



T K R COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)
B.TECH. COMPUTER SCIENCE AND ENGINEERING-R17
COURSE STRUCTURE & SYLLABUS

IV YEAR I SEMESTER

S.No	Course code	Course Title	L	T	P	Credits
1	A57PC1	Network Security & Cryptography	4	0	0	4
2	A57PC2	Linux Programming	4	1	0	4
3	A57PC3	Machine Learning	3	1	0	3
4	A57PE4	1.Introduction to Big Data Analytics 2. Information Security Assessment and Audits 3.Mobile Computing	3	0	0	3
5	A57PE5	1.Internet Of Things 2.Design Patterns 3.Advance Computer Architecture	3	0	0	3
6	A57PE6	1 Software Process and Project Management 2.Computer Forensics 3. Information Retrieval Systems	3	0	0	3
7		Open Elective-3	3	1	0	3
8	A57PC8	Linux Programming Lab	0	0	3	2
9	A57PE8	Cutting Edge Technologies Lab	0	0	3	2
Total Credits						27

IV YEAR II SEMESTER

S.No	Course code	Course Title	L	T	P	Credits
1		Open Elective-4	3	0	0	3
2	A58PE2	1.Introduction to Predictive Analytics 2.Storage Area Networks 3.Information Security Incident Response and Management.	3	0	0	3
3	A58PE3	1.Adhoc Sensor Networks 2.E-Commerce 3. Human Computer Interaction	3	0	0	3
4	A58PW4	Industry Oriented Mini Project	0	0	0	2
5	A58SC5	Seminar	0	0	6	2
6	A58CV6	Comprehensive Viva	0	0	0	2
7	A58PW7	Major Project	0	0	18	9
Total Credits						24



T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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B.TECH. COMPUTER SCIENCE AND ENGINEERING - R17 NETWORK SECURITY & CRYPTOGRAPHY -A57PC1

B.Tech IV Year I Semester

**L/T/P/C
4/1/0/4**

COURSE OBJECTIVE:

1. To understand and learn the objectives of Network security, cryptographic algorithms.

COURSE OUTCOMES: After completion of the course student will be able to

1. Classify the symmetric algorithms and analyze the vulnerabilities in any computing system.
2. Understand the security mechanisms using rigorous approaches including theoretical concepts.
3. Understand the authentication and hash algorithms.
4. Summarize the intrusion detection and its solutions to overcome the attacks.

UNIT I:

SECURITY CONCEPTS

Introduction, the need for security, security approaches, principles of security, types of security attacks, security services, security mechanism, A Model for Network Security.

CRYPTOGRAPHY CONCEPTS AND TECHNIQUES

Introduction, Plain Text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible type of attacks.

UNIT II:

SYMMETRIC KEY CIPHERS

Block Cipher principles, DES, AES, Blowfish, RC5, IDEA, Block cipher operation, Stream ciphers, RC4.

ASYMMETRIC KEY CIPHERS

Principle of public key cryptosystems, RSA algorithm, Elgamal Cryptography, Diffie-Hellman Key Exchange, Knapsack Algorithm

UNIT III:

CRYPTOGRAPHIC HASH FUNCTIONS

Message Authentication, Secure Hash Algorithm (SHA- 512), Message authentication codes: Authentication requirements, HMAC, CMAC, Digital signatures, Elgamal Digital Signature Scheme.

KEY MANAGEMENT AND DISTRIBUTION

Symmetric Key Distribution Using Symmetric & Asymmetric Encryption, Distribution of Public Keys, Kerberos, X.509 Authentication Service, Public – Key Infrastructure

UNIT IV:

TRANSPORT-LEVEL SECURITY

Web security considerations, Secure Socket Layer and Transport Layer Security, HTTPS, Secure Shell (SSH)

WIRELESS NETWORK SECURITY

Wireless Security, Mobile Device Security, IEEE 802.11 Wireless LAN, IEEE 802.11i Wireless LAN Security

UNIT V:

E-MAIL SECURITY

Pretty Good Privacy, S/MIME IP Security: IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, combining security associations, Internet Key Exchange

CASE STUDIES ON CRYPTOGRAPHY AND SECURITY

Secure Multiparty Calculation, Virtual Elections, Single sign On, Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability.

TEXT BOOKS

1. Cryptography and Network Security - Principles and Practice: William Stallings, Pearson Education, 6th Edition
2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 3rd Edition

REFERENCE BOOKS

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition
3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning



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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

LINUX PROGRAMMING - A57PC2

B.Tech IV Year I Semester

L/T/P/C
4/1/0/4

COURSE OBJECTIVE:

To understand and make effective use of LINUX utilities and shell scripting.

COURSE OUTCOMES:

After completion of course the student is able to

1. Understand the basic commands of LINUX operating system and shell scripts.
2. Develop the necessary skills for system programming that includes file system programming, process and signal management and Inter Process Communication.
3. Develop the network programs using sockets.
4. Learn and understand file system concepts and directories.
5. Understand the Inter Process Communication.

UNIT I:

LINUX UTILITIES

An Introduction to Linux, General-purpose utilities, File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text Processing utilities and Backup utilities, the vi- editor. sed- scripts, operation, address, commands, applications, awk- execution, fields and records, scripts, operations, patterns, actions, associative arrays, string and mathematical functions, system commands in awk, applications.

SHELL PROGRAMMING WITH THE BOURNE AGAIN SHELL (BASH)

Introduction, shell responsibilities, pipes and Redirection, Here documents, Running a shell scripts, 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, interrupt processing, functions, debugging shell scripts

UNIT II:

FILES

File Concept, File types ,File system Structure, File meta data – Inodes, Kernel support for files, System calls for file I/O operations – open, create, read, write, close, lseek, dup2. File status information – stat family, file and record locking, fcntl function, file permissions – chmod, fchmod, file ownership- chown, lchown, fchown, Links – Soft links & hard links – symlink, link, unlink.

DIRECTORIES: Creating, removing, changing directories – mkdir, rmdir, chdir, obtaining current working directory – getcwd, directory contents, scanning directories – opendir, readdir, closedir, rewinddir function

UNIT-III: PROCESS

Process concepts, layout of a C program image in main memory, process environment – environment list, environment variables, getenv, setenv, Kernel support for process, process identification, process control- process creation, replacing a process image, Waiting for a process, process termination, zombie process, orphan process, system call interface for process management – fork, vfork, exit, wait, waitpid, exec family, process groups, session and controlling terminal, difference between threads and processes.

