

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR,
ANANTHAPURAMU**
COURSE STRUCTURE FOR DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
M.Tech-CSE-Computer Networks
w.e.f. 2017-18 Admitted Batch onwards

M.Tech I Semester

| S.No | Subject Code | Subject | L | T | P | C |
|-------|--|---|-----------|---|-----------|-----------|
| 1. | 17D08101 | Advanced Data Structures and Algorithms | 4 | - | - | 4 |
| 2. | 17D08102 | Network Programming | 4 | - | - | 4 |
| 3. | 17D08103 | Network Security & Cryptography | 4 | - | - | 4 |
| 4. | 17D25206 17D08104 17D08105 17D08106 | Elective-I a. Internet of Things b. Internals of Operating Systems c. Soft Computing d. High Performance Networks | 4 | - | - | 4 |
| 5. | 17D08107 17D08108 17D25207 17D08109 | Elective-II a. Storage area Networks b. Network Design and Management c. Software Project Management d. Neural Networks | 4 | | - | 4 |
| 6. | 17D08110 | Advanced Data Structures and Algorithms Lab | - | | 4 | 2 |
| 7. | 17D08111 | Network Programming Lab | - | | 4 | 2 |
| 8. | 17D08112 | Network Security Lab | | | 4 | 2 |
| Total | | | 20 | | 12 | 26 |

M.Tech II Semester

| S.No | Subject Code | Subject | L | T | P | C |
|-------|--|---|-----------|---|-----------|-----------|
| 1. | 17D08201 | Mobile Application Development | 4 | - | - | 4 |
| 2. | 17D08202 | Wireless Sensor Networks | 4 | - | - | 4 |
| 3. | 17D08203 | Cloud Computing | 4 | - | - | 4 |
| 4. | 17D08204 17D08205 17D08206 17D25201 | Elective-III a. Digital and Cyber Forensics b. Internet Security Protocols c. Artificial Intelligence d. Advances in Software Testing | 4 | - | - | 4 |
| 5. | 17D08207 17D08208 17D08209 17D25211 | Elective-IV a. Mobile Ad hoc Networks b. Machine Learning c. Embedded Systems d. Secure Software Engineering | 4 | | - | 4 |
| 6. | 17D08210 | Mobile Application Development Lab | - | | 4 | 2 |
| 7. | 17D08211 | Wireless Sensor Networks Lab | - | | 4 | 2 |
| 8. | 17D08212 | MapReduce Programming Lab | | | 4 | 2 |
| Total | | | 20 | | 12 | 26 |

M.Tech III Semester

| S.No | Subject Code | Subject | L | T | P | C |
|-------|----------------------------------|---|-----------|---|---|-----------|
| 1. | 17D20301 17D20302 17D20303 | Elective-V (Open Elective) 1. Research Methodology 2.Human Values & Professional Ethics 3.Intellectual Property Rights | 4 | - | - | 4 |
| 2. | 17D08301 | Elective-VI (MOOCs) | - | - | - | - |
| 3. | 17D08302 | Comprehensive Viva-Voice | - | - | - | 2 |
| 4. | 17D08303 | Seminar | - | - | - | 2 |
| 5. | 17D08304 | Teaching Assignment | - | - | - | 2 |
| 6. | 17D08305 | Project work Phase-I | - | - | - | 4 |
| Total | | | 04 | - | - | 14 |

M.Tech IV Semester

| S.No. | Subject Code | Subject | L | T | P | C |
|-------|--------------|-------------------------|---|---|---|-----------|
| 1. | 17D08401 | Project work Phase - II | - | - | - | 12 |
| Total | | | - | - | - | 12 |

Project Viva Voce Grades:

A: Satisfactory

B: Not Satisfactory

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M.Tech I semester (CN)

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(17D08101) ADVANCED DATA STRUCTURES AND ALGORITHMS

UNIT I : Overview of Data Structures - Arrays, Stacks, Queues, linked lists , Linked stacks and Linked queues, Applications

Algorithm Analysis - Efficiency of algorithms, Asymptotic Notations, Time complexity of an algorithm using O notation, Polynomial Vs Exponential Algorithms, Average, Best, and Worst Case Complexities, Analyzing Recursive Programs.

