINEERING****COURSE STRUCTURE**

(Applicable for the batches admitted from 2018-19)

I YEAR**I SEMESTER**

S No	Code	Subject	Internal Marks	External Marks	L	T	P	Credits
1	JD581C01	Program Core-I Advanced Data Structure and Algorithms	30	70	3	0	0	3
2	JD581C02	Program Core-II Operating System and Internals	30	70	3	0	0	3
3	JD581E01 JD581E02 JD581E03 JD581E04	Program Elective-I 1.Security in Computing 2.Internet of Things 3.Agent Based Intelligent Systems 4.Cloud Computing	30	70	3	0	0	3
4	JD581E05 JD581E06 JD581E07 JD581E08	Program Elective-II 1.Network Engineering and Management 2.Natural Language Processing 3.Ad-Hoc and Sensor Networks 4.Software Quality Assurance	30	70	3	0	0	3
5	JD581A01	Research Methodology and IPR	30	70	2	0	0	2
6	JD581A02	Audit Course	100	-	2	0	0	0
7	JD581L1	Laboratory 1 Advanced Data Structure and Algorithms Laboratory	30	70	0	0	4	2
8	JD581L2	Laboratory 2 Advanced Operating System Laboratory	30	70	0	0	4	2
							Total Credits	18

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

M.TECH -COMPUTER SCIENCE AND ENGINEERING
COURSE STRUCTURE

(Applicable for the batches admitted from 2018-19)

I YEAR

II SEMESTER

S No	CODE	Subject	Internal Marks	External Marks	L	T	P	Credits
1	JD581C03	Program Core-III Advanced Database Technology	30	70	3	0	0	3
2	JD581C04	Program Core-IV Network Programming	30	70	3	0	0	3
3	JD581E09 JD581E10 JD581E11 JD581E12	Program Elective-III 1.Advanced communication Networks 2.Software process and Project Management 3.High Speed Networks 4. Soft Computing	30	70	3	0	0	3
4	JD581E13 JD581E14 JD581E15 JD581E16	Program Elective-IV 1.Information Storage Management 2.Social Network Analysis 3.Digital Image Processing 4.Data Mining Techniques	30	70	3	0	0	3
5	JD581A03	Audit Course	100	-	2	0	0	0
6	JD581L3	Laboratory 3 Advanced Database Technology Laboratory	30	70	0	0	4	2
7	JD581L4	Laboratory 4 Network Programming Laboratory	30	70	0	0	4	2
8	JD581S1	Mini Project with Seminar	30	70	2	0	0	2
Total Credits								18

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)**

**M.TECH -COMPUTER SCIENCE AND ENGINEERING
COURSE STRUCTURE**

(Applicable for the batches admitted from 2018-19)

IIYEAR			I SEMESTER					
S No	CODE	Subject	Internal Marks	External Marks	L	T	P	Credits
1	JD581E16	Program Elective-V 1. Software Quality Assurance and Testing 2. Embedded Software Development 3. Mobile Application Development 4. Internet and web technology	30	70	3	0	0	3
	JD581E17							
	JD581E18							
	JD581E19							
2	JD581O01	Open Elective-I	30	70	3	0	0	3
3	JDPR158	Dissertation-I	30	70	0	0	20	10
		<i>Total Credits</i>						16

Open Elective-1

1. Object Oriented software Engineering
2. Business Analytics
3. Parallel and Distribution Algorithm
4. Embedded System
5. Software architecture and design patterns

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
M.TECH -COMPUTER SCIENCE AND ENGINEERING
COURSE STRUCTURE

(Applicable for the batches admitted from 2018-19)

II YEAR

II SEMESTER

S No	CODE	Subject	Internal Marks	External Marks	L	T	P	Credits
1	JDPR258	Dissertation-I	30	70	0	0	32	16
		<i>Total Credits</i>						16

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

L T P C

3 0 0 3

JD581C02 ADVANCED DATA STRUCTURES AND ALGORITHMS

Course Objectives

1. To understand the usage of algorithms in computing.
2. To learn and use hierarchical data structures and its operations
3. To learn the usage of graphs and its applications.
4. To select and design data structures and algorithms that is appropriate for problems.
5. To study about NP Completeness of problems.

Course Outcomes (COs)

1. Analyze the complexity of algorithms.
2. Design and analyze the Linear data structures
3. Implement Searching and sorting Concepts.
4. Design and implement Non Linear data structures
5. Implement Text compression Algorithms.

UNIT I INTRODUCTION

9

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

9

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-Array List, Linked List, Vector classes, Stacks and Queues in java.util, Iterators in java.util.

UNIT III SEARCHING AND SORTING

9

Searching–Linear and binary search methods, Hashing-Hash functions, Collision Resolution methods- Open Addressing, Chaining, Hashing in java.util-HashMap, Hash Set, Hash table.

Sorting –Bubble sort, Insertion sort, Quick sort, Merge sort, Heap sort, Radix sort, comparison of sorting methods.

UNIT IV TREES AND GRAPHS

9

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 BFS, 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 TREES AND TEXT COMPRESSION

9

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,

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

L T P C

3 0 0 3

Trees in java.util- Tree Set, Tree Map Classes, Tries(examples only), Comparison of Search trees. Text compression-Huffman coding and decoding, Pattern matching-KMP algorithm.

Total: 45 Hours

REFERENCE 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).
4. Java for Programmers, Deitel and Deitel, Pearson education.
5. Data structures and Algorithms in Java, R.Lafore, Pearson education.
6. Java: The Complete Reference, 8th editon, Herbert Schildt, TMH.
7. Data structures and Algorithms in Java, M.T.Goodrich, R.Tomassia, 3rd edition.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

JD581C02 OPERATING SYSTEM INTERNALS

Course Objectives

1. To know the components of the operating systems.
2. To understand the concept of process management, storage management, Input Output and file systems.
3. To cognize perception of distributed operating systems concepts.

Course Outcomes (COs)

1. Analyze the requirements of operating system and demonstrate the scheduling mechanisms.
2. Implement the algorithm for memory management techniques.
3. Understand the needs of distributed operating system.
4. Analyze the resource management strategies.
5. Classify the distributed file models.

UNIT I PROCESS MANAGEMENT

11

Operating system and services - Process structure and PCB - Threads – Inter process communication – CPU scheduling approaches - Process synchronization-The Critical-section problem-Peterson’s solution-Synchronization hardware-Mutex locks-Semaphores – Monitors- Deadlocks.

UNIT II MEMORY MANAGEMENT AND FILE MANAGEMENT

9

Memory management- Paging- Segmentation-Virtual memory- Demand paging – Page replacement algorithms- File systems – Access methods – Directory structure and implementation– File System structure and implementation – Allocation methods.

UNIT III DISTRIBUTED OPERATING SYSTEM

9

Introduction-Remote procedure call – Logical clocks – Vector clocks – Distributed mutual exclusion – Non token based algorithms – Token based algorithms– Deadlock detection algorithms – Election algorithms -Byzantine agreement problem-Load distributing algorithms – Performance comparison.

UNIT IV DISTRIBUTED RESOURCE MANAGEMENT

8

Distributed file systems – Architecture-Design issues-Distributed shared memory-Architecture- Algorithms distributed shared memory models- Distributed shared memory synchronization- consistency-Memory coherence – Coherence protocols - Design issues.

UNIT V DISTRIBUTED FILE SYSTEMS

8

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

L T P C

3 0 0 3

Introduction, good features of DFS- File models- File accessing models- File sharing semantics- File-Caching schemes- File replication- Fault tolerance- Atomic transactions and design principles.

Total: 45 Hours

REFERENCE BOOKS:

1. Abraham Silberschatz, Peter B. Galvin and Greg Gagne, Operating System Concepts. New Delhi: Addison Wesley Publishing Company, 2012
2. MukeshSinghal, and NiranjanShivratri, Distributed operating system. New Delhi: TMH, 2001
3. William Stallings, Operating Systems Internals and Design Principles. New Delhi: Pearson Education, 2011.
4. Naji, Linux OS. New Delhi: Prentice Hall of India, 2003
5. C.M. Krishna, Kang G. Shin, Real-Time Systems, McGraw-Hill International Editions, **1997**.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

JD581E01 SECURITY IN COMPUTING

Course Objectives:

1. To learn the vulnerabilities and threats in the computing systems
2. To understand the cryptography based approaches in security
3. To know the implementation and use of security mechanisms

Course Outcomes (COs)

4. Apply cryptographic algorithms for encryption and decryption for secure data transmission.
5. Identify the threats against networked applications.
6. Analyze the security problems in database systems and data mining.
7. Exemplify the protection features of an operating system.
8. Understand the legal, copyright and privacy issues.

UNIT I- SECURITY ISSUES IN COMPUTING 9

Introduction to computer security – Computer criminals – Methods of defense – Cryptography – Terminology and background - Making encryption algorithms– Data encryption standard: Background and history- Overview of DES algorithm- Fundamentals concepts of DES- Double and triple DES.

UNIT II- PROGRAM SECURITY AND NETWORK SECURITY 9

Secure programs- Non malicious program errors- Threats in networks- Network security controls- Firewalls: Types-Design of firewall- Personal firewall- Comparison of firewall types.

UNIT III -DATABASE SECURITY AND DATA MINING SECURITY 9

Introduction to databases - Security requirements – Reliability and integrity – Sensitive data – Inference: Direct attack and indirect attack – Multilevel database– Data mining- Privacy and sensitivity – Data correctness and integrity – Availability of data.

UNIT IV- DESIGN AND PROTECTION OF OPERATING SYSTEM 9

Protected objects and methods of protection- Memory and address protection- Control of access to general objects-User authentication- Trusted system – Security policies – Models of security- Trusted operating system design.

UNIT V- LEGAL ISSUES IN COMPUTER SECURITY 9

Protecting programs and data – Information and the law – Rights of employees and employers – Computer crime-Administering security- Security planning – Risk analysis – Organizational security policies. Cyber security- AES encryption algorithm- Viruses and targeted malicious code.

Total: 45 Hours

REFERENCE BOOKS:

1. Charles B.fleeger and Shari Lawrence Pfleeger, Security in Computing, Fifth Edition, 2015, Pearson Education.
2. William Stallings, Cryptography and Network Security: Principles and Practice,Prentice Hall of India/Pearson Education, New Delhi, Fifth edition,2011.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

L T P C

3 0 0 3

3. Dieter Gollmann, Computer Security, John Wiley & Sons Ltd., 2011.
4. Douglas R.Stinson, Cryptography Theory and Practice, CRC, 2006

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

JD581E02 INTERNET OF THINGS

Course Objectives

1. To understand the fundamentals of Internet of Things
2. To learn about the basics of IOT protocols
3. To build a small low cost embedded system using Raspberry Pi.
4. To apply the concept of Internet of Things in the real world scenario.

Course Outcomes (COs)

1. Analyze various protocols for IoT
2. Develop web services to access/control IoT devices.
3. Design a portable IoT using Raspberry Pi
4. Deploy an IoT application and connect to the cloud.
5. Analyze applications of IoT in real time scenario

UNIT I INTRODUCTION TO IoT 9
Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels & Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG- IoT Platforms Design Methodology.