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.

UNIT-IV: INTER PROCESS COMMUNICATION

Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes – creation, IPC between related processes using Unnamed Pipes, FIFOs – creation, IPC between unrelated processes using FIFOs(Named pipes), difference between named and unnamed pipes, popen and pclose library functions.

Message Queues

Kernel support for messages, APIs for Message Queues, client/server examples.

Semaphores

Kernel support for semaphores, APIs for semaphores, FILE locking with semaphores.

UNIT-V: Shared Memory

Kernel support for Shared memory, APIs for shared memory, shared memory examples.

Sockets

Introduction to Berkeley Sockets, IPC over a network, client/server model, Sockets Address Structure(UNIX Domain & Internet Domain), Socket System calls for connection oriented Protocol and connectionless protocol, Example client/server programs – single server-client connection, multiple simultaneous clients, socket options – setsockopt and fcntl system calls, comparison of IPC mechanisms.

TEXT BOOKS

1. Unix concepts and Applications, 4th Edition, Sumitabha Das, TMH.
2. Unix System Programming using C++, T. Chan, PHI.
3. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones, Wrox, Willey India Edition.

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 Network Programming, W.R.Steven, PHI.
4. UNIX for Programming and users, 3rd Edition, Graham Glass, King Ables, Pearson Edition.



T K R COLLEGE OF ENGINEERING & TECHNOLOGY
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B.TECH. COMPUTER SCIENCE AND ENGINEERING –R17

MACHINE LEARNING -A57PC3

B.Tech IV Year I Semester

L/T/P/C
3/1/0/3

COURSE OBJECTIVES:

1. To be able to formulate machine learning problems corresponding to different applications and range of machine learning algorithms along with their strengths and weaknesses.

COURSE OUTCOMES:

1. Student should be able to understand the basic concepts such as decision trees and neural networks.
2. Ability to formulate machine learning techniques to respective problems.
3. Apply machine learning algorithms to solve problems of moderate complexity

UNIT-I:

INTRODUCTION - Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning

CONCEPT LEARNING AND THE GENERAL TO SPECIFIC ORDERING – Introduction, A concept learning task,

Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm, Remarks on version spaces and candidate elimination, Inductive bias

UNIT-II:

DECISION TREE LEARNING – Introduction, Decision tree representation, appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning

ARTIFICIAL NEURAL NETWORKS – Introduction, Neural network representation, appropriate problems for neural network learning, Perceptions, Multilayer networks and the back propagation algorithm, Remarks on the back propagation algorithm, An illustrative example face recognition Advanced topics in artificial neural networks

EVALUATION HYPOTHESES – Motivation, Estimation hypothesis accuracy, Basics of sampling theory, A general approach for deriving confidence intervals, Difference in error of two hypotheses, Comparing learning algorithms

UNIT-III:

BAYESIAN LEARNING – Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for

predicting probabilities, Minimum description length principle, Bayes optimal classifier, Gibbs algorithm, NaïveBayes classifier, An example learning to classify text, Bayesian belief networks The EM algorithm.

COMPUTATIONAL LEARNING THEORY – Introduction, Probability learning an approximately correct hypothesis, Sample complexity for Finite Hypothesis Space, Sample Complexity for infinite Hypothesis Spaces, The mistake bound model of learning

INSTANCE-BASED LEARNING- Introduction, k -Nearest Neighbour Learning, Locally Weighted

Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning

Genetic Algorithms – Motivation, Genetic Algorithms, An illustrative Example, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms

UNIT-IV:

Learning Sets of Rules – Introduction, Sequential Covering Algorithms, Learning Rule Sets: Summary, Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution

Analytical Learning - Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation- Based Learning, Explanation-Based Learning of Search Control Knowledge

UNIT V:

Combining Inductive and Analytical Learning – Motivation, Inductive-Analytical approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis, Using Prior Knowledge to Alter the Search Objective, Using Prior Knowledge to Augment Search Operators,

Reinforcement Learning – Introduction, the Learning Task, Q Learning, Non-Deterministic, Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming

TEXT BOOKS

1. Machine Learning – Tom M. Mitchell, - MGH
2. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis (CRC)

REFERENCE BOOKS

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



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B.TECH. COMPUTER SCIENCE AND ENGINEERING –R17

INTRODUCTION TO BIG DATA ANALYTICS - A57PE4

B.Tech IV Year I Semester

L/T/P/C
3/0/0/3

COURSE OBJECTIVE: To introduce the Big Data Analytics for Business, tools, technologies & programming languages which is used in day to day analytics cycle.

COURSE OUTCOMES: After completing this course the student must able to

1. Design and develop applications using Big Data
2. Design a frame work to analyze Big Data sets using analytics
3. Apply Machine Learning Algorithms on Big Data.

UNIT-I:

Data Management: Design Data Architecture and manage the data for Analysis, Understand various sources of data like sensors/signals/GPS. Etc. Data management, Data Quality (noise, outliers, missing values, duplicate data) and Data preprocessing. Export All the data on to the cloud ex.AWS/RAKSPACE etc

Maintain Healthy, Safe and Secure Working environment: Introduction, Work safety, Report Accidents & Emergencies, Protect Safety & healthy as your Work, course conclusion , assessment.

UNIT-II:

Big Data Tools: Big data Tools like Hadoop, Spark, Impala et., Data ETL Process, identify the gaps in the data and follow up for decision making.

Provide Data/Information in Standard Formats: Introduction, knowledge management, Standardized Reporting and compliances, Decision Models, Course conclusion, assessment.

UNIT-III:

Big Data Analytics: Run descriptive to understand the nature of the available data, collate all the data sources to suffice business requirement, Run descriptive statistics for all the variables and observer the data ranges, outlier detection and elimination.

UNIT-IV:

Machine Learning Algorithms: Hypothesis testing and determining the multiple analytical methodologies, train model on 2/3 sample data using various statistical/machine learning algorithms, Test model on 1/3 sample for prediction etc.