UNIT II: Trees and Graphs – Basics of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded binary trees, Graphs, representation and traversals.

Binary Search Trees, AVL Trees and B Trees - Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications. B Trees: Definition, Operations and applications.

UNIT III: Red – Black Trees, Splay Trees and Hash Tables - Red–Black Trees, Splay Trees and their applications, Hash Tables, Hash Functions and various applications, File Organizations.

UNIT IV: Divide – and – Conquer & Greedy Method - General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen’s Matrix Multiplication, Greedy Method- General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

Back Tracking and Branch – and – Bound - General Method, 8 – Queen’s Problem, Graph Coloring. Branch – and – Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem.

UNIT V: Dynamic Programming - General Method, All Pairs Shortest Path, Single Source Shortest Path, 0 / 1 Knapsack problem, Reliability Design, Traveling Sales Person’s Problem.

Text Books:

1. Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press.

References:

1. Data Structures and Algorithms Using C++ by Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education, 2010.
2. Classic Data Structures by D. Samanta, 2005, PHI
3. Data Structures and Algorithms by G.A.V. Pai, 2009, TMH.
4. Design and Analysis of Computer Algorithms by Aho, Hopcraft, Ullman 1998, PEA.
5. Introduction to the Design and Analysis of Algorithms by Goodman, Hedetniemi, TMG
6. Design and Analysis of Algorithms by E. Horowitz, S. Sahani, 3rd Edition, Galgotia.
7. Data Structures and Algorithms in C++ by Drozdek 2nd Edition, Thomson.

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(17D08102) NETWORK PROGRAMMING

UNIT I

Introduction: Day Time Client/Server, Concurrent Client/Server, Error Handling, Protocol Independence, Port Numbers.

Sockets: Address structures, value – result arguments, Byte ordering and manipulation function and related functions, Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers, Close and related function.

UNIT II

TCP Client Server: Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT III

I/O Multiplexing and socket options: I/O Models, Select function, Batch input, shutdown function, Poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option, IPV6 socket option, ICMPV6 socket option, IPV6 socket option and TCP socket options.

UNIT IV

Elementary UDP sockets: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

Elementary name and Address conversions: Domain Name System, gethostbyname function, RES_USE_INET6 Resolver option, gethostbyname2 function and IPv6 support, gethostbyaddr function, uname function, gethostname function, getservbyname and getservbyport functions.

UNIT V

IPv4 and IPv6 interoperability: IPv4 client, IPv6 server, IPv6 client, IPv4 server .

Network Management and Debugging: Troubleshooting a Network, ping, traceroute, netstat, Packet Sniffers, Network Management Protocols, SNMP.

Text Book:

1. R. W. Stevens, B. Fenner, A. M. Rudoff, *Unix Network Programming: The Sockets Networking API*, 3rd edition, vol.1, PHI, 2010.
2. E. Nemeth, G. Snyder, T. R. Hein, B. Whaley, *UNIX and Linux System Administration Handbook 4th Edition*, Pearson Education 2011.

Reference Books:

1. A.S. Tanenbaum; *Computer Networks*, 5th edition, Pearson, 2012 (Reference Book).
2. B.A. Forouzan, *Data Communications and Networking*, 4th edition, Tata McGraw Hill, 2006 (Reference Book).

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M.Tech I semester (CN)

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(17D08103) NETWORK SECURITY & CRYPTOGRAPHY

UNIT I

Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services And Security Mechanisms, Classical Encryption Techniques- Symmetric Cipher Model, Substitution Ciphers, Transposition Ciphers, Steganography, Modern Block Ciphers, Modern Stream Ciphers.

Modern Block Ciphers: Block Ciphers Principles, Data Encryption Standard (DES), Linear And Differential Cryptanalysis, Block Cipher Modes Of Operations, AES.