UNIT II IoT ARCHITECTURE 9
M2M high-level ETSI architecture - IETF architecture for IoT - OGC architecture - IoT reference model - Domain model - information model - functional model - communication model - IoT reference architecture.

UNIT III IoT PROTOCOLS 9
Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus– Zigbee Architecture – Network layer – 6LowPAN - CoAP – Security.

UNIT IV BUILDING IoT WITH RASPBERRY PI & ARDUINO 9
Building IOT with RASPBERRY PI- IoT Systems - Logical Design using Python – IoT Physical Devices & Endpoints - IoT Device -Building blocks -Raspberry Pi -Board - Linux on Raspberry Pi - Raspberry Pi Interfaces -Programming Raspberry Pi with Python - Other IoT Platforms - Arduino.

UNIT V CASE STUDIES AND REAL-WORLD APPLICATIONS 9
Real world design constraints - Applications - Asset management, Industrial automation, smart grid, Commercial building automation, Smart cities - participatory sensing - Data Analytics for IoT– Software & Management Tools for IoT Cloud Storage Models & Communication APIs – Cloud for IoT - Amazon Web Services for IoT.

Total: 45 Hours

REFERENCE BOOKS:

1. Arshdeep Bahga, Vijay Madiseti, —Internet of Things – A hands-on approach, Universities Press, 2015

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), —Architecting the Internet of Things, Springer, 2011.
3. Honbo Zhou, —The Internet of Things in the Cloud: A Middleware Perspective, CRC Press, 2012.
4. Jan Ho" ller, Vlasios Tsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014.
5. Olivier Hersent, David Boswarthick, Omar Elloumi , —The Internet of Things – Key applications and Protocols, Wiley, 2012

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

JD581E03

AGENT BASED INTELLIGENT SYSTEMS

Course Objectives:

1. To introduce the fundamental concepts of artificial intelligence
2. To explore the different paradigms in knowledge representation and reasoning
3. To recognize problems to solve using artificial intelligence and machine learning

Course Outcomes (COs)

1. Understand the history, development and various applications of artificial intelligence
2. Learn the knowledge representation and reasoning techniques in logic programming
3. Familiarize with constructing plans in planning agents.
4. Analysis the concept in presence of uncertainty.
5. Apply and integrate various artificial intelligence techniques in intelligent system development

UNIT INTRODUCTION

9

Definitions - Foundations - History - Intelligent agents: Nature of environment-Structure of agents-problem solving-Searching: uninformed search strategies-Searching with partial information – Heuristics: Local search algorithms – Constraint satisfaction problems: Backtracking search - Game playing: Optimal decisions-Alpha, Beta pruning.

UNIT II KNOWLEDGE REPRESENTATION AND REASONING

9

Logical Agents: Propositional logic-Reasoning patterns in propositional logic-Agent based propositional logic-First order logic: Syntax and semantics-First order inference: Unification- Chaining- Resolution strategies-Knowledge representation: Objects-Actions-Events.

UNIT III PLANNING AGENTS

9

Planning problem: State space search-Partial order planning-Graphs-Hierarchical network planning-Nondeterministic domains-Conditional planning-Execution monitoring and replanning- Continuous planning-Multi agent planning.

UNIT IV AGENTS AND UNCERTAINTY

9

Acting under uncertainty – Probability notation-Bayes rule and use –Probabilistic reasoning: Bayesian networks-Other approaches-Time and uncertainty: Temporal models-Simple decisions: Utility theory - Decision network – Complex decisions: Value iteration-Policy iteration.

UNIT V HIGHER LEVEL AGENTS

9

Knowledge in learning: Explanation based learning-Relevance information-Statistical learning methods: Instance based learning-Neural network-Reinforcement learning: Passive and active communication: Formal grammar- Augmented grammars-Future of AI.

Total: 45 Hours

REFERENCE BOOKS:

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

1. Stuart Russell and Peter Norvig, Artificial Intelligence - A Modern Approach, Prentice Hall India, 2012.
2. Elaine Rich, Kevin Knight and Shivashankar B Nair, Artificial Intelligence, Tata McGraw Hill, 2010.
3. M. Tim Jones, Artificial Intelligence: A Systems Approach, Jones and Bartlett Publisher, 2010.
4. Winston, Patrick Henry, Artificial Intelligence, Addison Wesley, 2008

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

1. Anthony T.Velte , Toby J. Velte Robert Elsenpeter, —Cloud Computing - A practical approach, Tata McGraw- Hill , New Delhi, 2010.
2. Rittinghouse John W, Ransome James F, —Cloud Computing-Implementation, Management and Security, CRC Press, Taylor and Francis Group, 2012.
3. Michael Miller, Cloud Computing, —Web-Based Applications that Change the Way You Work and Collaborate Online, Que Publishing, 2008.
4. Kumar Saurabh, —Cloud Computing, Wiley India Pvt. Ltd, Second Edition, 2012.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

L T P C

3 0 0 3

JD581E05 NETWORK ENGINEERING AND MANAGEMENT

Course Objectives

1. To understand the concepts of computer networks and to study the functions of different layers. To analyze the different protocols and network components.
2. To understand the implementation of network management protocol.

Course Outcomes (COs)

1. Analyze the requirements of modern communication network.
2. Exemplify the process of network management.
3. Explain the network management protocol model and its versions.
4. Describe procedure remote monitoring and telecommunication network management.
5. Understand the broadband network and its services.

UNIT I FOUNDATIONS OF NETWORKING

9Data communication networks – Protocols and standards –OSI model –Layers in OSI –TCP/IP protocol suite – Error detection and correction – Flow control – Error control.

Unit II DATA LINK LAYER AND NETWORK LAYER 9

SONET architecture –Layers – Frames – STS multiplexing –SONET networks – Frame relay- ATM-ATM LAN – AAL- IPv4 Address – IPv6 address –Internetworking – Transition from IPv4 to IPv6 –Address mapping – ICMP– IGMP – ICMPv6 –Congestion control.

Unit III SNMPv1, SNMPv2 and SNMPv3 9

SNMPv1 Communication model -Functional model-SNMPv2 system architecture-Structure of management information-Management information base -SNMP v2 protocol - Compatibility with SNMPv1-SNMPv3 key features-Documentation architecture-Applications-MIB-Security- Interoperability.

UNIT IV RMON AND TELECOMMUNICATION NETWORK MANAGEMENT 9

Remote monitoring - RMON SMI and MIB - RMON1 - RMON2- Remote monitoring - TMN - TMN conceptual model -TMN architecture - TMN management service architecture – TMN integrated view.

UNIT V BROADBAND NETWORK MANAGEMENT 9

Broadband networks and services, ATM Technology-VP,VC, ATM Packet, Integrated service, ATMLAN emulation, virtual LAN. ATM network management-ATM network reference model, integrated local management Interface. ATM management information base, Role of SNMD and ILMI in ATM.

Total :45 Hours

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

REFERENCE BOOKS:

1. Behrouz A. Forouzan, Data Communication and Networking. New Delhi: Tata McGraw Hill, 2010
2. Mani Subramaniam , Network Management Principles and practices. New Delhi:
3. Pearson Education,2010
4. Larry L. Peterson and Bruce S. Davie, Computer Networks: A Systems Approach. Noida: Morgan Kaufman Publishers, 2012.
5. William Stallings, SNMP, SNMPv2, SNMPv3 and RMON1 and RMON2. NewDelhi: Pearson Education,2002.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

L T P C

3 0 0 3

JD581E06

NATURAL LANGUAGE PROCESSING

Course Objectives:

1. To provide an introduction to the central issues of Natural Language Processing (NLP) in relation to linguistics and statistics.
2. To understand the fundamentals of parsing and semantics.
3. To recognize the methods used for question answering and summarization techniques.

Course Outcomes (COs)

1. Attain fundamental knowledge in natural language processing.
2. Describe the methods for morphological analysis.
3. Familiarize with techniques used for speech recognition.
4. Acquire knowledge on linguistic information using parsing techniques.
5. Gain comprehensive knowledge in question answering and summarization techniques.

UNIT I INTRODUCTION

9

Knowledge in speech and language processing – Ambiguity – Models and algorithms – Language, Thought and understanding – History of NLP.

UNIT II WORDS

9

Regular expressions and automata – Words and transducers: Finite-state transducers – FSTs for morphological parsing - Human morphological processing– N- Grams– Word classes and part of speech tagging: Part-of-speech tagging –Hidden markov model - Maximum entropy models.

UNIT III SPEECH

9

Phonetics: Speech sounds and phonetic transcription – Articulatory phonetics– Speech synthesis: Text normalization– Phonetic analysis – Prosodic analysis – Automatic speech recognition: Speech recognition architecture – Applying the hidden markov model to speech – Computational phonology: Syllabification – Learning phonology and morphology.

UNIT IV SYNTAX, SEMANTICS AND PRAGMATICS

9

Formal grammars of English: Grammar rules – Tree banks - Parsing with context-free grammars: Dynamic programming parsing methods– Statistical parsing – Features and unification: Feature structures – Unification of feature structures – Computational semantics: Syntax driven semantic analysis – Lexical semantics: Word net-Primitive decomposition-Metaphor.

UNIT V APPLICATIONS

9

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

Question answering and summarization: Information retrieval – Factoid question answering – Summarization – Multi-document Summarization – Summarization evaluation. Dialogue and on sensational Agents Properties of human conversations – Basic dialogue systems – Voice XML – Dialogue system design and evaluation.

TOTAL: 45 Hours

REFERENCE BOOKS:

1. Daniel Jurafsky and James H. martin, Speech and Language Processing, Second Edition, Pearson Higher Education, 2009.
2. Daniel Bikel and ImedZitouni, Multilingual Natural Language Processing Applications: From Theory to Practice, IBM Press, 2012.
3. David A. Grossman and OphirFedier, Information Retrieval: Algorithms and Heuristics (The Information Retrieval Series), Springer, 2004.
4. Michael W Berry, Survey of Text mining I: Clustering, Classification and Retrieval, Copyrighted material, Springer, 2013.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

JD581E07 AD-HOC AND SENSOR NETWORKS

Course Objective (COs)

1. Learn about the issues in the design of wireless ad hoc networks
2. Understand the working of protocols in different layers of mobile ad hoc and sensor networks
3. Understand security issues in ad hoc and sensor networks.

Course Outcomes (COs)

1. Explain the concepts, network architectures ad hoc and wireless networks
2. Understand and analyze routing protocols for ad hoc with respect to protocol design issues
3. Know the concepts, applications and MAC protocols in wireless sensor network.
4. Recognize design challenges with communication protocols and localization protocols in WSN.
5. Understand various security practices and protocols of Ad-hoc and Sensor Networks

UNIT I AD HOC WIRELESS NETWORKS AND MAC

9

Fundamentals of WLAN's – IEEE 802.11 architecture - Self configuration and auto configuration -Issues in ad-Hoc wireless networks – MAC protocols for Ad-Hoc wireless networks – Contention based protocols - TCP over ad-hoc networks-TCP protocol overview - TCP and MANET's – Solutions for TCP over ad-hoc networks

UNIT II ADHOC ROUTING PROTOCOLS AND MANAGEMENT

9

Routing in ad-hoc networks- Introduction -Topology based versus position based approaches - Proactive, reactive, hybrid routing approach - Principles and issues – Location services - DREAM–Quorums based location service – Grid forwarding strategies – Greedy packet forwarding – Restricted directional flooding- Hierarchical routing- Other routing protocols.