UNIT-V:

Data visualization: Prepare the data for the visualization, use tools like Tableau, Qlickview and D3, Draw Insights of visualization tool. product implementation

TEXT BOOK

1. Student Hand book Associate Analytics.

REFERENCE BOOKS

2. Introduction to Data mining, Tan, Steinbach and Kumar, Addison Wesley, 2006
3. Data mining Analysis And Concepts M. Zaike and W. Meira
:<http://www.dataminingbook.info/uploads/book.pdf>



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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

INFORMATION SECURITY ASSESSMENTS AND AUDITS -A57PE4

B.Tech IV Year I Semester

L/T/P/C
3/0/0/3

COURSE OBJECTIVE: Provide management with an assessment of the effectiveness of the information security management function and evaluate the scope of the information security management organization and determine whether essential security functions are being addressed effectively

COURSE OUTCOMES:

1. Processes associated with governance, policy, monitoring, incident management and management of the information security function
2. Processes associated with the implementation of security configurations
3. Processes associated with the selection and maintenance of security technologies

UNIT-I:

Information Security Performance Metrics And Audits: security metrics and reporting, common issues and variances of Performance Metrics, introduction to security Audits, Servers and Storage Devices, infrastructure and Networks, Communication Routes, information security Methodologies(Black-box, white-box, grey-box), phases of information security Audit and Strategies, ethics of an information security Auditor etc .

UNIT-II:

Information Security Audit Tasks, Reports And Post Auditing Actions: Pre-audit checklist, Information Gathering, Vulnerability Analysis, External Security Audit, internal Network Security Audit, Firewall Security Audit, IDS Security Auditing, Social Engineering security Auditing, Web Application Security Auditing, Information Security Audit Deliverables & Writing Report, Result Analysis, Post Auditing Actions, Report Relation etc.

UNIT-III:

Vulnerability Management: information Security Vulnerabilities-Threats and Vulnerabilities, Human-based Social Engineering, Computer-based Social Engineering, social Media countermeasures, Vulnerability Management- Vulnerability Scanning, testing, Threat Management, Remediation etc.

UNIT-IV:

Information Security Assessment: Vulnerability Assessment, Classification, types of Vulnerability Assessment, Vulnerability assessment Phases, Vulnerability Analysis stages, Characteristics of a good Vulnerability Assessment Solutions & Considerations, Vulnerability Assessment Records- Tools and Choosing a right Tool, Information Security Risk Assessment, Risk Treatment, Residual Risk, Risk Acceptance, Risk Management Feedback Loops etc.

UNIT-V:

Configuration Reviews: Introduction to Configuration Management, Configuration management Requirements-Plan-Control, Development of Configuration Control Policies, Testing Configuration Management etc.

TEXT BOOKS:

1. Assessing Information Security(strategies, tactics, logic and framework) by A Vladimirov, K. Garvrilenko, and A.Michajlowski
2. “The Art of Computer Virus Research and Defense by peterszor.”



T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

MOBILE COMPUTING -A57PE4

B.Tech IV Year I Semester

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

COURSE OBJECTIVE: The objective, is to learn and understand the concepts of mobile computing Paradigm, mobile networking infrastructure through popular GSM Protocol, issues and solutions of various layers of mobile networks, namely MAC layer, Network layer & Transport layer. Database issues in mobile environments and data delivery models, adhoc networks and related concepts, platforms and protocols, used in mobile environment.

COURSE OUTCOMES: After completion of the course the student will be to

1. Think and develop new mobile application.
2. Take any new technical issue related to this new paradigm and come up with solutions.
3. Develop new adhoc network applications and/or algorithms/protocols.
4. Understand and develop any existing or new protocol related to mobile environment.

UNIT-I:

INTRODUCTION

Mobile Communications, Mobile Computing, Paradigm, Promises/Novel Applications and Impediments and Architecture, Mobile and Hand Held Devices, Limitations of Mobile Hande Held Devices.

GSM

Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling Handover, Security, New Data Services, GPRS, CSHSD, DECT.

UNIT-II:

MEDIUM ACCESS CONTROL

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN (IEEE 802.11)

MOBILE NETWORK LAYER

IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunnelling and Encapsulation, Route Optimization, DHCP.

UNIT-III:

MOBILE TRANSPORT LAYER

Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

DATABASE ISSUES:

Database Hoarding & Caching Techniques, Client-Server Computing & Adaption, Transaction Models, Query Processing, Data Recovery Process & QoS Issues.

UNIT-IV:

DATA DISSEMINATION AND SYNCHRONIZATION

Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing methods,

DATA SYNCHRONIZATION

Introduction, Software and Protocol Models.

UNIT-V:

MOBILE ADHOC NETWORKS

Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, Mobile Agents, Service Directory.

PROTOCOLS AND PLATFORM FOR MOBILE COMPUTING:

WAP, Bluetooth, XML, J2ME, Java card, Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

TEXT BOOKS

1. Jochen Schiller, “ Mobile Communications”, Addison Wesley, Second Edition 2009.
2. Raj Kamal, “Mobile Computing”, Oxford Press, 2007, ISBN: 0195686772

REFERENCE BOOKS

1. Stojmenovic and Cacute, “ Handbook of Wireless Networks and Mobile Computing”, Wiley, 2002, ISBN: 0471419028
2. Reza Behravanfar, “ Mobile Computing Principles: Design and developing Mobile Applications with UML and XML”, ISBN: 0521817331, Cambridge University Press, October 2004.



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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

INTERNET OF THINGS - A57PE5

B.Tech IV Year I Semester

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

COURSE OBJECTIVE:

The objective is to learn and concepts of IOT and build simple IOT Systems.

COURSE OUTCOMES:

After completion of the course, the student should be able to:

1. Explain the concept of IoT.
2. Analyze various protocols for IoT.
3. Design a PoC of an IoT system using Rasperry Pi/Arduino
4. Apply data analytics and use cloud offerings related to IoT. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, —IoT Fundamentals
5. Analyze applications of IoT in real time scenario

UNIT-I:

INTRODUCTION TO INTERNET OF THINGS:

Introduction, physical design of IoT, logical design of IoT-functional blocks, communicational models, communication APIs, IoT enabling technologies, IOT levels & deployment templates

UNIT-II:

IOT AND M2M

Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT, IoT System Management with NETCONF-YANG: Need for IOT systems management, simple network management protocol, network operator requirements, NETCONF, YANG, IoT system management with NETCONF-YANG.

