



SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JNTUK, Kakinada), (Recognised by AICTE, New Delhi)

Accredited by NAAC with 'A' Grade, All UG Programmes are Accredited by NBA

Recognised as Scientific and Industrial Research Organisation

CHINNA AMIRAM (P.O):: BHIMAVARAM :: W.G.Dt., A.P., INDIA :: PIN: 534 204

SCHEME OF INSTRUCTION & EXAMINATION

(Regulation R17)

IV/IV B.TECH

(With effect from **2017-2018** Admitted Batch onwards)

INFORMATION TECHNOLOGY

(Accredited by NBA)

I-SEMESTER

Code No.	Name of the Subject	Credits	Lect Hrs	Tutorial Hrs	Lab Hrs	Contact Hrs/Week	Internal Marks	External Marks	Total Marks
B17 IT 4101	Distributed Systems	3	3	1	-	4	30	70	100
B17 IT 4102	Mobile Computing	3	3	1	-	4	30	70	100
B17 BS 4101	Managerial Economics and Financial Accountancy	3	3	1	-	4	30	70	100
#ELE-I	Elective-I	3	3	1	-	4	30	70	100
#ELE-II	Elective-II	3	3	1	-	4	30	70	100
B17 IT 4111	Mobile Computing Lab	2	-	-	3	3	50	50	100
B17 IT 4112	Cryptography and Network Security Lab	2	-	-	3	3	50	50	100
Total		19	15	5	6	26	250	450	700

#ELE-I	B17 IT 4103	Bigdata Analytics
	B17 IT 4104	Information Retrieval System
	B17 IT 4105	Internet of Things
	B17 IT 4106	Multimedia Programming
#ELE-II	B17 IT 4107	Embedded Systems
	B17 IT 4108	Software Project Management
	B17 IT 4109	Machine Learning
	B17 IT 4110	Decision Support Systems

DISTRIBUTED SYSTEMS

Lecture : 3 Periods
Tutorial : 1 Period.
Exam : 3 Hrs.

Int. Marks : 30
Ext. Marks : 70
Credits : 3

Course Objectives:

1. Provides an introduction to the fundamentals of distributed computer systems, assuming the availability of facilities for data transmission, IPC mechanisms in distributed systems, Remote procedure calls.
2. Expose students to current technology used to build architectures to enhance distributed Computing infrastructures with various computing principles

Course Outcomes: By the end of the course, student should be able to:

S.No	Out Come	Knowledge Level
1	Describe important characteristics of distributed systems and the salient architectural features of such systems.	K2
2	Describe ways and protocols of inter process communication.	K2
3	Describe features of distributed file systems and the support provided by operating system in a distributed environment.	K2
4	Describe issues related to transaction support and controlling processes.	K2

SYLLABUS**UNIT-I :**

Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges.

System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations, Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model.

UNIT-II

Interprocess Communication: Introduction, The API for the Internet Protocols- The Characteristics of Interprocess communication, Sockets, UDP Datagram Communication, TCP Stream Communication; External Data Representation and Marshalling; Client Server Communication; Group Communication- IP Multicast- an implementation of group communication, Reliability and Ordering of Multicast.

UNIT-III

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects- Object Model, Distributed Object Model, Design Issues for RMI, Implementation of RMI, Distributed Garbage Collection; Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI

UNIT-IV

Operating System Support: Introduction, The Operating System Layer, Protection, Processes and Threads –Address Space, Creation of a New Process, Threads.

Distributed File Systems: Introduction, File Service Architecture; Peer-to-Peer Systems: Introduction, Napster and its Legacy, Peer-to-Peer Middleware, Routing Overlays.

UNIT-V

Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication

Transactions & Replications: Introduction, System Model and Group Communication, Concurrency Control in Distributed Transactions, Distributed Dead Locks, Transaction Recovery; Replication-Introduction, Passive (Primary) Replication, Active Replication.

Text Books:

1. Ajay D Kshemkalyani, Mukesh Sigal, “Distributed Computing, Principles, Algorithms and Systems”, Cambridge
2. George Coulouris, Jean Dollimore, Tim Kindberg, “Distributed Systems- Concepts and Design”, Fourth Edition, Pearson Publication

Reference Books:

1. Distributed-Systems-Principles-Paradigms-Tanenbaum PHI

MOBILE COMPUTING**Lecture : 3 Periods****Int.Marks : 30****Tutorial : 1 Period.****Ext. Marks : 70****Exam : 3 Hrs.****Credits : 3****Course Objectives:**

1. To make the student understand the concept of mobile computing paradigm, its novel applications and limitations.
2. To understand the typical mobile networking infrastructure through a popular GSM protocol
3. To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
4. To understand the database issues in mobile environments & data delivery models.
5. To understand the ad hoc networks and related concepts.
6. To understand the platforms and protocols used in mobile environment.

Course Outcomes:

S.No	Out Come	Knowledge Level
1	Understand the principles and paradigms of mobile computing technologies	K2
2	Analyze technical issues related to new paradigm and come up with a solution(s).	K4
3	Analyze MAC protocols and mobile network layer protocols	K4
4	Illustrate data base issues and dissemination in mobile computation	K2

SYLLABUS**UNIT- I**

Introduction: Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

UNIT –II

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, GPRS.