UNIT III WIRELESS SENSOR NETWORKS FUNDAMENTALS AND MAC 9

Introduction –WSN applications-Factors influencing WSN design-MAC challenges- Protocols- Contention based- S-MAC-B-MAC-CC-MAC- Other contention based MAC protocols- Reservation based mechanism-TRAMA-Other reservation based mechanism-Hybrid mechanism- Zebra-MAC.

UNIT IV WSN ROUTING PROTOCOLS AND LOCALIZATION

9

Challenges for routing- Data-centric and Flat-architecture protocols- Flooding- Gossiping- Sensor SPIN - Directed diffusion-Hierarchical protocols: LEACH - PEGASIS - TEEN and

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

L T P C

3 0 0 3

APTEEN- Geographical routing protocols- QoS-based protocols-Localization in WSN- Ranging techniques- Range-Based localization protocols- Range-free localization protocols

UNIT V ADHOC AND SENSOR NETWORK SECURITY

9

Security in ad-hoc and sensor networks – Key distribution and management – Software based anti-tamper techniques – Water marking techniques – Defense against routing attacks - Secure ad- hoc routing protocols – Sensor network security protocols – SPINS- Integrating MANETs, WLANs and cellular networks – Heterogeneous architecture – Mobile user stations

TOTAL: 45 Hours

REFERENCE BOOKS:

1. C.Siva Ram Murthy and B.S.Manoj, Ad Hoc Wireless Networks – Architectures and Protocols, Pearson Education, 2011
2. Carlos De Moraes Cordeiro, Dharma Prakash Agrawal, Ad-Hoc and Sensor Networks: Theory and Applications, Second Edition, World Scientific Publishing, 2011.
3. Ian F. Akyildiz, Mehmet Can Vuran , Wireless Sensor Network, John Wiley & Sons,2010.
4. Erdal Çayırıcı , Chunming Rong, Security in Wireless Ad Hoc and Sensor Networks, John Wiley and Sons,2009
5. Waltenequs Dargie, Christian Poellabauer, Fundamentals of Wireless Sensor Networks Theory and Practice, John Wiley and Sons, 2010

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

JD581E08 SOFTWARE QUALITY ASSURANCE

Course Objective (COs)

1. To understand software quality assurance activities with tools and techniques.
2. To know the standards and components of software quality assurance
3. To study the metrics for software quality assurance

Course Outcome (COs)

1. Describe the quality management framework and related quality program concepts.
2. Explain commercial standards and the impact on quality assurance.
3. Analyze the relationship of process and product quality assurance (PPQA) to SQA.
4. Understand the quality management in information technology.
5. Exemplify Software quality metrics methodology and software quality control tools.

UNIT I ORGANIZING QUALITY MANAGEMENT 9

Quality management framework - Quality program concepts – Organizational aspects of quality program – Quality program organizational relationship-Mapping quality program functions to project organizational entities.

UNIT II STANDARDS USED IN SOFTWARE QUALITY ASSURANCE 9

Software Quality Assurance (SQA) in ISO standards – SQA in IEEE standards –IEEE std 730- 2002- IEEE std 829-1998- IEEE std 1028-1997-ITIL standards - ANSI/EIA standards and RTLA/DO standards.

UNIT III SOFTWARE QUALITY ASSURANCE 9

Identifying SQA personnel needs – Characteristics of a good SQA engineer – SQA engineering staff – Pareto principle applied to SQA – Software inspections and walkthroughs – Measurements-Transition of cost to quality - Software audit – Performing the audit - Software safety and its relation to SQA – CMMI – PPQA relationship to SQA.

UNIT IV QUALITY MANAGEMENT IN IT 9

ITSM processes – IT best practices – ITSM standards – Process improvement models – Customer requirements – Monitoring and measuring ITSM performance - Procurement quality – IT quality professional – Cost of software quality system – CoSQ system to organization.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

UNIT V SQA METRICS

9

Software quality indicators – PSM – CMMI- PSP and TSP – Six sigma - Seven quality control tools: traditional and modern tools-check sheet - Pareto diagram- Histogram - Run chart- Scatter diagram - Control chart-Integrating Quality Activities in the Project Life Cycle - Reviews - Software Testing – Strategies - Software Testing –Implementation.

TOTAL: 45 Hours

REFERENCE BOOKS:

1. Schulmeyer G. Gordon, Handbook of Software Quality Assurance. London: Artech House Inc, 2008.
2. Daniel Galin, Software Quality Assurance from theory to implementation, Pearson Education Limited, 2009.
3. Milind Limaye. Software Quality Assurance, Tata McGraw-Hill Education, 2011
4. Stephen H. Kan. Metrics and Models in Software Quality Engineering, Addison-Wesley Professional, 2003.
5. Murali Chemuturi, Mastering Software Quality Assurance: Best Practices, Tools and Techniques for Software Developers, J. Ross Publishing Inc, 2011.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

JD581A01 RESEARCH METHODOLOGY AND IPR

Course Objectives:

1. To understand some basic concepts of engineering research and its methodologies.
2. To identify various sources of information for literature review and data collection.
3. To families the various procedures to formulate appropriate research problem and design of experiments.

Course Outcomes:

1. Understand research problem formulation.
2. Analyze research related information
3. Follow research ethics
4. Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
5. Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.

UNIT I

Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations

UNIT II

Effective literature studies approaches, analysis-Plagiarism, Research ethics,

UNIT III

Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

Unit IV

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants Model Curriculum of Engineering & Technology PG Courses of patents, Patenting under PCT.

Unit V

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Semester

**L T P C
3 0 0 3**

information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

TOTAL : 45

REFERENCE BOOKS:

1. Stuart Melville and Wayne Goddard, “Research methodology: an introduction for science & engineering students”
2. Wayne Goddard and Stuart Melville, “Research Methodology: An Introduction”
3. Ranjit Kumar, 2 ndEdition , “Research Methodology: A Step by Step Guide for beginners”
4. Halbert, “Resisting Intellectual Property”, Taylor & Francis Ltd ,2007.
5. Mayall , “Industrial Design”, McGraw Hill, 1992.
6. Niebel , “Product Design”, McGraw Hill, 1974.
7. Asimov , “Introduction to Design”, Prentice Hall, 1962.
8. Robert P. Merges, Peter S. Menell, Mark A. Lemley, “ Intellectual Property in New Technological Age”, 2016.
9. T. Ramappa, “Intellectual Property Rights Under WTO”, S. Chand, 2008

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Sem

L T P C

0 0 4 2

JD581L2

ADVANCED OPERATING SYSTEMS LABORATORY

Course Objectives

1. To familiarize the students with the Operating System.
2. To demonstrate the process, memory, file and directory management issues under the UNIX/ LINUX operating system
3. To introduce LINUX basic commands
4. To make students how to make simple programs in Android

Course Outcomes (COs)

1. Implement and demonstrate the fundamentals of Operating Systems
2. Implement the concepts of distributed operating system
3. Implement Memory management concepts
4. Implement mobile applications

List of Experiments

1. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
2. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
3. Write programs to simulate UNIX commands like ls, grep, etc.
4. Write programs to implement various scheduling policies.
5. Develop Application using Inter Process communication (using shared memory, pipes or message queues.
6. Implement the Producer – Consumer problem using semaphores (using UNIX system calls)
7. Implement memory management schemes.
8. Implement distributed mutual exclusion algorithms
9. Implement centralized and distributed deadlock detection Algorithms.
10. Implement concurrency control algorithms.
11. Implement simple mobile applications (Antroid)

REFERENCES / MANUALS/SOFTWARE:

- Linux-Operating System, Android
- C / C++ /Java

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – I Sem

**L T P C
0 0 4 2**

JD581L1

DATA STRUCTURES LABORATORY

Course Objectives

1. To impart the basic concepts of data structures and algorithms
2. To understand concepts about searching and sorting techniques
3. To Understand basic concepts about stacks, queues, lists, trees and graphs
4. To understand concepts Traveling Salesman Problem

Course Outcomes:

1. Design and implement elementary data structures
2. Design and implement advanced data structures
3. Choose appropriate algorithm design technique and solve problems
4. Implement Graph and other important algorithms

LIST OF EXPERIMENTS /EXERCISES

1. Implement Heap Sort and Quick Sort.
2. Implement Binary Search Trees
3. Implement Red-Black trees
4. Implement Binomial Heap and Fibonacci heaps.
5. Implement Strassen's matrix multiplication algorithm using divide and conquer technique
6. Implement Greedy algorithm for Huffman code
7. Implement String Matching algorithms
8. Implement Graph algorithms.
9. Implement algorithm for Traveling Salesman Problem.
10. Implement algorithm for sum of Subset Problem.

TOTAL : 45

REFERENCES / MANUALS / SOFTWARE:

- Windows-Operating System
- Java, C++

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

L T P C

3 0 0 3

JD581C03

ADVANCED DATABASE TECHNOLOGY

Course Objectives

1. To learn the data models and to conceptualize a database system using ER diagrams.
2. To know the concepts of parallel and distributed databases.
3. To understand the enhanced data model
4. To gain knowledge about the emerging database technologies.
5. To understand object relational model

Course Outcomes (COs)

1. Understand the basic database system concepts.
2. Design parallel and distributed databases.
3. Apply the object oriented concepts in databases.
4. Implement the active, temporal and deductive databases.
5. Know the mobile database concepts.

Unit I Database System Concepts

10

File systems - Database systems - Database architecture - Data models: Relational model - Entity- relationship model: Constraints - Removing redundant attributes in entity sets- Entity-relationship diagrams - Reduction to relational schemas - Entity-relationship design issue- Extended E-R features - Alternative notations for modeling - Data normalization and database design: First normal form, second normal form, third normal form- Boyce codd normal form.

Unit II Parallel and Distributed Databases

7

Parallel databases: I/O parallelism – Inter and intra query parallelism – Inter and intra operation parallelism – Distributed database concepts - Distributed data storage – Distributed transactions – Commit protocols – Concurrency control – Distributed query processing

Unit III Object and Object Relational Databases

8

Concepts for object databases: Object identity – Object structure – Type constructors – Encapsulation of operations– Methods – Persistence – Type and class hierarchies – Inheritance – Complex objects – Object database standards, languages and design: ODMG model – ODL – OQL – Object relational and extended – Relational systems: Object relational features in SQL / Oracle.

Unit IV Enhanced Data Models

11

Active database concepts and triggers – Temporal databases – Spatial databases – Multimedia databases– Deductive databases – XML databases: XML data model – DTD - XML schema - XML querying - Geographic information systems-Genome data management.

Unit V Emerging Technologies

9

Mobile Database system- Location and handoff management – Effect of mobility on data management – Location dependent data distribution –Execution Model based on ACID Transaction Framework-Pre-write transaction execution model-Mobile transaction models - Concurrency control - Information retrieval.