UNIT-III:

IOT PLATFORMS DESIGN METHODOLOGY

Introduction, IoT Design Methodology, Motivation for Python Hardware and Software for IoT: Logical design using Python-data types & Data Structures, control flow, functions, modules, packages, file handling, classes, and Python packages of Interest for IoT

UNIT-IV:

IOT PHYSICAL DEVICES & ENDPOINTS

IoT Device, Exemplary Device Rasperry-Pi, Board, Linux on Rasperry Pi, Rasperry Pi Interfaces, Programming, Rasperry Pi with python.

UNIT-V:**IOT PHYSICAL SERVERS & CLOUD OFFERINGS**

Introduction to Cloud Storage Models & Communication APIs. WAMP-AutoBahn for IoT, Xively Cloud for IoT, Python Web Application Framework –Django. Case Studies Illustration IoT Design: Introduction, Home Automation, Cities.

TEXT BOOK

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

REFERENCE BOOKS

1. Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017.
2. Olivier Hersent, David Boswarthick, Omar Elloumi , —The Internet of Things – Key applications and Protocols, Wiley, 2012 (for Unit 2).
3. 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.
4. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), —Architecting the Internet of Things, Springer, 2011.
5. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, O'Reilly Media, 2011.



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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

DESIGN PATTERNS - A57PE5

B.Tech IV Year I Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVE: The aim of the course is to infer the idea behind Design patterns in handling common problems faced during building an application.

COURSE OUTCOMES: After Completion of the Course the student will be able to

1. Understand the process of easily maintainable and scalable software design objectives.
2. Deploy the object oriented concepts for creating truly OOP programs.
3. Develop, creational design patterns for better class instantiation, structural design patterns for better class and object composition.
4. Design good behavioral patterns for better organization and communication between the objects.

UNIT – I:

Introduction: What is a design pattern? design patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT – II:

Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary.

UNIT-III:

CREATIONAL PATTERNS

Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-IV:

STRUCTURAL PATTERNS

Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy.

UNIT-V:**BEHAVIORAL PATTERNS**

Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor.

TEXT BOOK

1. Design Patterns, Erich Gamma, Pearson Education.

REFERENCE BOOKS

1. Patterns in Java Vol-I, Mark Grand, Wiley Dream Tech.
2. Patterns in Java Vol-II, Mark Grand, Wiley Dream Tech
3. Java Enterprise Design Patterns, Vol-III, Mark Grand, Wiley Dream Tech.
4. Head First Design Patterns, Eric Freeman, O'Reilly Publications.



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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

ADVANCE COMPUTER ARCHITECTURE - A57PE5

B.Tech IV Year I Semester

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

COURSE OBJECTIVE: To understand and gain insight knowledge on the architecture of computer systems.

COURSE OUTCOMES: After completion of course the student will be able to

1. Understand and classify the instructions, memory addressing, and operations, required for computer design.
2. Illustrate the operations for pipelines, implement classic five stage pipelined RISC processor.
3. Describe the operation of performance enhancements such as dynamic scheduling, branch prediction, cache and vector processors.
4. Describe modern architectures such as RISC, Super scalar, VLIW approach, understand the fundamentals of multiprocessors, and thread level parallelism.

UNIT-I:

FUNDAMENTALS OF COMPUTER DESIGN

Fundamentals of computer design, changing faces of computing and task of computer designer, Technology trends, cost price and their trends, measuring and reporting performance, quantitative principles of computer design, Amdahl's law

Instruction set principles and examples-Introduction, classifying Instruction-set, Memory addressing-type and size of operands, operations in the instruction set.

UNIT –II:

PIPELINES

Introduction, Basic RISC Instruction set, simple implementation of RISC instruction set, classic five stage pipelined RISC processor, basic performance issues in pipelining, Pipeline Hazards, Reducing pipeline branch penalties.

MEMORY HIERARCHY DESIGN

Introduction, review of ABC of cache, cache performance, reducing cache miss penalty, virtual memory.

UNIT –III:

INSTRUCTION LEVEL PARALLELISM THE HARDWARE APPROACH

Instruction-level parallelism, dynamic scheduling using Tomasulo's approach, Branch prediction, high performance instruction delivery-hardware based speculation.

UNIT –IV:

ILP SOFTWARE

Approach for basic compiler level techniques, Static branch prediction, VLIW approach, exploiting ILP, parallelism at compile time, cross cutting issues-hardware verses software.

UNIT –V:

MULTIPROCESSOR AND THREAD LEVEL PARALLELISM

Processors and thread level parallelism- Introduction, Characteristics of application domain, systematic shared memory architecture, distributed shared-memory architecture, synchronization.

TEXT BOOKS

1. John L. Hennessy, David A Patterson- Computer Architecture: A Quantitative approach, 3rd Edition, An Imprint of Elsevier.

REFERENCE BOOKS

1. John P. Shen and Mikko H Lipasti- Modern Processor Design: Fundamentals of Super Scalar Processors
2. Computer Architecture and Parallel Processing- Kai Hwang, Faye A. Briggs., McGraw Hill.
3. Advanced Computer Architecture. – A Design space approach Dezsó Szirmai, Terence Fountain, Peter Kacsuk, Pearson ed.



**T K R COLLEGE OF ENGINEERING & TECHNOLOGY
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B.TECH. COMPUTER SCIENCE AND ENGINEERING-R17

SOFTWARE PROCESS AND PROJECT MANAGEMENT -A57PE6

B.Tech IV Year I Semester

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

COURSE OBJECTIVE: The objective of the course is to focus of Principles, techniques, methods & tools for model-based management of software projects. Assurance of Product Quality and process adherence (Quality assurance), as well as experience based creation & improvement of models.

COURSE OUTCOMES:

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

UNIT –I:

CONVENTIONAL SOFTWARE MANAGEMENT

The waterfall model, conventional software management performance.

EVOLUTION OF SOFTWARE ECONOMICS:

Software economics, pragmatic software cost estimation.

UNIT-II:

IMPROVING SOFTWARE ECONOMICS

Reducing software product size, improving software process, improving team effectiveness. Improving automation, Achieving required quality, peer inspections. The old way and the new- the principles of conventional software engineering. Principles of modern software management, transitioning to an iterative process.

UNIT-III:

LIFE CYCLE PHASES

Engineering and production stages, inception, elaboration, construction, transition phases. Artifacts of the process: the artefact sets. Management artifacts, engineering artifacts, programmatic artifacts. Model based software architectures: A Management perspective and technical perspective.