UNIT –III

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

UNIT –IV

Mobile Network Layer: TCP/IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP

UNIT- V

Database Issues and Data Dissemination: Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process, Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models,

Text Books:

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

Reference Books:

1. ASOKE K TALUKDER, HASAN AHMED, ROOPA R YAVAGAL, "Mobile Computing, Technology Applications and Service Creation" Second Edition, Mc Graw Hill.
2. UWE Hansmann, Lothar Merk, Martin S. Nocklous, Thomas Stober, "Principles of Mobile Computing," Second Edition, Springer
3. G.Sasibhushana Rao, " Mobile Cellular Communication" Pearson Publications.

MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTANCY
(Common to CSE & IT)

Lecture	: 3 Periods	Int. Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

1. To Study Managerial Economics and Demand Analysis
2. To familiarize about the Concepts of Cost and Break-Even Analysis.
3. To understand the nature of markets and to know the Pricing Policies
4. To learn about Accounting cycle and preparation of Financial Statements.
5. To know the concept of Capital and sources of raising and Depreciation

Course Outcomes:

S. No	Outcomes	Knowledge level
1	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product.	K2
2	The knowledge of understanding Cost and its types and ability to calculate BEP	K3
3	The pupil is also ready to understand the nature of different markets	K2
4	The Learner is able to understand Pricing Practices prevailing in today's business world	K2
5	The Learner is able to prepare Financial Statements and know how to calculate Profit & Loss for a firm	K3
6	The Learner can able to know Types of capital and their sources and know how to calculate Depreciation	K2

SYLLABUS**UNIT -I****Introduction to Managerial Economics and demand Analysis:**

Managerial Economics: Definition of Economics & Classification of Economics (Micro & Macro), Meaning, Nature, & Scope of Managerial Economics. **Demand Analysis:** Concept of Demand, Determinants of Demand, Demand schedule, Demand curve, Law of Demand and its exceptions. Elasticity of Demand, Types of Elasticity of Demand. Importance of demand forecasting and its Methods.

UNIT- II:

Cost Analysis: Importance of cost analysis, **Types of Cost-** Actual cost Vs Opportunity cost, Fixed cost Vs Variable cost, Explicit Vs Implicit cost, Historical cost Vs Replacement cost, Incremental cost Vs Sunk cost; **Elements of costs** – Material, Labor, Expenses; **Methods of costing** - Job costing, contract costing, Process costing, Batch costing, Unit costing, Service costing, Multiple costing. **Break-even analysis:** Determination of Breakeven point - Applications, Assumptions and Limitations of Break -even analysis (Theory only).

UNIT -III

Introduction to Markets & Pricing Policies

Market Structures: Salient Features of Perfect Competition, Monopoly, Monopolistic competition, Oligopoly and Duopoly. **Pricing:** Importance of pricing and its meaning ; **Methods of Pricing: Cost Based** -Full cost, Mark-up, Marginal & Break even; **Demand Based** - Penetrating, Skimming; **Competition Based-** Going rate, Sealed Bid, Discount; **Internet Pricing** - Flat-rate, Usage sensitive.

UNIT -IV

Introduction to Accounting & Financing Analysis: Importance of Accounting: Meaning, Types of accounts - Personal a/c, Real a/c, Nominal a/c, Rules of Debit and Credit, Accounting cycle, Recording, Classifying, & Summarizing Financial Statements; Journal and Ledger their differences; Contents of Trading, Profit & loss a/c, and Balance Sheet (Theory only).

UNIT V: Capital & Depreciation: Types of Capital - Fixed capital & Working Capital, Components of Working Capital, Factors influencing Working capital. Methods of Raising Finance - Long term, Medium term, & Short term financial sources. **Depreciation-** Importance of depreciation and its meaning, causes; Methods of Depreciation- Straight line and diminishing balancing methods.(Theory only)

Text Books:

1. A R Aryasri, Managerial Economics and Financial Analysis, TMH Pvt.Ltd, New Delhi
2. Dr. N.Appa Rao, Dr.P.VijayKumar: 'Managerial Economics and Financial Analysis', Cengage Publications, New Delhi

Reference Books :

1. Dr.B.Kuberudu & T.V. Ramana : Managerial Economics and Financial analysis, Himalaya Publishing House
2. Varshney R.L, K.L Maheswari, Managerial Economics, S. Chand & Company Ltd,
3. Shashi K. Gupta & R.K. Sharma Management Accounting, Kalyani Publishers
4. Maheswari S.N, An Introduction to Accountancy, Vikas Publishing House Pvt Ltd

BIG DATA ANALYTICS
(Elective-I)

Lecture : 3 Periods
Tutorial : 1 Period.
Exam : 3 Hrs.

Int.Marks : 30
Ext. Marks : 70
Credits : 3

Course Objectives:

1. To provide an overview of an exciting growing field of Big Data analytics.
2. To Introduce the tools required to manage and analyze big data like Hadoop Map Reduce, Pig & Hive etc.,

Course Outcomes:

S.No	Outcome	Knowledge Level
1	To Understand the existing technologies and the need of distributed files systems to analyze the Big Data	K2
2	To Implement and analyze Map-Reduce programming model for better optimization on Big Data.	K3
3	To Collect, manage, store, query, and analyze Big Data; and identify the need of interfaces to perform I/O operations in Hadoop	K3
4	To Identify the need of Modern tools, viz., Pig and Hive and its applications on Big Data Analytics	K3

SYLLABUS

UNIT-I

Introduction to Big Data: Big Data (BD) Definition, Characteristics of Big Data (Volume, Velocity, Verity, Veracity, Validity etc.), Applications of BD, Types of Data: Structured, Un-Structured and Semi-Structured. Data in RDBMS, Data in Warehouse & Data in Hadoop.