Total: 45 Hours

REFERENCE BOOKS:

1. R. Elmasri, and S. B. Navathe, Fundamentals of Database Systems. New Delhi: Pearson Education/Addison Wesley, 2015.
2. Henry F. Korth, Abraham Silberschatz, and S. Sudharshan, Database System Concepts. New Delhi: McGraw Hill, 2010.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

3. Vijay Kumar, Mobile Database Systems Wiley Series on Parallel and Distributed Computing, USA, Wiley-Interscience, 2006.
4. Thomas Cannolly and Carolyn Begg, Database Systems, A Practical Approach to Design, Implementation and Management. New Delhi: Pearson Education, 2014.
5. Raghu Ramakrishnan and Johannes Gehrke, Database Management Systems. New Delhi: McGraw Hill, 2007.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

L T P C

3 0 0 3

JD581C04

NETWORK PROGRAMMING

Course Objectives:

1. To understand to Linux utilities
2. To understand file handling, signals
3. To understand IPC, network programming in Java
4. To learn the kernel concepts
5. To understand processes to communicate with each other across a Computer Network.

Course Outcomes (COs)

1. Apply the knowledge in Linux shell programming
2. Understand the file directory and management
3. Apply the knowledge in kernel signal
4. Write web applications using a combination of client-side and server-side technologies
5. Able to write TCP and UDP socket programs in java.

UNIT – I

9

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

9

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 locking-lock 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

9

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.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

UNIT – IV

9

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, Client-Server 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

9

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.

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)

REFERENCE BOOKS:

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.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

JD581E09 ADVANCED COMMUNICATION NETWORKS

Course Objectives

1. To understand the wired, wireless LANs and backbone networks
2. To learn internetworking and end to end protocol
3. To gain in-depth knowledge about the routing protocols
4. To interpret congestion control and traffic management
5. To understand the ATM network concepts

Course Outcomes (COs)

1. Identify and understand the requirements to choose the appropriate network structure for real time issues.
2. Analyze the functionalities and modes of operation of protocols in the network architecture.
3. Understand the process of flow control mechanisms to fulfill networking requirements in wired and wireless technology.
4. Describe the concept of high speed networking and to create optimal systems.
5. Acquire knowledge of protocols for routing of information across the network

UNIT I

9

Review of Networking Concepts:

Traffic characterization and quality of service, network services, high-performance networks, – Implementing network software – Layered architecture, Open data network model, performance - Reliable transmission – Ethernet and multiple access network (802.3) – Wireless - 802.11/Wi-Fi - bluetooth/802.15.1 - Cell phone technologies

UNIT II

8

Internetworking and End to End Protocol

Switching and bridging – Datagrams - Virtual circuit switching - Source routing - Bridges and LAN switches – Basic internetworking (IP) - Service model - Global addresses - Datagram forwarding in IP - Subnetting and classless addressing - Address translation - Host configuration - Error reporting - Virtual networks and tunnels – Simple demultiplexer (UDP) -Reliable byte stream (TCP) – Remote procedure call (RPC).

UNIT III

10

Congestion and Traffic Management

Effects of congestion – Traffic management – Congestion control in packet - Switching networks Frame relay congestion control – Need for flow and error control – Link control mechanisms – ARQ performance – TCP flow and congestion control - Traffic control.

UNIT IV

10

ATM Network

ATM network, features, addressing, signaling, routing, ATM header structure, ATM adaptation layer (AAL), management and control, BISDN, internetworking with ATM. Optical networks, WDM systems, cross connects, optical LAN, optical paths and networks.

Unit V

8

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

Internet Routing

Overview of graph theory and Least - cost paths – Interior routing protocols – Internet routing principles – Distance vector and link state protocol – Exterior routing protocols: BGP and IDRP multicasting.

REFERENCE BOOKS:

1. Larry L. Peterson and Bruce S. Davie, *Computer Networks: A Systems Approach*, Morgan Kaufmann, 2012.
2. William Stallings, *High - Speed Networks and Internets: Performance and Quality of Service*, Pearson Education, 2010.
3. Andrew S. Tanenbaum and David J. Wetherall, *Computer Networks*, Pearson Education, 2011.
4. Behrouz Forouzan, *Data communications and Networking*, Tata Mc Graw Hill Education, 2009.
5. James F. Kurose and Keith W. Ross, *Computer Networking: A Top - Down Approach*, Pearson Education, 2013.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

JD581E10 SOFTWARE PROCESS AND PROJECT MANAGEMENT

Course Objectives:

1. To describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
2. To understand the workflows
3. To learn the cost estimations and schedule
4. To compare and differentiate organization structures and project structures.
5. To implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

Course Outcomes (COs)

1. Describe software process maturity framework.
2. Explain conventional software management and software economics.
3. Discuss software projects and project planning.
4. Analyze project tracking and control.
5. Assess the role of project closure analysis.

UNIT I

9

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

9

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

9

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

9

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, metrics automation.

UNIT V

9

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

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

Total:45 Hours

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 Management, 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.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

JD581E11 HIGH SPEED NETWORKS

Course Objectives:

1. To learn an introduction about ATM and Frame relay.
2. To provide with an up-to-date survey of developments in High Speed Networks.
3. To write the congestion control algorithm
4. To enable the students to know techniques involved to support real-time traffic and congestion control.
5. To provide with different levels of quality of service (Q.S) to different applications.

Course Outcomes:

1. Develop an in-depth understanding, in terms of architecture, protocols and applications, of major high-speed networking technologies
2. Solve numerical or analytical problems pertaining to the high-speed networking technologies
3. Design and configure a network to support a specified set of applications.
4. Develop necessary background to manage projects involving any of the high-speed networking technologies

UNIT – I

9

High Speed Networks : Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, ATM logical Connection, ATM Cell – ATM Service Categories – AAL- High Speed LANs: Fast Ethernet, Gigabit Ethernet, Fibre Channel – Wireless LANs: applications, requirements – Architecture of 802.11

UNIT – II

9

Congestion and Traffic Management: Queuing Analysis- Queuing Models – Single Server Queues – Multi server queues-Effects of congestion – Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT – III

9

TCP and ATM Congestion Control : TCP Flow control – TCP Congestion Control – Retransmission Timer Management – Exponential RTO backoff – KARNs Algorithm – Window management – Performance of TCP over ATM - Traffic and Congestion control in ATM – Requirements – Attributes - Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats, ABR Capacity allocations – GFR traffic management

UNIT – IV

9

Integrated and Differentiated Services : Services- Integrated Services Architecture – Approach, Components, Services- Queuing Discipline, FQ, PS, BRFQ, GPS, WFQ – Random Early Detection, Differentiated Services

UNIT – V

9

Protocols for QoS Support : RSVP – Goals and Characteristics, Data Flow, RSVP operations, Protocol Mechanisms – Multiprotocol Label Switching – Operations, Label Stacking, Protocol details – RTP – Protocol Architecture, Data Transfer Protocol, RTCP

TOTAL 45

REFERENCE BOOKS:

1. Stallings William, —High Speed Networks and Internetl, Second Edition, Pearson Education, NewDelhi, 2002.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

2. Walrand and Pravin Varaiya, —High Performance Communication Networks, Second Edition, Jean Harcourt Asia Pvt. Ltd., 2001.
3. Pepelnjak Irvan, Guichard Jim and Apcar Jeff, —MPLS and VPN Architecture, Cisco Press, Volume 1 and 2, 2003
4. <http://pages.cpsc.ucalgary.ca/~carey/CPSC641/archive/Sept2005/>

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

L T P C

3 0 0 3

JD581E12

SOFT COMPUTING

Course Objectives

1. To recognize the feasibility of applying a soft computing methodology for a particular problem
2. To gain knowledge in Neural networks
3. To understand the Neuro fuzzy modelling
4. To understand the fuzzy sets, fuzzy logic and optimization technique
5. To know the genetic algorithm fundamentals

Course Outcomes (COs)

1. Acquire knowledge in the fundamentals of Neuro-Fuzzy and Fuzzy sets
2. Describe the Fuzzy Inference Systems and Optimization
3. Understand the concepts of Neural Networks
4. Explain the basic principles of Neuro-Fuzzy Modeling
5. Know the fundamentals of genetic algorithm

Unit I

9

Introduction to Neuro-Fuzzy, Fuzzy sets

Introduction - Soft computing constituents and conventional Artificial intelligence – Neuro-Fuzzy and soft computing characteristics. Fuzzy sets: Definitions – Set-theoretic Operations. Fuzzy Rules, Reasoning: Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules.

Unit II

9

Fuzzy Inference Systems and Optimization

Fuzzy inference systems: Mamdani fuzzy models – Sugeno fuzzy models – Tsukamoto fuzzy models – Input Space partitioning and Fuzzy modeling. Derivative-based optimization: Descent methods – Method of steepest descent – Newton’s methods – Step size determination. derivative - Free optimization: Simulated annealing – Random search.

Unit III

9

Neural Networks

Adaptive networks – Back propagation for feed forward networks – Batch Learning - Pattern by pattern Learning. Supervised learning neural networks: Perceptrons – Adaline - Radial basis function networks. Unsupervised learning neural networks: Competitive learning network – Kohonen self organising networks – Learning vector quantization - Hebbian learning.

Unit IV

9

Neuro-Fuzzy Modeling

Adaptive neuro-fuzzy Inference systems: Introduction – ANFIS architecture - Hybrid learning algorithm. Classification and regression trees: Decision trees – CART algorithm for tree induction. Data clustering algorithms: K-means clustering – Fuzzy C-means clustering – Mountain clustering – Subtractive clustering.

Unit V

9

Genetic Algorithm

Fundamentals of genetic algorithm – History – Basic concepts – Creation of off springs – Working principal – Encoding – Fitness function – Reproduction. Genetic modelling:

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

Inheritance operators – Cross over – Inversion and Deletion – Mutation operator – Bitwise operators - Generational cycle – Convergence of genetic algorithm.

Total :45 Hours

REFERENCE BOOKS:

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun and Eiji Mizutani, *Neuro-Fuzzy and Soft Computing: A Computational Approach to Learning and Machine Intelligence*, New Delhi: Prentice-Hall of India, 2010.
2. S.Rajasekaran and G.A.V.Pai, *Neural Networks, Fuzzy Logic And Genetic Algorithms*, PHI, 2003.
3. David E. Goldberg, *Genetic Algorithms in Search, Optimization and Machine Learning*, Singapore: Addison Wesley, 2001.
4. S.N.Sivanandan and S.N. Deepa, *Principles of Soft Computing*, Wiley India, 2007. ISBN: 10: 81-265 -1075-7.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

UNIT V SECURING STORAGE AND STORAGE VIRTUALIZATION 9

Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes.

TOTAL :45 Hours

REFERENCES:

1. EMC Corporation, "Information Storage and Management: Storing, Managing, and Protecting Digital Information", Wiley, India, 2010
2. Marc Farley, —Building Storage Networks, Tata McGraw Hill ,Osborne, 2001.
3. Robert Spalding, —Storage Networks: The Complete Reference—, Tata McGraw Hill , Osborne, 2003.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

JD581E14

SOCIAL NETWORK ANALYSIS

Course Objectives:

1. To understand the semantic web and social networks.
2. To learn to social network applications.
3. To learn the Evaluation of web-based social network extraction.
4. To understand the social media mining
5. To design the social network infrastructure

Course Outcomes (COs)

On completion of the course the students will be able to

1. apply knowledge for current web development in the era of Social Web
2. model, aggregate and represent knowledge for Semantic Web
3. design extraction and mining tools for Social networks
4. develop personalized web sites and visualization for Social networks

UNIT – I

9

Introduction to the semantic web and social networks: Limitations of the current Web – The Semantic Solution – Development of the Semantic Web - The emergence of the social web – Discussion-Development of Social Network Analysis – Key concepts and measures in network analysis.