UNIT II

Public-Key Cryptography :Principles Of Public-Key Cryptography, RSA Algorithm, Diffie-Hellman Key Exchange, Elgamal Cryptographic System, Elliptic Curve Arithmetic, Elliptic Curve Cryptography

Cryptographic Hash Functions: Applications Of Cryptographic Hash Functions, Requirements And Security, Hash Functions Based On Cipher Block Chaining, Secure Hash Algorithm (SHA).

UNIT III

Message Authentication Codes: Message Authentication Requirements, Message Authentication Functions, Requirements For Message Authentication Codes, Security Of Macs, HMAC, Macs Based On Block Ciphers, Authenticated Encryption.

Digital Signatures and Authentication Protocols: Digital Signatures, Authentication Protocols.

UNIT IV

Key Management And Distribution: Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key Distribution Using Asymmetric, Distribution Of Public Keys, X.509 Certificates, Public Key Infrastructure.

Electronic Mail Security: Pretty Good Privacy (PGP), S/MIME

UNIT V

Security At The Transport Layer(SSL And TLS) : SSL Architecture, Four Protocols, SSL Message Formats, Transport Layer Security, HTTPS, SSH

Security At The Network Layer (Ipsec): Two Modes, Two Security Protocols, Security Association, Security Policy, Internet Key Exchange.

Intruders: Intruders, Intrusion Detection, Password Management, Firewalls, Viruses and Worms.

Text Books :

1. Cryptography and Network Security: Principals and Practice, William Stallings, Fifth Edition, Pearson Education.
2. Cryptography and Network Security, Behrouz A. Frouzan and Debdeep Mukhopadhyay, 2nd edition, Mc Graw Hill Education

Reference Books :

1. Network Security and Cryptography, Bernard Menezes , Cengage Learning.
2. Cryptography and Security, C.K. Shymala, N. Harini and Dr. T.R. Padmanabhan, Wiley-India.
3. Applied Cryptography, Bruce Schneier, 2nd edition, John Wiley & Sons.
4. Cryptography and Network Security, Atul Kahate, TMH.
5. Introduction to Cryptography, Buchmann, Springer.
6. Number Theory in the Spirit of Ramanujan, Bruce C.Berndt, University Press
7. Introduction to Analytic Number Theory, Tom M.Apostol, University Press

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M.Tech I semester (CN)

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(17D25206) INTERNET OF THINGS

(Elective-I)

UNIT 1

Introduction - Internet of Things – **Design Principles for Connected Devices** – Web Thinking for Connected Devices – **Internet Principles** – IP – TCP – IP Protocol Suite – UDP – IP Address – MAC Address – TCP and UDP Ports – Application Layer Protocols.

UNIT 2

Prototyping – Prototypes and Production – Cloud – Open Source vs Closed Source – Tapping into the Community – **Prototyping Embedded Devices** – Electronics – Embedded Computing Basics – Arduino – Raspberry Pi – Beagle Bone Black – Electronic Imp.

UNIT 3

Prototyping thePhysicalDesign – Laser Cutting – 3D Printing – CNC Milling – Repurposing and Recycling – **Prototyping Online Components** – New API – Real Time Reactions – Other Protocols.

UNIT 4

Techniques for writing Embedded Code – Memory Management – Performance and Battery life – Libraries – Debugging – **Business Models** – Models – Funding an Internet of Things Startup.

UNIT 5

Moving to Manufacture – Designing Kits – Designing Printed Circuit Boards – Manufacturing Printed Circuit Boards – Mass Producing the case and other Fixtures – Scaling up Software – **Ethics** – Characterizing the Internet of Things – Control – Environment – Solutions.