Working with Big Data: Google File System, Hadoop Distributed File System (HDFS), Building blocks of Hadoop (Name node, Data node, Secondary Name node, Job Tracker, Task Tracker)

UNIT-II

Hadoop Environment setup: Introducing and Configuring Hadoop cluster (Local, Pseudo-distributed mode, Fully Distributed mode), Configuring XML files.

Writing Map Reduce Programs: A Weather Dataset, Understanding Hadoop API for Map Reduce Framework (Old and New), **Basic programs of Hadoop Map Reduce:** Driver code, Mapper code, Reducer code, Record Reader, Combiner, Partitioner.

UNIT-III

Hadoop I/O: The Writable Interface, Writable Comparable and comparators, **Writable Classes:** Writable wrappers for Java primitives, Text, Bytes Writable, Null Writable, Object Writable and Generic Writable, Writable collections, implementing a Custom Writable: Implementing a Raw Comparator for speed, Custom comparators

UNIT-IV

Pig: Hadoop Programming Made Easier, Admiring the Pig Architecture, going with the Pig Latin Application Flow, working through the ABCs of Pig Latin, Evaluating Local and Distributed Modes of Running Pig Scripts, checking out the Pig Script Interfaces, Scripting with Pig Latin, Pig Latin relational operators, User Defined Functions (UDFs), Pig vs MapReduce.

UNIT-V

Applying Structure to Hadoop Data with Hive: Saying Hello to Hive, Seeing How the Hive is Put Together, Hive vs MapReduce, Getting Started with Apache Hive, Examining the Hive Clients, Working with HiveQL: Data Types, Creating and Managing Databases and Tables, Seeing How the Hive Data Manipulation Language Works, Querying: sorting & Aggregation, joins and Analyzing Data, User Defined Functions (UDFs)

Text Books:

1. Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'Reilly
2. Hadoop in Action by Chuck Lam, MANNING Publ
- 3 Hadoop for Dummies by Dirk deRoos, Paul C.Zikopoulos, Roman B.Melnyk, Bruce Brown and Rafael Coss

Reference Books:

1. Hadoop in Practice by Alex Holmes, MANNING Publ
2. Hadoop MapReduce Cookbook, Srinath Perera, Thilina Gunarathne
- 3 Big Java 4th Edition, Cay Horstmann, Wiley John Wiley & Sons, INC

Web Resources:

- 1 Hadoop: <https://hadoop.apache.org/>
- 2 Hive: <https://cwiki.apache.org/confluence/display/Hive/Home/>
- 3 Piglatin: <https://pig.apache.org/docs/r0.7.0/tutorial.html>

**INFORMATION RETRIEVAL SYSTEM
(Elective-I)**

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

1. To provide the foundation knowledge in information retrieval.
2. To equip students with sound skills to solve computational problems.
3. To appreciate the different applications of information retrieval techniques in the Internet or Web environment.

Course Outcomes:

S.No	Outcome	Knowledge Level
1	Students will use Basic Data Structures and Algorithms to retrieve for information	K2
2	Students ability to analyze a sorted array and build an Inverted file	K3
3	Students ability to apply PAT trees for indexing Text documents	K3
4	Students ability to evaluate stemming process for inverted files	K4
5	Student will construct Thesaurus	K3
6	Students will apply latest technologies and Tools for linking, describing and searching the web for information retrieval	K3

SYLLABUS

UNIT-I:

Introduction to Information Storage and Retrieval System: Introduction, Domain Analysis of IR systems and other types of Information Systems, IR System Evaluation. Introduction to Data Structures and Algorithms related to Information Retrieval: Basic Concepts, Data structures, Algorithms

UNIT-II:

Inverted files: Introduction, Structures used in Inverted Files, Building Inverted file using a sorted array, Modifications to Basic Techniques.

UNIT-III:

Signature Files: Introduction, Concepts of Signature Files, Compression, Vertical Partitioning, Horizontal Partitioning.

UNIT-IV:

New Indices for Text: PAT Trees and PAT Arrays: Introduction, PAT Tree structure, algorithms on the PAT Trees, Building PAT trees as PATRICA Trees, PAT representation as arrays.

UNIT-V:

Stemming Algorithms: Introduction, Types of Stemming Algorithms, Experimental Evaluations of Stemming to Compress Inverted Files-Features of Thesauri, Thesaurus Construction

Text Books:

1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
2. Modern Information Retrieval by Yates Pearson Education. 3. Information Storage & Retrieval by Robert Korfhage – John Wiley & Sons.

Reference Books:

1. Kowalski, Gerald, Mark T Maybury: Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.
2. Information retrieval Algorithms and Heuristics, 2ed, Springer

INTERNET OF THINGS
(Elective-I)

Lecture : 3 Periods
Tutorial : 1 Period.
Exam : 3 Hrs.