UNIT-IV:

WORK FLOWS OF THE PROCESS

Software process workflow, Inter trans workflows. Checkpoints of the process: Major Mile stones, Minor Milestones, periodic status assessments. Iterative process planning work breakdown structures, planning guidelines, cost and scheduled estimating, interaction, planning process, pragmatic planning. Evolution of Project Organization, Project Organizations and responsibilities, Line-of-Business organization.

UNIT-V:

PROJECT CONTROL AND PROCESS INSTRUMENTATION:

The server care metrics, management indicators, and quality indicators. Life cycle expectations pragmatic software Metrics, Metrics Automation. Tailoring the Process: Process discriminates, example.

FUTURE SOFTWARE PROJECT MANAGEMENT

Modem project profiles next generation software economics modem process transitions.

CASE STUDY

The Command Center Processing and Display System. Replacement (CCPDS-R).

TEXT BOOKS

1. Software Project Management. Walker Royce, Pearson Education.
2. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, Tata MCGraw Hill.

REFERNCE BOOKS

1. Applied Software Project Management, Andrew Stebian, & Jennifer Greene, O'Reilly 2006.
2. Software Engineering Project Management. Richard H. Thayer & Edward Yourdon, Second edition, Wiley India, 2004.
3. Software Project Management in Practice Pankaj Jalote Pearson education, 2002.



T K R COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous)

B.TECH. COMPUTER SCIENCE AND ENGINEERING-R17

COMPUTER FORENSICS- A57PE6

B.Tech IV Year I Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVE:

The objective focuses on different roles computer plays in a certain crime, provide digital evidences which are obtained from the digital media.

COURSE OUTCOMES:

After completion of course the student will be to

1. Understand the usage of computer forensic, and how to use various forensic tools for a wide variety of investigations.
2. Analyse and continue further research in computer forensics.

UNIT-I:

Computer Forensics Fundamentals: Introduction to Computer Forensics, Use of Computer Forensics

In Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings,

Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps Taken by Computer Forensics Specialists, Who Can Use Computer Forensic Evidence? Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement

Computer Forensic Technology, Types of Business Computer Forensics Technology.

UNIT-II:

Computer Forensics Evidence and Capture: Data Recovery: Data Recovery Defined, Data Backup and Recovery, the Role of Backup in Data Recovery, the Data-Recovery Solution, Case Histories. Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options, Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence, General Procedure, Collecting and Archiving, Methods of Collection, Artifacts, Collection Steps, Controlling Contamination: The Chain of Custody Duplication and preservation of Digital Evidence.

UNIT-III:

Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene, Computer Evidence Processing Steps, Legal Aspects of Collecting and Preserving Computer Forensic Evidence. Computer Image Verification and Authentication: Special Needs of Evidential Authentication, Practical Considerations, Practical Implementation.

UNIT-IV:

Computer Forensics Analysis: Discovery of Electronic Evidence: Electronic Document Discovery: A Powerful New Litigation Tool, Identification of Data: Timekeeping, Time Matters, Forensic Identification and Analysis of Technical Surveillance Devices. Reconstructing Past Events: How to Become a Digital Detective, Useable File Formats, Unusable File Formats, Converting Files. Networks: Network Forensics Scenario, A Technical Approach, Destruction of Email, Damaging Computer Evidence, International Principles Against Damaging of Computer Evidence, Tools Needed for Intrusion Response to the Destruction of Data, Incident Reporting and Contact Forms.

UNIT-V:

Current Computer Forensics Tools: Evaluating Computer Forensics Tool Needs, Computer Forensics Software Tools, Computer Forensics Hardware Tools, Validating and Testing Forensics Software.

TEXT BOOKS

1. "Computer Forensics: Computer Crime Scene Investigation", JOHN R. VACCA, Firewall Media.
2. "Guide to Computer Forensics and Investigations"4e, Nelson, Phillips Enfinger, Steuart, Cengage Learning.

REFERENCE BOOKS

1. "Computer Forensics and Cyber Crime", Marjie T Britz, Pearson Education.
2. "Computer Forensics", David Cowen, McGraw Hill.



T K R COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)

B.TECH. COMPUTER SCIENCE & ENGINEERING – R17
INFORMATION RETRIEVAL SYSTEM -A57PE6

B.Tech IV Year I Semester

L/T/P/C
3/0/0/3

COURSE OBJECTIVE: To understand the different models of information storage and use retrieval utilities for extraction of information using various strategies.

COURSE OUTCOMES: After completion of course the student will be able to

1. Store and retrieve textual documents using appropriate models, use various retrieval utilities for improving search.
2. Understand of indexing and compressing documents to improve space and time efficiency
3. Develop the skill to formulate SQL like queries for unstructured data
4. Understand issues in web search.

UNIT-I:

Introduction, Retrieval Strategies: Vector space model, Probabilistic retrieval strategies: Simple term weights, Non binary independence model, Language Models.

UNIT-II:

Retrieval Utilities: Relevance feedback, Clustering, N-grams, Regression analysis, Thesauri.

UNIT-III:

Retrieval Utilities: Semantic networks, Parsing Cross-Language Information Retrieval: Introduction, Crossing the language barrier.

UNIT-IV:

Efficiency: Inverted index, Query processing, Signature files, Duplicate document detection.

UNIT-V:

Integrating Structured Data and Text

A Historical progression, Information retrieval as a relational application, Semi-structured search using a relational schema

Distributed information Retrieval

A Theoretical model of distributed retrieval Web search.

TEXT BOOK

1. David A. Grossman, Ophir Frieder, information Retrieval —Algorithms and Heuristics, Springer, 2 Edition (Distributed by Universities Press), 2004.

REFERENCE BOOKS

1. Gerald J Kowaiski, Mark T Maybury. Information Storage and Retrieval Systems, Springer, 2000
2. Soumen Chakrabarti, Mining the Web: Discovering Knowledge from Hypertext Data, Morgan-Kaufmann Publishers, 2002
3. Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze, An Introduction to Information Retrieval, Cambridge University Press, Cambridge, England, 2009



T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

LINUX PROGRAMMING LAB -A57PC8

B.Tech IV Year I Semester

L/T/P/C

0/0/3/2

COURSE OBJECTIVE To write shell script programs for simple problems. To implement some standard Linux utilities such as ls,cp etc using system calls and to develop network based applications.