Text Books:

1. Adrian Mcewen and HakinCassimally, “Designing The Internet of Things” Wiley Publications , 2015

Reference Books:

1. Vijay Madiseti and ArshdeepBahga, “Internet of Things (A Hands-on-Approach)”, 1stEdition, VPT, 2014.
2. Francis daCosta, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1st Edition, Apress Publications, 2013
3. CunoPfister, “Getting Started with the Internet of Things”, O’Reilly Media, 2011

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M.Tech I semester (CN)

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(17D25206) INTERNALS OF OPERATING SYSTEM

(Elective-I)

UNIT-I : BUFFER CACHE AND FILE SUB-SYSTEM

Introduction to kernel- Architecture of the UNIX operating system, System Concepts, Data structures.

Buffer Cache: Buffer header, Structure of buffer pool, Reading and writing disk blocks. Files INODES, Structure of a regular file, Directories, Super block, Inode assignment.

UNIT-II : SYSTEM CALLS AND PROCESS SUB-SYSTEM

System calls- OPEN, READ, CLOSE, WRITE, CREATE, CHMOD, CHOWN, Pipes, Mounting and Unmounting. Process Layout the system memory, context, process control, process creation, signals, process scheduling, time, clock.

UNIT-III : INTER PROCESS COMMUNICATIONS

Inter-process communications- Process tracing, System V IPC, Shared Memory, Semaphores. Network Communications- Socket Programming: Sockets, descriptors, connections, socket elements, Stream and datagram sockets.

UNIT-IV : WINDOWS SYSTEM COMPONENTS

Windows Operating System- versions, concepts and tools, Windows internals, System architecture, requirements and design goals, operating system model, architecture overview, key system components. System mechanisms- Trap dispatching, object manager, synchronization, system worker threads, windows global flags, local procedural calls, kernel event tracing.

UNIT-V : REGISTRY AND PROCESS MANAGEMENT

Windows management mechanisms- the registry, registry usage, registry data types, local structure, trouble shooting registry problems, registry internals, services, applications, accounts, service control manager, windows management instrumentation, processes, threads and jobs: Process internals, flow of create process, thread internals, examining thread creation, thread scheduling, job objects.

TEXT BOOKS:

1. Maurice J. Bach, The design of the UNIX operating system, Prentice hall of India,1991
2. Mark E. Russinovich and David A. Solomon, Microsoft Windows Internals, Microsoft Press, 2004.

REFERENCE BOOKS:

1. William Stallings, "Operating Systems: Internals and Design Principles", 5th Edition, Prentice Hall, 2005.

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(17D08105) SOFT COMPUTING

(Elective -I)

Unit - I :

Artificial Intelligence: AI Problems, Techniques, Problem Spaces, Pattern and Data

Search Techniques: Generate and Test, Hill Climbing, Best First Search Problem reduction. Knowledge Representation using Predicate Logic and Rules

Introduction: Hard Computing and Soft Computing.

Characteristics of Neural Networks: Biological Neural Networks and Features, Performance of Computer and Biological Neural Networks

Unit – II:

Artificial Neural Networks: Introduction, Basic models of ANN, important technologies Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Back propagation Network, Associative Memory Networks, Training Algorithms for pattern association, BAM and Hopfield Networks

Unit – III :

Unsupervised Learning Network: Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen-Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks, Special Networks- Introduction of various networks

Unit – IV :

Introduction to Classical Sets (crisp sets) and Fuzzy Sets: operations and Fuzzy sets. Classical Relations and Fuzzy Relations-Cardinality, Operations, Properties and composition, Tolerance and equivalence relations.

Membership functions: Features, Fuzzifications, membership value assignments, Defuzzification

Unit – V :

Fuzzy arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning Fuzzy Decision making and Fuzzy Logic Control System.

Genetic Algorithm: Introduction and basic operators and terminology. Applications: Optimization of TSP, Internet Search Techniques

Text Books :

1. Principles of Soft Computing- S N Sivanandam, S N Deepa, Wiley, India, 2007.
2. Soft Computing and Intelligent System Design- Fakhreddine O Karry, Clarence D Silva, Pearson Edition, 2004.