Int.Marks : 30
Ext. Marks : 70
Credits : 3

Course Objectives:

1. Understand Design principles, Technologies of IOT and different IOT protocols.
2. Acquire Knowledge of different platforms for IOT and design IOT applications and their vulnerabilities with security concerns for IOT.
3. Develop knowledge related to IOT devices and their usage in designing IOT applications with different frame works and platforms.
4. Design different IOT applications as case studies and analyze them.

Course Outcomes:

S.No	Outcome	Knowledge Level
1	Understand and acquire knowledge of the security and ethical issues of the Internet of Things	K2
2	Develop critical thinking and programming skills with Python related to IoT	K3
3	Demonstrate hardware usage and cloud services for IoT application	K4
4	Develop designing knowledge and understand designing case studies for IoT	K3

SYLLABUS

UNIT- I

Introduction to Internet of Things, Definition & Characteristics of IoT, Physical Design of IoT Logical Design of IoT, IoT Enabling Technologies, IoT Levels & Deployment Templates Domain Specific IoTs: Home, Cities, Environment, Energy systems, Logistics, Agriculture, Health & Lifestyle

UNIT- II

IOT & M2M: Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT, 1 Need for IoT Systems Management , Simple Network Management Protocol (SNMP) , Limitations of SNMP, Network Operator Requirements, NETCONF, YANG, IoT Systems Management with NETCONF-YANG, NETOPEER

UNIT- III

IoT Platforms Design Methodology IoT Design Methodology, Case Study on IoT System for Weather Monitoring , Motivation for Using Python , IoT Systems - Logical Design using Python ,Installing Python , Python Data Types & Data Structures ,Control Flow , Functions, Modules, Packages , File Handling I, Date/Time Operations , Classes ,Python Packages of Interest for IoT

UNIT -IV

IoT Physical Devices & Endpoints, Raspberry Pi , About the Board , Linux on Raspberry Pi , Raspberry Pi Interfaces , Programming Raspberry Pi with Python , Other IoT Devices, 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 , Designing a RESTful Web API , Amazon Web Services for ,SkyNetIoT Messaging Platform

UNIT -V

Case Studies Illustrating IoT Design, Introduction, Home Automation, Cities, Environment, Agriculture, Productivity Applications

Textbooks:

1. Internet of Things, A.Bahgya and V.Madisetti, Univesity Press, 2015

Reference Books:

1. Fundamentals of Python, K.A.Lambert and B.L.Juneja, Cengage Learning, 2012.

MULTIMEDIA PROGRAMMING
(Elective-I)

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course objectives:

1. Identify various representation & storage mechanisms of data in computer
2. Design & carryout various formats for data compression.

Course outcomes:

S.No	Outcome	Knowledge Level
1	Students are able to understand various formats of data representation for text, audio, video.	K2
2	Student is able to understand & analyze various compression mechanisms for image, audio, video.	K4

SYLLABUS

UNIT I:

Multimedia Information Representation: Introduction, Digitization Principles – Analog Signals, Encoder Design, Decoder Design. Text – Unformatted Text, Formatted Text, Hyper Text. Images- Graphics, Digitized Documents, Digitized Pictures. Audio – PCM Speech, CD – Quality Audio, Synthesized Audio. Video – Broadcast Television, Digital Video, PC Video, Video Content.

UNIT II:

Text Compression: Compression Principles – Source Encoder and Destination Decoder, Lossless and Lossy Compression, Entropy Encoding, Source Encoding. Text Compression – Static and Dynamic Huffman Coding, Arithmetic Coding.

UNIT III:

Image Compression: Graphics Interchange Format (GIF), Tagged Image File Format (TIFF), Digitised Documents, JPEG.

UNIT IV:

Audio Compression: Differential Pulse Coded Modulation (DPCM), Adaptive Differential PCM (ADPCM), Adaptive Predictive Coding and Linear Predictive Coding, MPEG Audio Coding.

UNIT V:

Video Compression: Principles, H.261 Video Compression, MPEG 1, MPEG 2 and MPEG 4.

Text Book:

1. Halshall, Fred. "Multimedia Communications – Applications, Networks, Protocols and Standards". 2001. Pearson Education.

Reference Books:

1. Chapman, Nigel and Chapman, Jenny. "Digital Multimedia". 2000. John Wiley & Sons.
2. Steinmaetz, Ralf and Nahrstedt, Klara. Multimedia: "Communications and Applications". 2003. Pearson Education.

EMBEDDED SYSTEMS
(Elective-II)

Lecture : 3 Periods
Tutorial : 1 Period.
Exam : 3 Hrs.

Int.Marks : 30
Ext. Marks : 70
Credits : 3

Course Objectives:

1. Analyzing Embedded Systems, Interrupts and Software Architectures.
2. Applying RTOS and Inter Task Communication services.
3. Creating Design issues of RTOS, Embedded Software development Tools.
4. Analyzing Embedded Software Debugging Techniques and Introduction to the IoT.