UNIT – II

9

Web data and semantics in social network applications: Electronic discussion networks – Blogs and online communities – Web- based Networks- Ontologies and their role in the Semantic Web - Ontology languages for the Semantic Web-State-of-the-art in network data representation – Ontological representation of social relationships – Aggregating and reasoning with social network area- Building semantic web application with social network features – Flink: the social networks of the Semantic web community – open academia: distributed, semantic- based publication management

UNIT – III

9

Evaluation of web-based social network extraction : Differences between survey methods and electronic data extraction – Context of the empirical study – Data collection- Preparing the data – Optimizing goodness of fit – Comparison across method and networks – Predicting the goodness of fit – Evaluation through analysis- Semantic-based social network analysis in the sciences - Ontologies - emergent semantics in folksonomy systems.

UNIT – IV

9

Social media mining and search: Discovering Mobile Social Networks by Semantic Technologies – Online Identities and Social Networking – Detecting Communities in Social Networks – Concept of Discovery in Youtube.com using Factorization method – Mining Regional Representative Photos from Consumer – Generated Geotagged Photos – Collaborating Filtering Based on Choosing a Different Number of Neighbors for Each User – Discovering Communities from Social Networks : Methodologies and Applications.

UNIT – V

9

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

L T P C

3 0 0 3

Social network infrastructures and communities: Decentralized Online Social Networks – Multi- Relational Characterization of Dynamic Social Networks Communities, Privacy in online social networks: Managing Trust in Online Social Networks – Security and Privacy in Online Social Networks – Investigation of Key-Player Problem in Terrorist Network Using Bayes Conditional Probability – Optimizing Targeting of Intrusion Detection System in Social Networks – Security Requirements for Social Networks in Web 2.0- visualization and applications of social networks

TOTAL : 45 Hours

REFERENCE BOOKS:

1. Peter Mika, "Social networks and the semantic web", Springer publishers, 200
2. Borko Furht, "Handbook of Social Network Technologies and Applications", Springer publishers, 2010
3. Guandong Xu , Yanchun Zhang and Lin Li, —Web Mining and Social Networking Techniques and applications, Springer, 1st edition, 2011.
4. Dion Goh and Schubert Foo, —Social information retrieval systems: emerging technologies and applications for searching the Web effectively, IGI Global snippet, 2008.
5. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, —Collaborative and Social Information Retrieval and Access: Techniques for Improved User Modelling, IGI Global snippet, 2009.
6. John G. Breslin, Alexandre Passant and Stefan Decker, —The Social Semantic Web, Springer, 2009.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

L T P C

3 0 0 3

JD581E15

DIGITAL IMAGE PROCESSING

Course Objectives:

1. To understand the basic concept and elements of digital image processing
2. To learn the Classification of Image Processing operations
3. To learn the Image Restoration
4. To apply the knowledge in image compression
5. To apply the knowledge in image representation

Course Outcomes:

On completion of the course the students will be able to

1. understand digital image processing fundamentals, sampling and quantization concepts for 2D images
2. apply image processing techniques in both the spatial and frequency domains using various transform techniques
3. develop simple algorithms for smoothing, sharpening and segmentation of 2D images
4. use various image processing techniques for real time applications

UNIT – I

9

Introduction: Elements of Digital Image processing-Elements of visual perception: light – luminance – brightness, contrast, hue, saturation, mach band effect– simultaneous contrast. Two dimensional sampling theory. 2D Image Transforms: DFT, DCT, Hadamard, Haar, Walsh, KL and SVD.

UNIT – II

9

Classification of Image Processing operations: Arithmetic operations – Logical operations- Geometrical operations – Interpolation techniques Image Enhancement: Image quality and need for enhancement – Image enhancement point operations: Linear and non-linear functions – piecewise linear functions – Histogram based techniques. Spatial Filtering: Image smoothing spatial filters – Image sharpening spatial filters.

UNIT – III

9

Image Restoration: Image restoration model – Noise modeling- Image restoration in the presence of noise only: Mean filters – Order-statistics filters. Image restoration techniques: Constrained method – Unconstrained method: Wiener filter – Inverse Filter Image Segmentation: Edge detection – Types of edge detectors - Segmentation based on thresholding-Region based: Region growing-Region splitting and merging.

UNIT – IV

9

Image Morphology: Need for morphological processing – Morphological operators – Hit or Miss Transform –Basic morphological algorithms : Boundary extraction – Noise removal – Thinning – Thickening – Skeletonization

Image Compression: Need for Compression- Run length encoding-Huffman coding-Arithmetic coding – Predictive Coding -Transform based compression-Vector quantization-Block truncation coding- Wavelet based image compression

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

UNIT – V

9

Image Representation: Representation: chain codes – polynomial approximations – signatures – boundary descriptors – Regional descriptors: Texture regional descriptor. Colour Image Processing: Light and color- Colour formation: Additive and subtractive, colour models-RGB, HIS and its conversions-Histogram equalization- Colour image segmentation.

TOTAL : 45

REFERENCE BOOKS:

1. Gonzalez, Rafael C. and Woods, Richard E., —Digital Image Processing‡, Second Edition, Prentice Hall, New York, 2006.
2. Jain, Anil K., —Fundamentals of Digital Image Processing‡, Prentice Hall of India, New Delhi, 2003

ridhar, — Digital Image Processing —, Oxford University Press,
Newdelhi,2011. 4.Jayaraman. S, Esakkirajan. S, and Veerakumar. T,
—Digital Image Processing‡ Tata McGraw- Hill, New Delhi 1st ed 2009 .

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

**L T P C
3 0 0 3**

JD581E16 DATA MINING TECHNIQUES

Course Objectives:

1. To understand the major data mining issues
2. To Study the major data mining problems as different types of computational tasks (prediction, classification, clustering, etc.)
3. To learn the pattern mining
4. To learn the data preprocessing
5. To understand the application and social impacts of data mining

Course Outcomes:

On completion of the course the students will be able to

1. describe the different data mining and preprocessing techniques
2. ability to explain data visualization
3. categorize the association rule mining and classification methods
4. summarize different clustering and outlier methods used in data mining
5. apply the concepts of data mining in real world problems

UNIT – I 9

Introduction: Data Mining-Steps in Knowledge Discovery Process- Kinds of Data and Patterns – Technologies used-Targeted applications - Major issues in Data Mining - Data objects and attribute types - Statistical descriptions of data - Data Visualization- Measuring data similarity and dissimilarity

UNIT – II 9

Data Preprocessing: Data Cleaning, Integration, Reduction, Transformation and Discretization, Mining Frequent Patterns - Frequent Itemset Mining Methods- Pattern Evaluation Methods-Mining in Multilevel and Multidimensional Space - Constraint based Frequent Pattern Mining

UNIT- III 9

Classification: Decision Tree Induction-Bayesian Classification-Rule based classification- Classification by Back Propagation – Support Vector Machines – Lazy Learners –Model Evaluation and Selection- Techniques to improve Classification Accuracy - k-Nearest Neighbor Classifier

UNIT- IV 9

Clusters Analysis: Partitioning Methods – Hierarchical Methods – Density based Methods – Grid based Methods - Evaluation of Clustering – Outliers and Outlier analysis - Outlier detection Methods - Statistical Approaches

UNIT- V 9

Applications: Mining Complex data types - Statistical Data Mining - Data Mining foundations - Visual and Audio Data Mining – Applications - Ubiquitous and invisible Data Mining - Social impacts of Data Mining.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

L T P C
3 0 0 3
TOTAL : 45

REFERENCE BOOKS:

1. Han Jiawei, and Kamber Micheline, "Data Mining: Concepts and Techniques", Third Edition, Morgan Kaufmann Publishers, 2012.
2. Berson Alex, and Smith Stephen J., —Data Warehousing, Data Mining and OLAP, Tata Mcgraw- Hill, New Delhi, 2004.
3. Gupta G.K., —Introduction to Data Mining with Case Studies, Prentice Hall India, New Delhi, 2006.
4. Ian.H.Witten, Eibe Frank and Mark.A.Hall, —Data Mining: Practical Machine Learning Tools and Techniques, Third Edition, Morgan Kaufmann, 2011

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

L T P C

0 0 4 2

JD581L3

ADVANCED DATABASE TECHNOLOGY LABORATORY

Course Objectives

1. To study and implement the basic SQL commands.
2. To implement the database design in PL/SQL.
3. To design normal forms
4. To learn the locks and partition operations
5. To implement PL/SQL programs and database connectivity

Course Outcomes (COs)

1. Understand the basic SQL commands.
2. Develop procedures, functions in SQL.
3. Develop packages in SQL
4. Create a cursors and Triggers
5. Develop applications using PL/SQL

List of Experiments

1. Working basic SQL commands (DDL, DML, DCL, and TCL).
2. Executing Single Row and Group functions.
3. Running SQL queries on Join and Integrity constraints.
4. Implementation of Synonyms, Sequences, Views and Indexes.
5. Design a database using first and second normal form.
6. Perform the Locks & Partitions operations.
7. Simple programs using PL/SQL blocks.
8. Apply the concepts of Exception handling in PL/SQL block.
9. Create Cursors and Triggers.
10. Use the concept of Procedures and Function in PL/SQL block.
11. Use the concept of package in PL/SQL block
12. Develop a banking system to maintain its customer details using PL/SQL programming. Mini Project

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE – I Year – II Sem

L T P C

0 0 4 2

JD581L4 NETWORK PROGRAMMING LABORATORY

Course Objectives

1. To understand the network equipments
2. To implement LAN using routers
3. To configure the LAN and DHCP server
4. To configure packet analyzer and
5. To learn network management tools

Course Outcomes:

On completion of the course the students will be able to

1. Configure switches, routers and firewalls
2. Create LAN, VLAN and Multi-router topology
3. Configure the Firewall
4. Analyze the data traffic inside and outside of a router using a network management tool
5. Configuring open source based packet analyzer.

LIST OF EXPERIMENTS /EXERCISES

1. Switches configuration – Managed and Unmanaged switches.
2. Establishing a Local Area Network (LAN).
3. VLAN Creation, adding resources and configuration.
4. DHCP Server Configuration.
5. Connecting two LANs using multi-router topology with static routes.
6. Defining access control lists and integrating centralized authentication server.
7. Firewall configuration.
8. Installing and configuring open source based packet analyzer and network management tools.

TOTAL : 45

REQUIREMENTS HARDWARE / SOFTWARE:

- Hardware Components: Switches, Routers, Computers
- OS: Linux/Windows
- Packet Analyzer and Network Management Tools

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

JD581E16 SOFTWARE QUALITY ASSURANCE AND TESTING

Course Objectives

1. To understand the basics of testing, test planning & design and test team organization
2. To study the various types of test in the life cycle of the software product.
3. To build design concepts for system testing and execution
4. To learn the software quality assurance ,metrics, defect prevention techniques
5. To learn the techniques for quality assurance and applying for applications.