Reference Books :

1. Artificial Intelligence and SoftComputing- Behavioural and Cognitive Modelling of the Human Brain- Amit Konar, CRC press, Taylor and Francis Group.
2. Artificial Intelligence – Elaine Rich and Kevin Knight, TMH, 1991, rp2008.
3. “Soft Computing” Sameer Roy, Pearson Education,2013.
4. A first course in Fuzzy Logic-Hung T Nguyen and Elbert A Walker, CRC. Press Taylor and Francis Group.
5. Artificial Intelligence and Intelligent Systems, N.P.Padhy, Oxford Univ. Press
6. “Artificial Intelligence and Neural Networks” Umarao, Pearson-Sangune

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M.Tech I semester (CN)

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(17D08106) HIGH PERFORMANCE NETWORKS

UNIT- I

Introduction to computer networks - Review of OSI/ISO model – Introduction to high speed networks - High speed LANs – Fast Ethernet - Switched Fast Ethernet - Gigabit Ethernet – ISDN, FDDI, Frame relay - operations and layers.

UNIT- II

Introduction to SONET – SONET/SDH Layers – SONET Frame Structure – Sonet Physical Layer. Introduction ATM – Cell format and Switching Principles – Protocol Architecture – Service categories. TCP/IP protocol Suite – IP Packet Header – TCP packet header – User services – Protocol Operation – Connection Establishment – UDP.

UNIT- III

Congestion control in Data Networks and Internets – Effects of Congestion – Congestion Control in Packet Switched Networks. Frame relay Congestion Control – Traffic rate Management – Congestion Avoidance. ATM Traffic and Congestion Control – Attributes – Traffic Management Framework – Traffic Control – ABR Traffic Management. TCP Traffic Control – Flow Control – TCP Congestion Control – Timer Management – Window Management.

UNIT-IV

Introduction to Quality of Service - Integrated Services – Differentiated Services – Protocols for QoS support - Resource Reservation (RSVP) – Multiprotocol Label Switching (MPLS) – Real-Time Transport Protocol (RTP).

UNIT- V

Introduction to Optical networks – Wavelength division multiplexing (WDM) – Introduction to broadcast-and-select networks - Switch architectures - channel accessing – Wavelength routed networks – Switch architectures - Routing and wavelength assignment – virtual topology design– IP over SONET over ATM over WDM – IP over ATM over WDM – IP over WDM.

Text Books:

1. William Stallings, "High-Speed Networks and Internets", 2nd Edition, Pearson Education, 2002. (Unit I, II, III, and IV).
2. C. Siva Ram Murthy and Mohan Gurusamy, "WDM Optical Networks: Concepts, Design, and Algorithms", PHI, 2002. (Unit V)

REFERENCE

1. Rajiv Ramaswami and Kumar N. Sivarajan, "Optical Networks: A Practical Perspective", 2nd Edition, Morgan Kaufmann (Elsevier Indian Edition), 2004. (Unit II and V).
2. Laon-Garcia and Widjaja, "Communication Networks: Fundamental Concepts and key Architectures, Tata McGrawHill, 2000.
3. Fred Halsall, "Multimedia Communications: Applications, Protocols, and Standards", Pearson Education Asia, 2001. (Unit I and II)

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M.Tech I semester (CN)

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(17D08107) STORAGE AREA NETWORKS

Elective – II

UNIT I

Basic Networking Concepts and Topologies: OSI Reference Model, Common Network Devices, Network Topologies, MAC Standards - Need for Storage Networks – Storage Devices and Techniques- Evolution and benefits of SANs -SAN Components and Building Blocks- Fibre Channel Basics: Fibre Channel Topologies, Fibre Channel Layers, Classes of Service SAN Topologies

UNIT- II

SANs Fundamentals: SAN Operating Systems Software and Hardware, Types of SAN Technology: Technology and Configuration, High Scalability and Flexibility- Standards- Storage Management Challenges- Networked Storage -Implementation Challenges- Storage Subsystems for Video Services