Course Outcomes:

S.No	Outcome	Knowledge Level
1	Analyzing Embedded Systems, Interrupts and Software Architectures.	K4
2	Applying RTOS and Inter Task Communication services.	K3
3	Design RTOS, Embedded Software development Tools.	K6
4	Analyzing Embedded Software Debugging Techniques and IoT.	K4

SYLLABUS

UNIT-I

Introduction to Embedded Systems: Examples, Typical Hardware, Memory, Microprocessors, Busses; Introduction to 8051 Microcontroller, Architecture, Instruction set, Programming.

Interrupts: Interrupt Basics, Shared-Data problem, Interrupt Latency.

UNIT-II

Software Architectures: Round-Robin Architecture, Round-Robin with Interrupts Architecture, Function-Queue Scheduling Architecture, Real-Time Operating Systems Architecture, Selection of Architecture.

Real Time Operating System: Tasks and Task States, Tasks and Data, Semaphores and Shared Data, Semaphore Problems, Semaphore variants.

UNIT-III

Inter Task Communication: Message Queues, Mailboxes, Pipes, Timer Functions, Events, and Memory Management, Interrupt Routines in RTOS Environment.

Design issues of RTOS: Principles, Encapsulation Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory Space, Saving Power.

UNIT-IV

Embedded Software development Tools: Host and Target Machines, Linker/Locator for Embedded Software, Getting Embedded Software into the Target System.

Embedded Software Debugging Techniques: Testing on your Host Machine, Instruction Set Simulators, Laboratory Tools used for Debugging.

UNIT-V

Introduction to the Internet of Things: History of IoT, IoT Architecture, M2M–Machine to Machine, Web of Things, IoT protocols, The Layering concepts, IoT Communication Pattern, IoT protocol Architecture.

Text Books:

1. The 8051 Microcontroller Architecture, Programming & Applications, Kenneth J. Ayala, Penram International.
2. An Embedded Software Primer, David E. Simon, Pearson Education , 2005.
3. Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems, Marina Ruggieri&HomayounNikookar, River Publishers Series in Communications.

Reference Book:

1. Embedded Systems: Architecture , Programming and Design, Raj Kamal, Tata McGraw- Hill Education, 2008

SOFTWARE PROJECT MANAGEMENT
(Elective-II)

Lecture : 3 Periods
Tutorial : 1 Period.
Exam : 3 Hrs.

Int.Marks : 30
Ext. Marks : 70
Credits : 3

Course Objectives:

1. To study how to plan and manage projects at each stage of the software development life cycle (SDLC)
2. To train software project managers and other individuals involved in software project planning and tracking and oversight in the implementation of the software project management process.
3. To understand successful software projects that support organization's strategic goals

Course Outcomes:

S. No	Outcome	Knowledge Level
1	To understand the basic concepts and issues of software project management	K2
2	To gain knowledge on the principles and techniques of software project management to effectively Planning the software projects	K3
3	To implement the effort estimation & activity Planning Estimation techniques for software projects management	K3
4	To develop the skills for tracking, controlling and creating software deliverables that address real-world management challenges and risks	K4

SYLLABUS

UNIT -I:

Introduction Project, Management, Software Project Management activities, Challenges in software projects, Stakeholders, Objectives & goals Project Planning: Step-wise planning, Project Scope, Project Products & deliverables, Project activities, Effort estimation, Infrastructure

UNIT -II:

Project Approach Lifecycle models, Choosing Technology, Prototyping Iterative & incremental Process Framework: Lifecycle phases, Process Artifacts, Process workflows (Book 2)

UNIT -III:

Effort estimation & activity Planning Estimation techniques, Function Point analysis, SLOC, COCOMO, Use case-based estimation , Activity Identification Approaches, Network planning models, Critical path analysis

UNIT -IV:

Risk Management Risk categories, Identification, Assessment, Planning and management, PERT technique, Monte Carlo approach

UNIT -V:

Project Monitoring & Control, Resource Allocation Creating a framework for monitoring & control, Progress monitoring, Cost monitoring, Earned value Analysis, Defects Tracking, Issues Tracking, Status reports, Types of Resources, Identifying resource requirements, Resource scheduling

Text Books:

1. Software Project Management, Bob Hughes & Mike Cotterell, TATA Mcgraw-Hill
2. Software Project Management, Walker Royce: Pearson Education, 2005.
3. Software Project Management in practice, Pankaj Jalote, Pearson.

Reference Books:

1. Software Project Management, Joel Henry, Pearson Education.

MACHINE LEARNING
(Elective-II)

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

1. Familiarity with a set of well-known supervised, unsupervised and semi-supervised learning algorithms.
2. The ability to implement some basic machine learning algorithms
3. Understanding of how machine learning algorithms are evaluated

Course Outcomes:

S.No	Outcome	Knowledge Level
1	Recognize the characteristics of machine learning that make it useful to real-world Problems.	K2
2	Able to implement various machine learning algorithms as supervised, semi-supervised and Unsupervised.	K4
3	Have heard of a few machine learning toolboxes, Be able to use support vector machines, regularized regression algorithms.	K4
4	Understand the concept behind neural networks for implementing non-linear functions.	K4

SYLLABUS

UNIT- I:

The ingredients of machine learning, Tasks: the problems that can be solved with machine learning, Models: the output of machine learning, Features, the workhorses of machine learning. **Binary classification and related tasks:** Classification, Scoring and ranking. **Beyond binary classification:** Handling more than two classes: Multi-class classification, Regression, Unsupervised and descriptive learning. (Peter Flach)