Course Outcomes (COs)

1. Perform functional and nonfunctional tests in the life cycle of the software product.
2. Understand system testing and test execution process.
3. Identify defect prevention techniques and software quality assurance metrics.
4. Apply techniques of quality assurance for typical applications.

UNIT I SOFTWARE TESTING- CONCEPTS, ISSUES, AND TECHNIQUES 9

Quality Revolution, Verification and Validation, Failure, Error, Fault, and Defect, Objectives of Testing, Testing Activities, Test Case Selection White-Box and Black ,test Planning and design, Test Tools and Automation, . Power of Test. Test Team Organization and Management-Test Groups, Software Quality Assurance Group ,System Test Team Hierarchy, Team Building.

UNIT II SYSTEM TESTING 9

System Testing - System Integration Techniques-Incremental, Top Down Bottom Up Sandwich and Big Bang, Software and Hardware Integration, Hardware Design Verification Tests, Hardware and Software Compatibility Matrix Test Plan for System Integration. Built-in Testing. functional testing - Testing a Function in Context. Boundary Value Analysis, Decision Tables. acceptance testing - Selection of Acceptance Criteria, Acceptance Test Plan, Test Execution Test. software reliability - Fault and Failure, Factors Influencing Software, Reliability Models .

UNIT III SYSTEM TEST CATEGORIES 10

System test categories Taxonomy of System Tests, Interface Tests Functionality Tests. GUI Tests, Security Tests Feature Tests, Robustness Tests, Boundary Value Tests Power Cycling Tests Interoperability Tests, Scalability Tests, Stress Tests, Load and Stability Tests, Reliability Tests, Regression Tests, Regulatory Tests. Test Generation from FSM models-State-Oriented Model. Finite-State Machine Transition Tour Method, Testing with State Verification. Test Architectures-Local, distributed, Coordinated, Remote.system test design-Test Design Factors Requirement Identification, modeling a Test Design Process Test Design Preparedness, Metrics, Test Case Design Effectiveness. system test execution-Modeling Defects, Metrics for Monitoring Test Execution .Defect Reports, Defect Causal Analysis, Beta testing, measuring Test Effectiveness.

UNIT IV SOFTWARE QUALITY 8

Software quality - People's Quality Expectations, Frameworks and ISO-9126, McCall's Quality Factors and Criteria – Relationship. Quality Metrics. Quality Characteristics ISO 9000:2000 Software Quality Standard. Maturity models- Test Process Improvement ,Testing Maturity Model.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

UNIT V SOFTWARE QUALITY ASSURANCE

9

Quality Assurance - Root Cause Analysis, modeling, technologies, standards and methodologies for defect prevention. Fault Tolerance and Failure Containment - Safety Assurance and Damage Control, Hazard analysis using fault-trees and event-trees. Comparing Quality Assurance Techniques and Activities. QA Monitoring and Measurement, Risk Identification for Quantifiable Quality Improvement. Case Study: FSM-Based Testing of Web-Based Applications.

Total: 45 Hours

REFERENCE BOOKS:

1. Software Testing And Quality Assurance-Theory and Practice, Kshirasagar Nak Priyadarshi Tripathy, John Wiley & Sons Inc,2008
2. Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement, Jeff Tian, John Wiley & Sons, Inc., Hoboken, New Jersey. 2005.
3. Software Quality Assurance - From Theory to Implementation, Daniel Galin, Pearson Education Ltd UK, 2004
4. Software Quality Assurance, Milind Limaye, TMH ,New Delhi, 2011

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

JD581E17 EMBEDDED SOFTWARE DEVELOPMENT

Course Objectives

1. To understand the architecture of embedded processor, microcontroller and peripheral devices.
2. To interface memory and peripherals with embedded systems.
3. To study the embedded network environment.
4. To understand challenges in Real time operating systems.
5. To study, analyze and design applications on embedded systems..

Course Outcomes (COs)

1. Understand different architectures of embedded processor, microcontroller and peripheral devices. Interface memory and peripherals with embedded systems.
2. Work with embedded network environment.
3. Understand challenges in Real time operating systems.
4. Design and analyze applications on embedded systems.

UNIT I EMBEDDED PROCESSORS 9

Embedded Computers - Characteristics of Embedded Computing Applications - Challenges in Embedded Computing System Design - Embedded System Design Process- Formalism for System Design - Structural Description - Behavioural Description - ARM Processor - Intel ATOM Processor.

UNIT II EMBEDDED COMPUTING PLATFORM 9

CPU Bus Configuration - Memory Devices and Interfacing - Input/Output Devices and Interfacing -System Design - Development and Debugging – Emulator – Simulator - JTAG Design Example – Alarm Clock - Analysis and Optimization of Performance - Power and Program Size.

UNIT III EMBEDDED NETWORK ENVIRONMENT 9

Distributed Embedded Architecture - Hardware And Software Architectures - Networks for Embedded Systems - I2C - CAN Bus - SHARC Link Supports – Ethernet – Myrinet – Internet - Network-based Design - Communication Analysis - System Performance Analysis - Hardware Platform Design - Allocation and Scheduling - Design Example - Elevator Controller.

UNIT IV REAL-TIME CHARACTERISTICS 9

Clock Driven Approach - Weighted Round Robin Approach - Priority Driven Approach - Dynamic versus Static Systems - Effective Release Times and Deadlines - Optimality of the Earliest Deadline First (EDF) Algorithm - Challenges in Validating Timing Constraints in Priority Driven Systems - Off-Line versus On-Line Scheduling.

UNIT V SYSTEM DESIGN TECHNIQUES 9

Design Methodologies - Requirement Analysis – Specification - System Analysis and Architecture Design - Quality Assurance - Design Examples - Telephone PBX - Ink jet printer - Personal Digital Assistants - Set-Top Boxes.

Total: 45 Hours

REFERENCE BOOKS:

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

1. Adrian McEwen, Hakim Cassimally, "Designing the Internet of Things" Wiley Publication, First edition, 2013
2. Andrew N Sloss, D. Symes, C. Wright, | Arm system developers guidel, Morgan Kauffman/Elsevier, 2006.
3. ArshdeepBahga, Vijay Madiseti, " Internet of Things: A Hands-on-Approach" VPT First Edition, 2014
4. C. M. Krishna and K. G. Shin, —Real-Time Systemsll , McGraw-Hill, 1997
5. Frank Vahid and Tony Givargis, —Embedded System Design: A Unified Hardware/Software Introductionll, John Wiley & Sons.
6. Jane.W.S. Liu, —Real-Time systemsll, Pearson Education Asia.
7. Michael J. Pont, —Embedded Cl, Pearson Education , 2007.
8. Muhammad Ali Mazidi , SarmadNaimi , SepehrNaimi, "TheAVR Microcontroller and Embedded Systems: Using Assembly and C" Pearson Education, First edition, 2014
9. Steve Heath, —Embedded SystemDesignll , Elsevier, 2005
10. Wayne Wolf, —Computers as Components:Principles of Embedded Computer System Designll, Elsevier, 2006.

JD581E18 MOBILE APPLICATION DEVELOPMENT

Course Objectives

1. Understand system requirements for mobile applications.
2. Generate suitable design using specific mobile development frameworks.
3. Generate mobile application design.
4. Implement the design using specific mobile development frameworks.
5. Deploy the mobile applications in marketplace for distribution.

Course Outcomes (COs)

1. Describe the requirements for mobile applications.
2. Explain the challenges in mobile application design and development.
3. Develop design for mobile applications for specific requirements.
4. Implement the design using Android SDK.
5. Implement the design using Objective C and iOS.

UNIT I INTRODUCTION

5

Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications – Requirements gathering and validation for mobile applications.

UNIT II BASIC DESIGN

8

Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – User interfaces for mobile applications – touch events and gestures – Achieving quality constraints – performance, usability, security, availability and modifiability.

UNIT III ADVANCED DESIGN

8

Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

UNIT IV ANDROID

12

Introduction – Establishing the development environment – Android architecture – Activities and views – Interacting with UI – Persisting data using SQLite – Packaging and deployment – Interaction with server side applications – Using Google Maps, GPS and Wifi – Integration with social media applications.

UNIT V IOS

12

Introduction to Objective C – iOS features – UI implementation – Touch frameworks – Data persistence using Core Data and SQLite – Location aware applications using Core Location and Map Kit – Integrating calendar and address book with social media application – Using Wifi - iPhone marketplace.

Total: 45 Hours

REFERENCE BOOKS:

- 1 .Charlie Collins, Michael Galpin and Matthias Kappler, —Android in PracticeI, DreamTech, 2012.
- 2 David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, —Beginning iOS 6 Development: Exploring the iOS SDKI, Apress, 2013.
- 3 <http://developer.android.com/develop/index.html>.
- 4 James Dovey and Ash Furrow, —Beginning Objective CI, Apress, 2012.
- 5 Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012.
- 6 Reto Meier, —PProfessional android DevelopmentI, Wiley-India Edition, 2012.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

JD581E19

INTERNET AND WEB TECHNOLOGY

Course Objectives

1. To understand the client / server programming
2. To apply web programming languages for developing web applications
3. To know the unique features of scripting languages

Course Outcomes (COs)

1. Design web pages using HTML and CSS
2. Develop web pages using java script
3. Describe server side programming techniques in web technology
4. Understand the concept of JSP
5. Know the basics concept of web services

UNIT I WEB ESSENTIALS

9

Internet – Web clients – Web servers – Markup languages – Introduction to XHTML-Editing XHTML-Headings-Linking –Tables-Images-Forms-Internal linking – Frames - Lists- Cascading Style Sheets (CSS): Features-Style rule cascading and inheritance - Text properties –CSS box model.

UNIT II CLIENT SIDE PROGRAMMING

9

Client side vs. Server side programming languages - Introduction to java script –Control statements I - Control statements II - Functions- Objects – Arrays – Build-in objects - DOM: History and levels- Document tree-DOM event handling-Non compliant browsers.

UNIT III SERVER SIDE PROGRAMMING

9

Java servlet: Architecture – Servlet life cycle -Simple programs using java servlet–Parameter data – Sessions – Cookies – Other servlet capabilities –Data storage –Servlet and concurrency- JDBC- Connecting a java servlet program to a database

UNIT IV REPRESENTING WEB DATA

9

XML documents and vocabularies-Versions and declarations-Namespaces-DTD and XML schema-XML parsers: DOM vs. SAX-XSLT – Xquery - XPath- Separating programming and presentation: Introduction to java server pages– JSP and servlets – Running JSP applications - Basic JSP – Java beans classes and JSP - Tag libraries and files.

UNIT V WEB SERVICES

9

Web services concepts - Writing java web services – Web services for clients – WSDL – Representing data types: XML schema – Communicating object data: SOAP related technologies–SOAP encoding of struct data-Software installation-Storing java objects as files-Databases and java Servlets.