UNIT III

Storage Networking Architecture- Storage in Storage Networking: Challenges, Cost, Performance -Network in Storage Networking: Fibre Channel, Emerging SAN interconnect Technologies- Basic Software- Advanced Software -Backup Software- Implementation Strategies

UNIT IV

Storage Network Management- In-Band management- Out-of-Band Management- SNMP/HTTP- TELNET -Storage Network Management Issues –Storage Resource Management- Storage Management -Storage, Systems, and Enterprise Management Integration

UNIT V

Designing and building a SAN- Design considerations- Business requirements- Physical layout -Placement -Storage pooling -Data availability- Connectivity- scalability- migration – manageability- fault tolerance and resilience - prevention of congestion- routability- backup and restoration - SAN Security & iSCSI Technology- Basic security guidelines -implementing SAN security -Backup and restoration -iSCSI technology - Future of SANS

Text Books:

1. Storage Area Network Essentials: A complete Guide to Understanding and Implementing SANs (Hard Cover) By Richard Barker, Paul Massigliar By Wiley 2001.

Reference Books:

1. Meeta Gupta, Storage Area Network Fundamentals, Cisco Press, 2002.

2. Marc Farley: Building Storage Networks, 2nd Edition, Tata McGraw Hill, Osborne, 2001.
3. Tom Clark, "Designing Storage Area Networks", Addison-Wesley Professional, 1st edition, 1999
4. Alex Goldman, "Storage Area Networks Fundamentals", Cisco Press 2002

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M.Tech I semester (CN)

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(17D08108) NETWORK DESIGN AND MANAGEMENT
(Elective-II)

UNIT I

Network Design: Design Principles - Determining Requirements - Analyzing the Existing Network - Preparing the Preliminary Design - Completing the Final Design Development - Deploying the Network - Monitoring and Redesigning – Maintaining - Design Documentation - Modular Network Design - Hierarchical Network Design - The Cisco Enterprise Composite Network Model.

UNIT II

Technologies - Switching Design: Switching Types - Layer 2 and 3 Switching - Spanning-Tree Protocol - Redundancy in Layer 2 Switched Networks - STP Terminology and Operation – Virtual LANs – Trunks - Inter-VLAN Routing - Multilayer Switching - Cisco Express Forwarding - Switching Security - Switching Design Considerations - IPv4 Routing Design: IPv4 Address Design - Private and Public Addresses – NAT - Subnet Masks - Hierarchical IP Address Design - IPv4 Routing Protocols – Classification - Metrics - Routing Protocol Comparison - IPv4 Routing Protocol Selection.

UNIT III

Network Security Design: Hacking – Vulnerabilities - Design Issues - Human Issues - Implementation Issues – Threats - Reconnaissance Attacks - Access Attacks – Information Disclosure Attacks - Denial of Service Attacks - Threat Defense - Secure Communication - Network Security Best Practices - SAFE Campus Design.

UNIT IV

Wireless LAN Design: Wireless Technology Overview - Wireless Standards - Wireless Components - Wireless Security - Wireless Security Issues - Wireless Threat Mitigation –Wireless Management - Wireless Design Considerations - Site Survey - WLAN Roaming - Wireless IP Phones - Quality of Service Design - QoS Models – IntServ - DiffServ154 - QoS Tools – Policing and Shaping - Congestion Avoidance - Congestion Management - Link-Specific Tools1 – QoS Design Guidelines.

UNIT V

Network Management Design: ISO Network Management Standard - Protocols and Tools – SNMP – MIB – RMON - Cisco NetFlow – Syslog – CiscoWorks - Network Management Strategy - SLCs and SLAs - IP Service-Level Agreements – Content Networking Design – Case Study – Venti Systems.

TEXT BOOK

1. Diane Tiare and Catherine Paquet, “Campus Network Design Fundamentals”, Pearson Education, 2006.

REFERENCE

1. Craig Zacker, “The Complete Reference: Upgrading and Troubleshooting Networks”,
Tata McGraw-Hill, 2000.

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M.Tech I semester (CN)

L T P C
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(17D25207) SOFTWARE PROJECT MANAGEMENT

(Elective-II)

UNIT I : Project Evaluation And Project Planning

Importance of Software Project Management, Activities Methodologies, Categorization of Software Projects , Setting objectives , Management Principles, Management Control, Project portfolio Management, Cost-benefit evaluation technology, Risk evaluation, Strategic program Management, Stepwise Project Planning.