UNIT- II:

Concept learning: The hypothesis space, Paths through the hypothesis space, Beyond conjunctive concepts. **Tree models:** Decision trees, Ranking and probability estimation trees, Tree learning as variance reduction. **Rule models:** Learning ordered rule lists, Learning unordered rule sets, Descriptive rule learning, First-order rule learning. (Peter Flach)

UNIT- III:

Linear models: The least-squares method: *Univariate linear regression*, The perceptron: a heuristic learning algorithm for linear classifiers, Support vector machines, obtaining probabilities from linear classifiers. **Distance Based Models:** Introduction, Neighbours and exemplars, Nearest Neighbours classification, Distance Based Clustering, Hierarchical Clustering. (Peter Flach)

UNIT- IV:

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

UNIT- V:

Dimensionality Reduction: Principal Component Analysis (PCA), Implementation and demonstration. **Artificial Neural Networks:** Introduction, Neural network representation, appropriate problems for neural network learning, Multilayer networks and the back propagation algorithm. (Tom M. Mitchell)

Text Books:

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

Reference Books:

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

DECISION SUPPORT SYSTEMS
(Elective-II)

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

1. Increase the effectiveness of the manager's decision-making process.
2. Supports the manager in the decision-making process but does not replace it.
3. Ability to select appropriate modelling techniques for supporting semi-structured business decision making
4. Ability to identify and select appropriate decision support systems for generating innovative business solutions.

Course Outcomes:

S.No	Outcome	Knowledge Level
1	Students will understand the any decision support systems	K2
2	Student will analyze the processes and ability to make decision	K3
3	Students can find appropriate models and apply these models for information Quality	K3
4	Students can apply decision support systems on Client/Server Environment	K3

SYLLABUS**UNIT – I:**

Introduction to Decision Support Systems, How Decision Support Systems Evolved-What is a DSS? Why decision Support Systems Matter – DSS Benefits – Why Study DSS?- The plan of This book

UNIT – II:

Human Decision –Making Processes what is a Decision? –The Decision Process, Types of Decision, How Business People make Decision, The Impact of Psychological Type on Decision Making, The Impact of culture on Decision Making

UNIT – III:

Systems, Information Quality. And Models- About Systems- Information Systems Data Flow Diagrams – DSS as Information Systems- Information and Information Quality- Models

UNIT – IV:

Types of Decision Support Systems – the DSS Hierarchy – Generalizing the DSS Categories – Matching DSS to the Decision Type.

UNIT – V:

DSS Architecture, Hardware and Operating Systems platform – Defining the DSS Architecture
The Major Options- DSS on the Central Corporate System- DSS and Client/Server Computing-DSS Software Categories - Standard Packages – Programming Languages DSS

Text Books:

1. Decision Support and Data Warehouse Systems, Efram G. Mallach Mc Graw Hill.
2. Decision Support Systems for Business Intelligence, Vicki L. Sauter, Wiley

Reference Books

1. Decision Support Systems (2nd Edition) George M. Marakas, Prentice Hall

MOBILE COMPUTING LAB

Lab : 3 Periods
Exam : 3 Hrs.

Int.Marks : 50
Ext. Marks : 50
Credits : 2

Course Objectives:

1. To introduce the characteristics, basic concepts and systems issues in mobile and pervasive computing
2. To illustrate architecture and protocols in pervasive computing and to identify the trends and latest development of the technologies in the area
3. To give practical experience in the area through the design and execution of a modest
4. To design successful mobile and pervasive computing applications and services research project
5. To evaluate critical design tradeoffs associated with different mobile technologies, architectures, interfaces and business models and how they impact the usability, security, privacy and commercial viability of mobile and pervasive computing services and applications
6. To discover the characteristics of pervasive computing applications including the major

Course Outcomes:

S.No	Outcome	Knowledge Level
1	To analyze the strengths and limitations of the tools and devices for development of pervasive computing systems	K3
2	To explore the characteristics of different types of mobile networks on the performance of a pervasive computing system	K2
3	To analyze and compare the performance of different data dissemination techniques and algorithms for mobile real-time applications	K3
4	To develop an attitude to propose solutions with comparisons for problems related to pervasive computing system through investigation	K3

LIST OF PROGRAMS

Programming:

1. Write a J2ME program to show how to change the font size and colour.
2. Create a J2ME menu which has the following options (Event Handling):
 - cut - can be on/off
 - copy can be on/off
 - paste - can be on/off
 - delete - can be on/off
 - select all - put all 4 options on
 - unselect all - put all

3. Create a MIDP application, which draws a bar graph to the display. Data values can be given at int [] array. You can enter four data (integer) values to the input text field.
4. Create an MIDP application which examine, that a phone number, which a user has entered is in the given format (Input checking):
 - Area code should be one of the following: 040, 041, 050, 0400, 044
 - There should 6-8 numbers in telephone number (+ area code)
5. Write an Android application program that displays Hello World .
6. Write an Android application program that accepts a name from the user and displays the hello name to the user in response as output using Android studio.
7. Write an Android application program that demonstrates the following:
 - (i) Linear Layout
 - (ii) Relative Layout
 - (iii) Table Layout
 - (iv) Grid View layout
8. Write an Android application program that converts the temperature in Celsius to Fahrenheit.
9. Write an Android application program that demonstrates intent in mobile application development
10. Write an Android application program that demonstrates parsing JSON
 - use following <https://randomuser.me> api to read at least name, gender, email address
11. Introduction to Flutter SDK, Write a hello world application using dat language
12. Write a flutter application to demonstrate any 4 widgets (ex: Text Field, Text, Button...)