COURSE OUTCOMES:

After completion of course the students will be

1. To demonstrate the basic knowledge of Linux commands and file handling utilities by using Linux shell environment.
2. To evaluate the concept of shell scripting programs by using an AWK and SED commands.
3. To create the directory, how to change and remove the directory.
4. To analyse the process of how the parent and child relationships
5. To define IPC mechanism.
6. To understand the concept of client-server communication by using sockets

Experiments

- 1) Write a shell script that accept a file name starting and ending line numbers as arguments and display all the lines between given line no:
- 2) Write a shell script that delete all lines containing a specified word
- 3) Write a shell script that displays a list of all the files in the current directory
- 4) Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file or directory.
- 5) Write a shell script that accept a list of file names as arguments count and report the occurrence of each word.
- 6) Write a shell script to find the factorial of given integer
- 7) Write a shell script that list the all files in a directory.
- 8) Write a awk script to find the number of characters, words and lines in a file? 16 linked list respectively.
- 9) Write a C Program that makes a copy of a file using standard I/O and system calls?
- 10) Implement in C the following Unix commands using system calls A) cat B)mv
- 11) Write a C program to emulate the UNIX ls-l command?
- 12) Write a C program to list for every file in a directory,its inode number and file name.?
- 13) Write a C Program that demonstrates redirection of standard output to a file .
- 14) Write a C program to create a child process and allow the parent to display “parent” and the child to display “child” on the screen

- 15) Write a C program to create a child process and allow the parent to display “parent” and the child to display “child” on the screen.?
- 16) Write a C program to create a Zombie process.?
- 17) Write a C program that illustrates how an orphan is created
- 18) Write a program that illustrates how to execute two commands concurrently with a command pipe.?
- 19) Write a C programs that illustrate communication between two unrelated processes using named pipe.
- 20) Write a C program to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.?
- 21) Write a C program that illustrates suspending and resuming processes using signals
- 22) Write client and server programs(using c) for interaction between server and client processes using Unix Domain sockets
- 23) Write a client and server programs(using c)for interaction between server and client processes using Internet Domain sockets?
- 24) write a program to implement the shared memory
- 25) Write a client and server programs(using c)for interaction between server and client processes using Internet Domain sockets?
- 26) Write a C program that illustrates two processes communicating using shared memory



TKR COLLEGE OF ENGINEERING & TECHNOLOGY

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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

CUTTING EDGE TECHNOLOGIES LAB -A57PE8

B.Tech IV Year I Semester

L/T/P/C

0/0/3/2

COURSE OBJECTIVE: To disseminate the practical demonstration the concepts of Machine learning and Internet of Things.

MACHINE LEARNING CONCEPTS:

COURSE OUTCOMES: After completion of the course the students will be able to

1. Make use of Data sets in implementing the machine learning algorithms
2. Implement the machine learning concepts and algorithms in any suitable language of choice.

Note to students for implementation.

1. The programs can be implemented in either JAVA or Python.
2. For Problems 1 to 6 and 10, programs are to be developed without using the built-in classes or APIs of Java/Python.

Note: Data sets can be taken from standard repositories

(<https://archive.ics.uci.edu/ml/datasets.html>) or constructed by the students

1. Implement and demonstrate the **FIND-S algorithm** for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.
2. For a given set of training data examples stored in a .CSV file, implement and demonstrate the **Candidate-Elimination algorithm** to output a description of the set of all hypotheses consistent with the training examples.
3. Write a program to demonstrate the working of the decision tree based ID3 **algorithm**. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.

4. Build an Artificial Neural Network by implementing the **Back propagation algorithm** and test the same using appropriate data sets.
5. Write a program to implement the **naïve Bayesian classifier** for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.
6. Assuming a set of documents that need to be classified, use the **naïve Bayesian Classifier** model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.
7. Write a program to construct a **Bayesian network** considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.
8. Apply **EM algorithm** to cluster a set of data stored in a .CSV file. Use the same data set for clustering using **k-Means algorithm**. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.
9. Write a program to implement **k-Nearest Neighbour algorithm** to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.
10. Implement the non-parametric **Locally Weighted Regression algorithm** in order to fit data points. Select appropriate data set for your experiment and draw graphs.

INTERNET OF THINGS LAB

COURSE OUTCOMES: After completion of the course the student will be able to

1. Develop the programs in python.
2. get knowledge of Arduino IDE and different types of Arduino Board
3. Write program using Arduino IDE for Blink LED
4. Developed programs using Arduino IDE and Arduino Board for RGB Led, RFID, NFC, MQTT Protocol and LED blinking using Raspberry Pi.

List of Programs

1. Study and Install Python in Eclipse and WAP for data types in python.
2. Write a Program for arithmetic operation in Python.
3. Write a Program for looping statement in Python.
4. Study and Install IDE of Arduino and different types of Arduino.

5. Write program using Arduino IDE for Blink LED.
6. Write Program for RGB LED using Arduino.
7. Study the Temperature sensor and Write Program for monitor temperature using Arduino.
8. Study and Implement RFID, NFC using Arduino.
9. Study and implement MQTT protocol using Arduino.
10. Study and Configure Raspberry Pi.
11. WAP for LED blink using Raspberry Pi.
12. Study and Implement Zigbee Protocol using Arduino / Raspberry Pi.



T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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B.TECH. COMPUTER SCIENCE AND ENGINEERING – R17

PREDICTIVE ANALYTICS - A58PE2

B.Tech IV Year II Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVE: to understand the basic principles involved in analysing the predictive behaviour for business activities.

COURSE OUTCOMES: After completion of the course the student will be able

1. To learn and understand the terminology of predictive analytics frame work and its Applications
2. Apply Logistic regression techniques, implement objective segmentation for performing prediction tasks for business needs.
3. Apply time series methods for analysing and predicting the business needs.
4. Implement standard process for working with documents.

Unit – I:

Introduction to Predictive Analytics & Linear Regression : What and Why Analytics, Introduction to Tools and Environment, Application of Modelling in Business, Databases & Types of data and variables, Data Modelling Techniques, Missing imputations etc. Need for Business Modelling. Regression — Concepts, Linear property-assumptions-Least Square Estimation. Variable Rationalization, and Model Building etc.

Unit – II:

Logistic Regression : Model Theory, Model fit Statistics, Model Conclusion, Analytics applications to various Business Domains etc. Regression Vs Segmentation — Supervised and Unsupervised Learning, Tree Building — Regression, Classification, Overfitting, Pruning and complexity. Multiple Decision Trees etc.