UNIT II : Project Life Cycle And Effort

Software process and Process Models, Choice of Process models, mental delivery, Rapid Application development, Agile methods, Extreme Programming, SCRUM, Managing interactive processes, Basics of Software estimation, Effort and Cost estimation techniques, COSMIC Full function points, COCOMO II A Parametric Productivity Model, Staffing Pattern.

UNIT III : Activity Planning And Risk Management

Objectives of Activity planning, Project schedules, Activities, Sequencing and scheduling, Network Planning models, Forward Pass & Backward Pass techniques, Critical path (CRM) method, Risk identification, Assessment, Monitoring, PERT technique, Monte Carlo simulation, Resource Allocation, Creation of critical patterns, Cost schedules.

UNIT IV : Project Management And Control

Framework for Management and control, Collection of data Project termination, Visualizing progress, Cost monitoring, Earned Value Analysis- Project tracking, Change control- Software Configuration Management, Managing contracts, Contract Management.

UNIT V : Staffing In Software Projects Managing people, Organizational behavior, Best methods of staff selection, Motivation, The Oldham-Hackman job characteristic model, Ethical and Programmed concerns, Working in teams, Decision making, Team structures, Virtual teams, Communications genres, Communication plans.

Text Books:

1. Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.

References Books:

1. Robert K. Wysocki “Effective Software Project Management” – Wiley Publication,2011.
2. Walker Royce: “Software Project Management”- Addison-Wesley, 1998.
3. Gopaldaswamy Ramesh, “Managing Global Software Projects” – McGraw Hill Education (India), Fourteenth Reprint 2013.

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M.Tech I semester (CN)

L T P C
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(17D08109) NEURAL NETWORKS

(Elective-II)

UNIT – I

BASICS OF ARTIFICIAL NEURAL NETWORKS: Characteristics of Neural Networks, Historical Development of Neural Network Principles, Artificial Neural Networks: Terminology, Models of Neuron, Topology, Basic Learning Laws

UNIT II

ACTIVATION AND SYNAPTIC DYNAMICS: Activation Dynamics Models, Synaptic Dynamics Models, Learning Methods, Stability and Convergence, Recall in Neural Networks.

UNIT III

FUNCTIONAL UNITS OF ANN FOR PATTERN RECOGNITION TASKS: Pattern Recognition Problem, Basic Functional Units, Pattern Recognition Tasks by the Functional Units: Pattern Recognition Tasks by Feed forward Neural Networks, Pattern Recognition Tasks by Feedback Neural Networks, Pattern Recognition Tasks by Competitive Learning Neural Networks.

UNIT IV

FEEDFORWARD NEURAL NETWORKS: Analysis of Pattern Association Networks, Analysis of Pattern Classification Networks, Analysis of Pattern Mapping Networks

UNIT V

FEEDBACK NEURAL NETWORKS: Analysis of Linear Auto associative FF Networks, Analysis of Pattern Storage Networks, Stochastic Networks and Simulated Annealing, Boltzmann Machine

Text Books:

1. “Artificial Neural Networks”, B. Yegnanarayana – PHI Publications

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M.Tech I semester (CN)

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(17D08110) ADVANCED DATA STRUCTURES AND ALGORITHMS LAB

1. Write C++ programs to implement the following using an array.
 - a) Stack ADT b) Queue ADT

2. Write C++ programs to implement the following using a singly linked list.
 - a) Stack ADT b) Queue ADT

3. Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.

4. Write a C++ program to perform the following operations:
 - a) Insert an element into a binary search tree.
 - b) Delete an element from a binary search tree.
 - c) Search for a key element in a binary search tree.