INTERNET SECURITY & FIREWALLS

Firewalls: Hardened firewall hosts - IP- Packet Screening- Proxy Application Gateways

Total: 45 Hours

REFERENCE BOOKS:

1. Jeffrey C Jackson, Web Technology – A computer Science perspective, Person Education, New Delhi, 2011.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

2. Chris Bates, Web Programming – Building Internet Applications, Wiley India, 2013.
3. Deitel, Deitel and Neito, INTERNET and WORLD WIDE WEB – How to program, Pearson education, New Delhi, 2011.
4. Gopalan. N.P, Web Technology A Developer Perspectives, PHI, 2010.

Course Objectives

1. To learn the basic concepts of software engineering
2. To understand the usage of UML diagrams
3. To design and test software project

Course Outcomes (COs)

1. Understand the concepts of various UML diagrams
2. Illustrate the software project using effective requirement analysis
3. Describe the object oriented design concepts
4. Test and manage the software project using object oriented software engineering
5. Analyze the configuration management and project management activities

Unit I Introduction to Object Oriented Software Engineering 9

Software engineering concepts -Software engineering development activities - Managing software development - Introduction to UML- Modeling concepts – UML diagrams - Project organizations - Project communication concepts- Organizational activities

Unit II Requirements Elicitation and Analysis 9

An overview of requirements elicitation – Requirements elicitation concepts - Requirements elicitation activities - Managing requirements elicitation - Analysis overview – Concepts of analysis - Activities: from use cases to objects- Managing analysis.

Unit III System Design and Object Design 9

Decomposing the system- An overview of system design - System design concepts - System design activities - From objects to subsystems - Addressing design goals - Managing system design - Object design - Reusing pattern solutions - Reuse concepts - Solution objects – Inheritance - Design patterns - Reuse activities - Managing reuse.

Unit IV Testing and Managing Changes 9

Testing concepts - Testing activities - Component inspection- Managing testing - Rationale management - Rationale concepts - Rationale activities - From issues to decisions - Managing rationale heuristics for communicating about rationale - Issue modeling and negotiation - Conflict resolution strategies.

Unit V Configuration Management and Project Management 9

Configuration management concepts - Configuration management activities –Managing configuration management - Project management - Project management concepts - Classical project management activities - Agile project management activities.

TOTAL: 45 PERIODS

Reference(s)

1. Bernd Bruegge, Allen H., Object-Oriented Software Engineering: Using UML, Patterns and Java, Pearson Education, 2011
2. Timothy C. Lethbridge and Robert Laganriere, Object -Oriented Software Engineering: Practical software development using UML and Java, McGraw-Hill Higher Education 2013
3. Sommerville, Software Engineering, Pearson Education, 2009.

Course Objectives

1. To understand the concept of patterns and the Catalog.
2. To discuss the Presentation tier design patterns and their affect on: sessions, client access, validation and consistency.
3. To understand the variety of implemented bad practices related to the Business and Integration tiers.
4. To highlight the evolution of patterns.

Course Outcomes (COs)

1. Gain a basic appreciation of Embedded system design
2. Explain the concept of embedded systems, its hardware and its software
3. Demonstrate the concepts of real time operating systems
4. Explore programming concepts and embedded programming in C and C++
5. Describe real time operating systems and inter-task MicroC/OS-II RTOS

UNIT I

9

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

9

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

9

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

9

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 RTOS, RTOS VxWorks, Windows CE

UNIT V

9

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,

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

Simulation and Debugging Techniques and Tools: Testing on Host Machine, Simulators, Laboratory Tools

TOTAL: 45 PERIODS

REFERENCE BOOKS:

1. Embedded Systems, Raj Kamal, Second Edition TMH.
2. Embedded/Real-Time Systems, Dr.K.V.K.K.Prasad, dreamTech press
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.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

**L T P C
3 0 0 3**

Course Objectives

1. To understand the concept of patterns and the Catalog.
2. To discuss the Presentation tier design patterns and their affect on: sessions, client access, validation and consistency.
3. To understand the variety of implemented bad practices related to the Business and Integration tiers.

Course Outcomes (COs)

1. To highlight the evolution of patterns.
2. To how to add functionality to designs while minimizing complexity To understand what design patterns really are, and are not
3. To learn about specific design patterns.
4. To learn how to use design patterns to keep code quality high without overdesign.

UNIT I Envisioning Architecture

9

The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views.

Creating an Architecture Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT II Analyzing Architectures

9

Architecture Evaluation, Architecture design decision making, ATAM, CBAM. Moving from one system to many Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT III Patterns

9

Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage. Creational and Structural patterns Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight.

UNIT IV Behavioral patterns

9

Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

UNIT V Case Studies

9

A-7E – A case study in utilizing architectural structures, The World Wide Web - a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development.

TOTAL: 45 PERIODS

REFERENCE BOOKS:

1. Software Architecture in Practice, second edition, Len Bass, Paul Clements & Rick Kazman, Pearson Education, 2003.
2. Design Patterns, Erich Gamma, Pearson Education, 1995.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

3. Software Design, David Budgen, second edition, Pearson education, 2003
4. Head First Design patterns, Eric Freeman & Elisabeth Freeman, O'REILLY, 2007.
5. Design Patterns in Java, Steven John Metsker & William C. Wake, Pearson education, 2006
6. J2EE Patterns, Deepak Alur, John Crupi & Dan Malks, Pearson education, 2003.
7. Design Patterns in C#, Steven John metsker, Pearson education, 2004.
8. Pattern Oriented Software Architecture, F.Buschmann & others, John Wiley & Sons.

PARALLEL AND DISTRIBUTED ALGORITHMS

Course Objectives

1. To learn parallel and distributed algorithms development techniques for shared memory and message passing models.
2. To study the main classes of parallel algorithms.
3. To study the complexity and correctness models for parallel algorithms.

Course Outcomes (COs)

1. To Gain the Basic Techniques of Parallel Computers
2. Explore the concepts of Message Passing Technique
3. To learn computing platform and pipeline programs
4. To learn about Synchronous Computations concepts
5. Learn about Distributed shared memory.

UNIT-I

Basic Techniques, Parallel Computers for increase Computation speed, Parallel & Cluster Computing

9

UNIT-II

Message Passing Technique- Evaluating Parallel programs and debugging, Portioning and Divide and Conquer strategies examples

9

UNIT-III

Pipelining- Techniques computing platform, pipeline programs examples

9

UNIT-IV

Synchronous Computations, load balancing, distributed termination examples, programming with shared memory, shared memory multiprocessor constructs for specifying parallel list sharing data parallel programming languages and constructs, open MP

9

UNIT-V

Distributed shared memory systems and programming achieving constant memory distributed shared memory programming primitives, algorithms – sorting and numerical algorithms.

9

TOTAL: 45 PERIODS

REFERENCE BOOK:

1. Parallel Programming, Barry Wilkinson, Michael Allen, Pearson Education, 2nd Edition.
2. Introduction to Parallel algorithms by Jaja from Pearson, 1992.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

AUDIT 1 and 2: ENGLISH FOR RESEARCH PAPER WRITING

Course objectives:		
Students will be able to:		
<ol style="list-style-type: none"> 1. Understand that how to improve your writing skills and level of readability 2. Learn about what to write in each section 3. Understand the skills needed when writing a Title 		
Ensure the good quality of paper at very first-time submission		
Syllabus		
Units	CONTENTS	Hours
1	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness	4
2	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction	4
3	Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.	4
4	key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature,	4
5	skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions	4
6	useful phrases, how to ensure paper is as good as it could possibly be the first-time submission	4

Suggested Studies:

1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books)
2. Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press
3. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman's book.
4. Adrian Wallwork, English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

AUDIT 1 and 2: DISASTER MANAGEMENT

Course Objectives: -Students will be able to:		
1. learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.		
2. critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.		
3. develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.		
4. critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in		
Syllabus		
Units	CONTENTS	Hours
1	Introduction Disaster: Definition, Factors And Significance; Difference Between Hazard And Disaster; Natural And Manmade Disasters: Difference, Nature, Types And Magnitude.	4
2	Repercussions Of Disasters And Hazards: Economic Damage, Loss Of Human And Animal Life, Destruction Of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.	4
3	Disaster Prone Areas In India Study Of Seismic Zones; Areas Prone To Floods And Droughts, Landslides And Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics	4
4	Disaster Preparedness And Management Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies, Media Reports: Governmental And Community Preparedness.	4
5	Risk Assessment Disaster Risk: Concept And Elements, Disaster Risk Reduction, Global And National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation In Risk Assessment And Warning, People’s Participation In Risk Assessment. Strategies for Survival.	4
6	Disaster Mitigation Meaning, Concept And Strategies Of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation And Non-Structural Mitigation, Programs Of Disaster Mitigation In India.	4

SUGGESTED READINGS:

1. R. Nishith, Singh AK, “Disaster Management in India: Perspectives, issues and strategies “New Royal book Company.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

2. Sahni, Pardeep Et.Al. (Eds.),” Disaster Mitigation Experiences And Reflections”, Prentice Hall Of India, New Delhi.
3. Goel S. L. , Disaster Administration And Management Text And Case Studies” ,Deep &Deep Publication Pvt. Ltd., New Delhi.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

AUDIT 1 and 2: SANSKRIT FOR TECHNICAL KNOWLEDGE

Course Objectives

1. To get a working knowledge in illustrious Sanskrit, the scientific language in the world
2. Learning of Sanskrit to improve brain functioning
3. Learning of Sanskrit to develop the logic in mathematics, science & other subjects
4. enhancing the memory power
5. The engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient literature

Syllabus

Unit	Content	Hours
1	<ul style="list-style-type: none">• Alphabets in Sanskrit,• Past/Present/Future Tense,• Simple Sentences	8
2	<ul style="list-style-type: none">• Order• Introduction of roots• Technical information about Sanskrit Literature	8
3	<ul style="list-style-type: none">• Technical concepts of Engineering-Electrical, Mechanical, Architecture, Mathematics	8

Suggested reading

1. “Abhyaspustakam” – Dr.Vishwas, Samskrita-Bharti Publication, New Delhi
2. “Teach Yourself Sanskrit” Prathama Deeksha-Vempati Kutumbshastri, Rashtriya Sanskrit Sansthanam, New Delhi Publication
3. “India’s Glorious Scientific Tradition” Suresh Soni, Ocean books (P) Ltd., New Delhi.