Unit – III:

Objective Segmentation : Regression Vs Segmentation — Supervised and Unsupervised Learning, Tree Building — Regression, Classification, Overfitting, Pruning and complexity, Multiple Decision Trees etc. Develop Knowledge, Skill and Competences (NOS 9005) Introduction to Knowledge skills & competences, Training & Development, Learning & Development, Policies and Record keeping, etc.

Unit – IV:

Time Series Methods Forecasting, Feature Extraction : Arima, Measures of Forecast Accuracy, STL approach, Extract features from generated model as Height, Average, Energy etc and Analyze for prediction. Project

Unit – V:

Working with Documents : Standard Operating Procedures for documentation and knowledge sharing. Defining purpose and scope documents, Understanding structure of documents — case studies, articles, white papers, technical reports, minutes of meeting etc., Style and format, Intellectual Property and Copyright, Document preparation tools — Visio, PowerPoint, Word, Excel etc., Version Control, Accessing and updating corporate knowledge base. Peer review and feedback.

TEXT BOOK

- Student's Handbook for Associate Analytics-III.

REFERENCE BOOK

Gareth James • Daniela Witten • Trevor Hastie Robert Tibshirani. An Introduction to Statistical Learning with Applications in R



T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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B.TECH. COMPUTER SCIENCE AND ENGINEERING -R17

STORAGE AREA NETWORKS -A58PE2

B.Tech IV Year II Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVE: To demonstrate and understand the storage networks and their products, also provide mechanisms for the backup or recovery.

COURSE OUTCOMES: After completion of the course the student will be able to

1. Understand storage area networks characteristics and components, become familiar with SAN vendors and their products.
2. Acquire knowledge on fibre channel protocols and know how to use SAN components for communicating with each other.
3. Learn the features of CISCO MDS 9000 Multilayer directors and fabric switches, CISCO SAN-OS features in detail.
4. To understand the use of all SAN-OS commands, practice variation of SANOS features.

UNIT- I:

Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities Hardware and software components of the host environment, Key protocols and concepts used by each component ,Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications.

UNIT- II:

Concept of RAID and its components , Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN , Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfills the need , Understand the appropriateness of the different networked storage options for different application environments

UNIT- III:

List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures.

UNIT- IV:

Architecture of backup/recovery and the different backup/recovery topologies , replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities

UNIT- V:

Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center. 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.

Case Studies:

The technologies described in the course are reinforced with EMC examples of actual solutions. Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

TEXT BOOK

1. EMC Corporation, Information Storage and Management, Wiley.

REFERENCE BOOKS

1. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill, Osborne, 2003.
2. Marc Farley, "Building Storage Networks", Tata McGraw Hill, Osborne, 2001.
3. Meeta Gupta, Storage Area Network Fundamentals, Pearson Education Limited, 2002.



T K R COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)

B.TECH. COMPUTER SCIENCE AND ENGINEERING –R17

**INFORMATION SECURITY INCIDENT RESPONSE
AND MANAGEMENT - A58PE2**

B.Tech IV Year II Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVE: To understand the significance of information and incident management in terms of network security.

COURSE OUTCOMES:

1. To introduce the terminology and its applications.
2. To introduce the concepts and responsibility of security analyst.
3. To introduce the tools, technologies and programming languages which are used in day to day security analyst job role.

UNIT-I:

Managing Information Security Services: Configuring Network Devices, Identifying Unauthorized Devices, Testing the Traffic Filtering Devices, Configuring Router, Configuring Modes — Router Global interface/Line/Privilege EXEC/ROM/IOU ser EXEC, Configuring a banner/Firewall Bastion Host NPN server etc.

UNIT-II:

Troubleshooting Network Devices and Services: Introduction & Methodology of Troubleshooting, Troubleshooting of Network Communication-Connectivity-Network Devices- Network Slowdowns-Systems-Modems etc.

UNIT-III:

Information Security Incident Management & Data Backup: Information Security Incident Management overview-Handling-Response, Incident Response Roles and Responsibilities, Incident Response Process etc. Data Backup introduction, Types of Data Backup and its techniques, Developing an Effective Data Backup Strategy and Plan, Security Policy for Backup Procedures.

UNIT-IV:

Log Correlation: Computer Security Logs, Configuring & Analyzing Windows Logs, Log Management-Functions & Challenges, Centralized Logging and Architecture, Time Synchronization — NTP NIST etc. Develop Knowledge Skill and competences (NOS 9005)

UNIT-V:

Handling Network Security Incidents: Network Reconnaissance Incidents, Network Scanning Security Incidents, Network Attacks and Security Incidents, Detecting DoS Attack, DoS Response Strategies, Preventing/stopping a DoS Incident etc.

Handling Malicious Code Incidents: Incident Handling Preparation, Incident Prevention, Detection of Malicious Code, Containment Strategy. Evidence Gathering and Handling, Eradication and Recovery,

Recommendations etc. Project.

TEXT BOOKS

1. Managing Information Security Risks, The Octave Approach by Christopher Alberts, and Audrey Dorofee
2. 'Cryptography and Network Security (4th Edition) by (Author) William Stallings.

REFERENCE BOOKS

1. <https://www.sans.org/reading-room/whitepapers/incident/security-incident-handling-small-organizations-32979>



T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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B.TECH. COMPUTER SCIENCE AND ENGINEERING-R17

ADHOC SENSOR NETWORKS -A58PE3

B.Tech IV Year II Semester

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

COURSE OBJECTIVE: To, understand the concept of ad-hoc and sensor networks, design and implement sensor network protocols, Evaluate measurements of protocol performance in sensor networks.

COURSE OUTCOMES: After completion of the course the student will be able to

1. To understand the concepts of sensor networks
2. To understand the MAC and transport protocols for adhoc networks
3. To understand the security of sensor networks
4. To understand the applications of adhoc and sensor networks

UNIT- I:

INTRODUCTION TO AD HOC WIRELESS NETWORKS: Characteristics of MANETs, Applications of MANETs, Challenges.

ROUTING IN MANETs: Topology-based versus Position-based approaches, Topology based routing protocols, Position based routing, Other Routing Protocols.