5. Write C++ programs that use recursive functions to traverse the given binary tree in
 - a) Preorder b) inorder and c) postorder.

6. Write C++ programs that use non-recursive functions to traverse the given binary tree in
 - b) Preorder b) inorder and c) postorder.

7. Write C++ programs for the implementation of bfs and dfs for a given graph.

8. Write C++ programs for implementing the following sorting methods:
 - a) Merge sort b) Heap sort

9. Write a C++ program to perform the following operations
 - a) Insertion into a B-tree
 - b) Deletion from a B-tree

10. Write a C++ program to perform the following operation
 - a) Insertion into an AVL-tree

11. Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

12. Write a C++ program for implementing Knuth-Morris- Pratt pattern matching algorithm.

(Note: Use Class Templates in the above Programs)

References::

1. Data Structures and Algorithms Using C++ by Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education, 2010.
2. Classic Data Structures by D. Samanta, 2005, PHI
3. Data Structures and Algorithms by G.A.V. Pai, 2009, TMH.
4. Design and Analysis of Computer Algorithms by Aho, Hopcraft, Ullman 1998, PEA.
5. Introduction to the Design and Analysis of Algorithms by Goodman, Hedetniemi, TMG
6. Design and Analysis of Algorithms by E. Horowitz, S. Sahani, 3rd Edition, Galgotia.
7. Data Structures and Algorithms in C++ by Drozdek 2nd Edition, Thomson.
8. Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press

(17D08111) NETWORK PROGRAMMING LAB

Objective

- Create client and server applications using the "Sockets" API and the implementation of Data link layer protocol and TCP, UDP layer
- Ability to conduct computer communication network simulations.

1. Implement TCP Echo client and TCP Echo server (Iterative).
2. Implement TCP Echo client and TCP Echo server (Concurrent).
3. Implement TCP daytime client and TCP daytime server (Iterative).
4. Implement TCP daytime client and TCP daytime server (concurrent).
5. Implement UDP Echo Client and UDP Echo Server.
6. Implement UDP daytime Client and UDP daytime server.
7. Implement TCP client and server (concurrent) where client gets input from the user and sends it to server. Server displays it on the screen. Server then gets another input from the user and sends it to client. Client displays it on the screen. The process continues till server or client sends "bye" to the other party.
8. Implement TCP client and server (concurrent) where client requests server to transfer a file. Assume file is smaller than 1K size. If the file is present on the server, it is sent to the client otherwise an error message is sent to client. Client copies the file on the hard disk and disconnects.
9. Implement UDP client and UDP server where server displays the IP address and port number of the client sending the datagram. Client sends a datagram (size 64 bytes) three times to the same server. Server sends the message back to client. Client reports the time elapsed in sending and receiving of the message. Use connected UDP sockets.
10. Write to program to
 - i. display name of the host
 - ii. all IP addresses of the host.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

M.Tech I semester (CN)

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(17D08112) NETWORK SECURITY LAB

1. Working with Sniffers for monitoring network communication (Ethereal)
2. Understanding of cryptographic algorithms and implementation of the same in C or C++
3. Using openssl for web server - browser communication
4. Using GNU PGP
5. Performance evaluation of various cryptographic algorithms
6. Using IPTABLES on Linux and setting the filtering rules
7. Configuring S/MIME for e-mail communication
8. Understanding the buffer overflow and format string attacks
9. Using NMAP for ports monitoring
10. Implementation of proxy based security protocols in C or C++ with features like confidentiality, integrity and authentication

Following are some of the web links, which help to solve the above assignments

- http://linuxcommand.org/man_pages/openssl1.html
- <http://www.openssl.org/docs/apps/openssl.html>
- <http://www.queen.clara.net/pgp/art3.html>
- <http://www.ccs.ornl.gov/~hongo/main/resources/contrib/gpg-howto/gpg-howto.html>
- <https://netfiles.uiuc.edu/ehowes/www/gpg/gpg-com-0.htm>
- <http://www.ethereal.com/docs/user-guide/>