Course Output

Students will be able to

1. Understanding basic Sanskrit language
2. Ancient Sanskrit literature about science & technology can be understood
3. Being a logical language will help to develop logic in students

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

AUDIT 1 and 2: VALUE EDUCATION

Course Objectives

Students will be able to

1. Understand value of education and self- development
2. Imbibe good values in students
3. Let the should know about the importance of character

Syllabus

Unit	Content	Hours
1	<ul style="list-style-type: none"> • Values and self-development –Social values and individual attitudes. Work ethics, Indian vision of humanism. • Moral and non- moral valuation. Standards and principles. • Value judgements 	4
2	<ul style="list-style-type: none"> • Importance of cultivation of values. • Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. • Honesty, Humanity. Power of faith, National Unity. • Patriotism.Love for nature ,Discipline 	6
3	<ul style="list-style-type: none"> • Personality and Behavior Development - Soul and Scientific attitude. Positive Thinking. Integrity and discipline. • Punctuality, Love and Kindness. • Avoid fault Thinking. • Free from anger, Dignity of labour. • Universal brotherhood and religious tolerance. • True friendship. • Happiness Vs suffering, love for truth. • Aware of self-destructive habits. • Association and Cooperation. • Doing best for saving nature 	6
4	<ul style="list-style-type: none"> • Character and Competence –Holy books vs Blind faith. • Self-management and Good health. • Science of reincarnation. • Equality, Nonviolence ,Humility, Role of Women. • All religions and same message. • Mind your Mind, Self-control. • Honesty, Studying effectively 	6

Suggested reading

1. Chakroborty, S.K. “Values and Ethics for organizations Theory and practice”, Oxford University Press, New Delhi

Course outcomes

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

Students will be able to

1. Knowledge of self-development
2. Learn the importance of Human values
3. Developing the overall personality

AUDIT 1 and 2: CONSTITUTION OF INDIA

Course Objectives:

Students will be able to:

1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
2. To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
3. To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

Syllabus

Units	Content	Hours
1	<ul style="list-style-type: none"> • History of Making of the Indian Constitution: History Drafting Committee, (Composition & Working) 	4
2	<ul style="list-style-type: none"> • Philosophy of the Indian Constitution: Preamble Salient Features 	4
3	<ul style="list-style-type: none"> □ Contours of Constitutional Rights & Duties: □ Fundamental Rights □ Right to Equality □ Right to Freedom □ Right against Exploitation □ Right to Freedom of Religion □ Cultural and Educational Rights □ Right to Constitutional Remedies □ Directive Principles of State Policy □ Fundamental Duties. 	4

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

4	<ul style="list-style-type: none"> <input type="checkbox"/> Organs of Governance: <input type="checkbox"/> Parliament <input type="checkbox"/> Composition <input type="checkbox"/> Qualifications and Disqualifications <input type="checkbox"/> Powers and Functions • Executive <input type="checkbox"/> President <input type="checkbox"/> Governor <input type="checkbox"/> Council of Ministers <input type="checkbox"/> Judiciary, Appointment and Transfer of Judges, Qualifications <input type="checkbox"/> Powers and Functions 	4
5	<ul style="list-style-type: none"> <input type="checkbox"/> Local Administration: • District's Administration head: Role and Importance, <input type="checkbox"/> Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. <input type="checkbox"/> Pachayati raj: Introduction, PRI: Zila Pachayat. <input type="checkbox"/> Elected officials and their roles, CEO Zila Pachayat: Position and role. <input type="checkbox"/> Block level: Organizational Hierarchy (Different departments), <input type="checkbox"/> Village level: Role of Elected and Appointed officials, 	4
	<ul style="list-style-type: none"> • Importance of grass root democracy 	
6	<ul style="list-style-type: none"> <input type="checkbox"/> Election Commission: <input type="checkbox"/> Election Commission: Role and Functioning. <input type="checkbox"/> Chief Election Commissioner and Election Commissioners. <input type="checkbox"/> State Election Commission: Role and Functioning. <input type="checkbox"/> Institute and Bodies for the welfare of SC/ST/OBC and women. 	4

Suggested reading

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

Course Outcomes:

Students will be able to:

1. Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
2. Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
3. Discuss the circumstances surrounding the foundation of the Congress

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.

4. Discuss the passage of the Hindu Code Bill of 1956.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

AUDIT 1 and 2: PEDAGOGY STUDIES

Course Objectives:		
Students will be able to:		
<ul style="list-style-type: none"> 4. Review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers. 5. Identify critical evidence gaps to guide the development. 		
Syllabus		
Units	Content	Hours
1	<ul style="list-style-type: none"> <input type="checkbox"/> Introduction and Methodology: <input type="checkbox"/> Aims and rationale, Policy background, Conceptual framework and terminology <input type="checkbox"/> Theories of learning, Curriculum, Teacher education. <input type="checkbox"/> Conceptual framework, Research questions. <input type="checkbox"/> Overview of methodology and Searching. 	4
2	<ul style="list-style-type: none"> • Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. • Curriculum, Teacher education. 	2
3	<ul style="list-style-type: none"> • Evidence on the effectiveness of pedagogical practices 	4
	<ul style="list-style-type: none"> • Methodology for the in depth stage: quality assessment of included studies. • How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? • Theory of change. • Strength and nature of the body of evidence for effective pedagogical practices. • Pedagogic theory and pedagogical approaches. • Teachers’ attitudes and beliefs and Pedagogic strategies. 	
4	<ul style="list-style-type: none"> • Professional development: alignment with classroom practices and follow-up support • Peer support • Support from the head teacher and the community. • Curriculum and assessment • Barriers to learning: limited resources and large class sizes 	4

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

5	<input type="checkbox"/> Research gaps and future directions <input type="checkbox"/> Research design <input type="checkbox"/> Contexts <input type="checkbox"/> Pedagogy <input type="checkbox"/> Teacher education <input type="checkbox"/> Curriculum and assessment <input type="checkbox"/> Dissemination and research impact.	2
----------	--	---

Suggested reading

1. Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, *Compare*, 31 (2): 245-261.
2. Agrawal M (2004) Curricular reform in schools: The importance of evaluation, *Journal of Curriculum Studies*, 36 (3): 361-379.
3. Akyeampong K (2003) Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER) country report 1. London: DFID.
4. Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? *International Journal Educational Development*, 33 (3): 272–282.
5. Alexander RJ (2001) *Culture and pedagogy: International comparisons in primary education*. Oxford and Boston: Blackwell.
6. Chavan M (2003) Read India: A mass scale, rapid, 'learning to read' campaign.
7. www.pratham.org/images/resource%20working%20paper%202.pdf.

Course Outcomes:

Students will be able to understand:

1. What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
2. What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
3. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C

3 0 0 3

AUDIT 1 and 2: STRESS MANAGEMENT BY YOGA

Course Objectives

1. To achieve overall health of body and mind
2. To overcome stress

Syllabus

Unit	Content	Hours
1	<ul style="list-style-type: none">• Definitions of Eight parts of yog. (Ashtanga)	8
2	<ul style="list-style-type: none">• Yam and Niyam. Do's and Don't's in life. i) Ahinsa, satya, astheya, bramhacharya and aparigraha ii) Shaucha, santosh, tapa, swadhyay, ishwarpranidhan	8
3	<ul style="list-style-type: none">• Asan and Pranayam i) Various yog poses and their benefits for mind & body ii)Regularization of breathing techniques and its effects-Types of pranayam	8

Suggested reading

1. 'Yogic Asanas for Group Training-Part-I' : Janardan Swami Yogabhyasi Mandal, Nagpur
2. "Rajayoga or conquering the Internal Nature" by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata

Course Outcomes:

Students will be able to:

1. Develop healthy mind in a healthy body thus improving social health also
2. Improve efficiency

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

**AUDIT 1 and 2: PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT
SKILLS**

Course Objectives

1. To learn to achieve the highest goal happily
2. To become a person with stable mind, pleasing personality and determination
3. To awaken wisdom in students

Syllabus

Unit	Content	Hours
1	Neetisatakam-Holistic development of personality <ul style="list-style-type: none">• Verses- 19,20,21,22 (wisdom)• Verses- 29,31,32 (pride & heroism)• Verses- 26,28,63,65 (virtue)• Verses- 52,53,59 (dont's)• Verses- 71,73,75,78 (do's)	8
2	<ul style="list-style-type: none">• Approach to day to day work and duties.• Shrimad Bhagwad Geeta : Chapter 2-Verses 41, 47,48,• Chapter 3-Verses 13, 21, 27, 35, Chapter 6-Verses 5,13,17, 23, 35,• Chapter 18-Verses 45, 46, 48.	8
3	<ul style="list-style-type: none">• Statements of basic knowledge.• Shrimad Bhagwad Geeta: Chapter2-Verses 56, 62, 68• Chapter 12 -Verses 13, 14, 15, 16,17, 18• Personality of Role model. Shrimad Bhagwad Geeta: Chapter2-Verses 17, Chapter 3-Verses 36,37,42,• Chapter 4-Verses 18, 38,39• Chapter18 – Verses 37,38,63	8

Suggested reading

1. "Srimad Bhagavad Gita" by Swami Swarupananda Advaita Ashram (Publication Department), Kolkata
2. Bhartrihari's Three Satakam (Niti-sringar-vairagya) by P.Gopinath, Rashtriya Sanskrit Sansthanam, New Delhi.

Course Outcomes

Students will be able to

1. Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
2. The person who has studied Geeta will lead the nation and mankind to peace and prosperity
3. Study of Neetishatakam will help in developing versatile personality of students.

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

L T P C
3 0 0 3

BUSINESS ANALYTICS

L T P C
3 0 0 3

Course Objectives:

1. To introduce analytics as a tool for business decision making
2. To learn multivariate statistical methods to explain or predict the measured values
3. To familiarize the use of project management evaluation techniques
4. To orient the students with research tools

Course Outcomes (COs)

1. Understand the concepts of Descriptive Statistics
2. To gain knowledge about Probability Distribution
3. Describe the Design of Experiments concepts
4. Understand the concepts of Cluster Analysis, Factor Analysis and Discriminate Analysis
5. Analyze the concepts of Foundations of Analytics

Unit- I

9

Descriptive Statistics: Measures of central tendency - Problems on measures of dispersion – Karl Pearson correlation, Spearman’s Rank correlation, simple and multiple regression

Unit -II

9

Probability Distribution: Concept and definition - Rules of probability – Random variables – Concept of probability distribution – Theoretical probability distributions: Binomial, Poisson, Normal and Exponential – Baye’s theorem

Unit- III

9

Decision Theory: Introduction – Steps of decision-making process – types of decision-making Environments – Decision-making under uncertainty – Decision-making under Risk – Decision tree analysis.

Design of Experiments: Introduction – Simple comparative experiments – Single factor Experiments – Introduction to factorial designs

**JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)**

M. Tech-CSE –II Year – I Semester

**L T P C
3 0 0 3**

Unit- IV **9**

Cluster Analysis: Introduction – Visualization techniques – Principal components –
Multidimensional scaling – Hierarchical clustering – Optimization techniques

Factor Analysis: Introduction – Exploratory factor analysis – Confirmatory factor analysis

Discriminant Analysis: Introduction – Linear discriminant analysis

Unit -V **9**

Foundations of Analytics: Introduction – Evolution – Scope – Data for Analytics – Decision
Models – Descriptive, Predictive, Prescriptive – Introduction to data warehousing –
Dashboards and reporting – Master data management.

REFERENCE BOOKS:

1. James R. Evans, Business Analytics – Methods, Models and Decisions, Prentice Hall, 1st edition, 2013, ISBN – 978-0-13-295061-9
2. J K Sharma, Operations Research – Theory & Applications, Macmillan publishers, 5th edition, 2013, ISBN 978-9350-59336-3
3. PurbaHalady Rao, Business Analytics – an application focus, PHI Learning, 2013, ISBN 978-81-203-4819-6
4. N D Vohra, Quantitative Methods, Tata McGraw Hill, 4th Edition, 2010, ISBN 978-0-07-014673-0
5. S C Gupta, Fundamentals of Statistics, Himalaya Publishing House, 6th edition, 2007, ISBN 978-81-8318-755-8