Reference Books:

1. Jochen Schiller, “Mobile Communications”, Addison-Wesley, Second Edition, 2009.
2. Raj Kamal, “Mobile Computing”, Oxford University Press, 2007, ISBN: 0195686772
3. Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, “Mobile Computing, Technology Applications and Service Creation” Second Edition, Mc Graw Hill.
4. UWE Hansmann, Lothar Merk, Martin S. Nocklous, Thomas Stober, “Principles of Mobile Computing,” Second Edition, Springer
5. G.Sasibhushana Rao, “ Mobile Cellular Communication” Pearson Publications.

CRYPTOGRAPHY AND NETWORKING SECURITY LAB**Lab : 3 Periods****Exam : 3 Hrs.****Int.Marks : 50****Ext. Marks : 50****Credits : 2****Course Objectives:**

1. To provide deeper understanding into cryptography and countermeasures.
2. To explain various approaches to Encryption techniques, strengths of Traffic Confidentiality, Message Authentication Codes.
3. To familiarize symmetric and asymmetric cryptography.

Course Outcomes:

S.No	Out Come	Knowledge Level
1	Identify basic security attacks and services	K3
2	To use symmetric and asymmetric key algorithms for cryptography	K3
3	To master symmetric and asymmetric cryptography.	K4

LIST OF PROGRAMS**Implement following programs**

1. Breaking the Shift Cipher
2. Breaking the Mono-alphabetic Substitution Cipher
3. One-Time Pad and Perfect Secrecy
4. Message Authentication Codes
5. Cryptographic Hash Functions and Applications
6. Symmetric Key Encryption Standards (DES)
7. Symmetric Key Encryption Standards (AES)
8. Diffie-Hellman Key Establishment
9. Public-Key Cryptosystems (PKCSv1.5)
10. Digital Signatures

Reference Books:

1. Cryptography and Network Security, Behrouz A Forouzan, Debdeep Mukhopadhyay, (3e) Mc Graw Hill.
2. Network Security and Cryptography, Bernard Meneges, Cengage Learning.

SCHEME OF INSTRUCTION & EXAMINATION
 (Regulation R17)
IV/IV B.TECH
 (With effect from **2017-2018** Admitted Batch onwards)
INFORMATION TECHNOLOGY
 (Accredited by NBA)
II-SEMESTER

Code No.	Name of the Subject	Credits	Lect. Hrs	Tut. Hrs	Lab Hrs	Contact Hrs/ Week	Int. Marks	Ext. Marks	Tot. Marks
B17 BS 4201	Management and Organisational Behaviour	3	3	1	--	4	30	70	100
#ELE-III	Elective-III	3	3	1	--	4	30	70	100
B17 IT 4205	Data Mining Lab	2	--	--	3	3	50	50	100
B17 IT 4206	Seminar	2	--	--	--	--	50	--	50
B17 IT 4207	Project work	10	--	--	3	3	60	140	200
Total		20	6	2	6	14	220	330	550

#ELE-III	B17 IT 4201	Cloud Computing
	B17 IT 4202	Cyber Security
	B17 IT 4203	Artificial Neural Networks
	B17 IT 4204	Software Quality Assurance

MANAGEMENT AND ORGANISATIONAL BEHAVIOUR
(Common to CSE & IT)

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

1. To familiarize with the concept of management, functions and principles
2. To provide conceptual knowledge on functional management that is on Human resource management and Marketing management
3. To provide basic insight into contemporary management practices and Strategic Management
4. To learn theories of motivation and also deals with individual behavior, their attitude and perception of individuals
5. To understand about organizations groups that affect the climate of an entire organizations which helps employees in stress management

Course Outcomes:

S.No	Out Come	Knowledge Level
1	Explain management functions and principles	K2
2	Will be able to describe the concepts of functional management that is HRM and Marketing functions	K2
3	Will be able to get discuss about vision, mission, goal, objective and a strategy based on which the corporate planning depends	K2
4	The learner is able to recognise strategically contemporary management practices and describe corporate planning process	K2
5	The learner can discuss about individual behaviour and motivational theories	K2
6	The student can explain about ways in managing conflicts and stress	K2

SYLLABUS

UNIT-I: Introduction to Management:

Management: Concept, Nature and importance of Management, Functions of management, Evolution of Management thought, Taylor's Scientific Management, Fayol's principles of Management, Social Responsibility of Business.

UNIT- II: Functional Management:

Human Resource Management (HRM): Concepts of HRM, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Compensation & Performance Appraisal.

Marketing Management: Concept, Functions of marketing; Marketing Mix - Product, Price, Place & Promotion; Marketing strategies based on Product life cycle, Channels of distribution.

UNIT - III: Strategic Management:

Vision, Mission, Goal, Objective, Policy, Strategy. Elements of Corporate planning process; Environmental scanning; SWOT analysis; steps in Strategy formulation, implementation, evaluation & control; Bench Marking; Balanced Score Card.