UNIT- II:

DATA TRANSMISSION IN MANETs: The Broadcast Storm, Multicasting, Geocasting

TCP OVER AD HOC NETWORKS: TCP Protocol overview, TCP and MANETs, Solutions for TCP over Ad Hoc

UNIT- III:

BASICS OF WIRELESS SENSORS AND APPLICATIONS: The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications

DATA RETRIEVAL IN SENSOR NETWORKS: Classification of WSNs, MAC layer, Routing layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs.

UNIT- IV:

SECURITY : Security in Ad hoc Wireless Networks, Key Management, Secure Routing, Cooperation in MANETs, Intrusion Detection Systems.

SENSOR NETWORK PLATFORMS AND TOOLS: Sensor Network Hardware, Sensor Network Programming Challenges, Node-Level Software Platforms

UNIT- V:

OVER VIEW OF OPERATING SYSTEM – TinyOS

OVERVIEW OF IMPERATIVE LANGUAGES: nesC, Dataflow style language: TinyGALS, Node-Level Simulators, ns- 2 and its sensor network extension, TOSSIM

TEXT BOOKS

1. Ad Hoc and Sensor Networks – Theory and Applications, *Carlos Corderio Dharma P. Aggarwal*, World Scientific Publications / Cambridge University Press, March 2006
2. Wireless Sensor Networks: An Information Processing Approach, *Feng Zhao, Leonidas Guibas*, Elsevier Science imprint, Morgan Kauffman Publishers, 2005, rp2009.

REFERENCE BOOKS

1. Adhoc Wireless Networks – Architectures and Protocols, C.Siva Ram Murthy, B.S.Murthy, Pearson Education, 2004
2. Wireless Sensor Networks – Principles and Practice, Fei Hu, Xiaojun Cao, An Auerbach book, CRC Press, Taylor & Francis Group, 2010
3. Wireless Ad hoc Mobile Wireless Networks – Principles, Protocols and Applications, Subir Kumar Sarkar, et al., Auerbach Publications, Taylor & Francis Group, 2008.
4. Ad hoc Networking, *Charles E. Perkins*, Pearson Education, 2001.
5. Wireless Ad hoc Networking, *Shih-Lin Wu, Yu-Chee Tseng*, Auerbach Publications, Taylor & Francis Group, 2007



T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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B.TECH. COMPUTER SCIENCE AND ENGINEERING-R17

E-COMMERCE -A58PE3

**B.Tech IV Year II Semester
L/T/P/C**

**3/0/0/
3**

COURSE OBJECTIVE: to identify business relationships between the organizations and their customers, perform various transactions like payment, data transfer etc.

COURSE OUTCOMES:

1. After completion of course the student will be able to Identify, the major categories and trends of e-commerce applications, the essential processes of an e-commerce system.
2. Discover several factors and web store requirements needed to succeed in e-commerce, discuss the benefits and trade-offs of various e-commerce clicks and bricks alternatives.
3. Understand the main technologies behind e-commerce systems and how these technologies interact, discuss the various marketing strategies for an online business.
4. Define various electronic payment types and associated security risks and the ways to protect against them.

UNIT – I:

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT – II:

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce - EDI, EDI Implementation, Value added networks. Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT – III:

Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research. Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing

UNIT – IV:

Web Marketing Strategies, Communicating with Different Market Segments, Beyond Market Segmentation: Customer Behavior and Relationship Intensity, Advertising on the Web, E- Mail Marketing, Search Engine Positioning and Domain Names, Selling to Businesses Online, Electronic Data Interchange, Supply Chain Management Using Internet Technologies, Electronic Marketplaces and Portals

UNIT – V:

E-Business Revenue Models, Revenue Models for Online Business, Changing Strategies: Revenue Models in Transition, Revenue Strategy Issues for Online Businesses, Creating an Effective Business Presence Online, Web Site Usability, Virtual Communities, Mobile Commerce, Online Auctions

TEXT BOOK

1. Frontiers of electronic commerce – Kalakata, Whinston, Pearson. (UNITS 1, 2, 3)
2. E-Business by Gary P. Schneider, - Cengage India Learning (UNITS 4, 5)

REFERENCE BOOKS

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, John Wiley.
2. E-Commerce, S. Jaiswal – Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H. Michael Chang.
4. Electronic Commerce – Gary P. Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C. Taudon, Carol Guyerico Trave



T K R COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)
B.TECH. COMPUTER SCIENCE AND ENGINEERING-R17

HUMAN COMPUTER INTERACTION -A58PE3

B.Tech IV Year II Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVE: To apply HCI and principles to interaction design, and also design certain tools for blind or PH People

COURSE OUTCOMES: After completion of the course the student will be able to

1. Understand the importance of user interface and graphical user interface.
2. Design screen, emphasizing on view of navigation and flow, focus, statistical graphics.
3. Implement new and window navigation schemes, design components for multimedia Interaction.
4. Implement HCI features in software process and evaluate them using design methods

UNIT – I:

Introduction: Importance of user Interface – definition, importance of good design.

Benefits of good design. A brief history of Screen design.

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT – II:

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, and understanding business junctions.

Screen Designing:- Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT- III:

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls. Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT- IV:

HCI in the software process, The software life cycle Usability engineering Iterative design and prototyping Design Focus: Prototyping in practice Design rationale Design rules Principles to support usability Standards Golden rules and heuristics HCI patterns Evaluation techniques, Goals of evaluation, Evaluation through expert analysis, Evaluation through user participation, Choosing an evaluation method. Universal design, Universal design principles Multi-modal interaction

UNIT- V:

Cognitive models Goal and task hierarchies Design Focus: GOMS saves money Linguistic models The challenge of display-based systems Physical and device models Cognitive architectures Ubiquitous computing and augmented realities Ubiquitous computing applications research Design Focus: Ambient Wood – augmenting the physical Virtual and augmented reality Design Focus: Shared experience Design Focus: Applications of augmented reality Information and data visualization Design Focus: Getting the size right

TEXT BOOKS

1. The essential guide to user interface design, Wilbert O Galitz, Wiley Dream Tech. Units 1, 2, 3
2. Human – Computer Interaction. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Pearson Education Units 4,5

REFERENCE BOOKS

1. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.
3. User Interface Design, Soren Lauesen , Pearson Education.
4. Human –Computer Interaction, D. R. Olsen, Cengage Learning.
5. Human –Computer Interaction, Smith - Atakan, Cengage Learning.