UNIT - IV :Organisational Behaviour:

Individual Behavior: Perception-Perceptual process; Attitude-Attitudinal change, Organisational Change, Factors Influencing Change, Types of Change.

Motivation: Meaning, Theories of Motivation - Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory of Motivation.

UNIT - V :Group Dynamics:

Types of Groups, Stages of Group development; **Organizational conflicts** -Reasons for Conflicts, Consequences of Conflicts in Organization, Types of Conflicts, Strategies for Managing Conflicts, Stress - Causes and effects, coping strategies of stress.

TextBooks:

1. Subba Rao.P Management & Organizational Behavior, Himalaya Publishing House. Mumbai
2. A.R Aryasri - Management Science McGraw Hill Pvt Ltd, New Delhi

Reference Books:

1. Fred Luthans Organizational Behaviour, TMH, New Delhi.
2. Robins, Stephen P., Fundamentals of Management, Pearson, India.
3. Kotler Philip & Keller Kevin Lane: Marketing Management 12/e, PHI,
4. Koontz & Weihrich: Essentials of Management, 6/e, TMH

CLOUD COMPUTING
(Elective-III)

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

The student will learn about

1. The cloud environment, building software systems and components that scale to millions of users in modern internet cloud concepts.
2. The capabilities across the various cloud service models including IaaS, PaaS, SaaS.
3. Developing cloud based software applications on top of cloud platforms.

Course Outcomes:

S.No	Out Come	Knowledge Level
1	Understanding the key dimensions of the challenge of Cloud Computing	K2
2	Assessment of the economics, financial, and technological implications for selecting cloud computing for own organization	K3
3	Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications.	K3
4	Assessment of own organizations' needs for capacity building and training in cloud computing-related IT areas	K3

SYLLABUS

UNIT-I : Systems modeling, Clustering and virtualization

Scalable Computing over the Internet, Technologies for Network based systems, System models for Distributed and Cloud Computing, Software environments for distributed systems and clouds, Performance, Security And Energy Efficiency Virtual Machines and Virtualization of Clusters and Data Centers Implementation Levels of Virtualization, Virtualization Structures/ Tools and mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization for Data Center Automation.

UNIT- II: Cloud Platform Architecture

Cloud Computing and service Models, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Inter Cloud Resource Management, Cloud Security and Trust Management. Service Oriented Architecture, Message Oriented Middleware.

UNIT -III: Cloud Programming and Software Environments

Features of Cloud and Grid Platforms, Parallel & Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

UNIT- IV: Cloud Resource Management and Scheduling

Policies and Mechanisms for Resource Management Applications of Control Theory to Task Scheduling on a Cloud, Stability of a Two Level Resource Allocation Architecture, Feedback Control Based on Dynamic Thresholds. Coordination of Specialized Autonomic Performance Managers, Resource Bundling, Scheduling Algorithms for Computing Clouds, Fair Queuing, Start Time Fair Queuing, Borrowed Virtual Time, Cloud Scheduling Subject to Deadlines, Scheduling MapReduce Applications Subject to Deadlines.

UNIT- V: Storage Systems

Evolution of storage technology, storage models, file systems and database, distributed file systems, general parallel file systems. Google file system. Apache Hadoop, Big Table, Megastore, Amazon Simple Storage Service (S3)

Text Books:

1. Distributed and Cloud Computing, Kai Hwang, Geoffry C. Fox, Jack J. Dongarra MK Elsevier.
2. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
3. Cloud Computing, A Hands on approach, ArshadeepBahga, Vijay Madiseti, University Press

Refernce Books:

1. Cloud Computing, A Practical Approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, TMH
2. Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christen vecctiola, S Tammaraiselvi, TMH

**CYBER SECURITY
(Elective-III)**

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

1. The Cyber security Course will provide the students with foundational Cyber Security principles, Security architecture, risk management, attacks, incidents, and emerging IT and IS technologies.
2. Students will gain insight into the importance of Cyber Security and the integral role of Cyber Security professionals.

Course Outcomes:

S.No	Out Come	Knowledge Level
1	Student remember Cyber Security architecture principles and Identify System and application security threats and vulnerabilities	K1
2	Understand different classes of attacks and Cyber Security incidents to apply appropriate response	K2
3	Apply risk management processes, practices and of decision making outcomes of Cyber Security scenarios.	K3

SYLLABUS

UNIT- I: Introduction to Cybercrime:

Introduction, Cybercrime: Definition and Origins of the Word, Cybercrime and Information Security ,Who are Cybercriminals? , Classifications of Cybercrimes, Cybercrime: The Legal Perspectives, Cybercrimes: An Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes, Cybercrime Era: Survival Mantra for the Netizens

UNIT -II: Cyber offenses:

How Criminals Plan Them –Introduction, How Criminals Plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector Cloud Computing.

UNIT -III: Cybercrime Mobile and Wireless Devices:

Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile Computing Era, Laptops.

UNIT -IV: Tools and Methods Used in Cybercrime:

Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks, Phishing and Identity Theft: Introduction, Phishing, Identity Theft (ID Theft)

UNIT -V: Cybercrimes and Cyber security:

Why Do We Need Cyber laws: The Indian Context, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario in India, Consequences of Not Addressing the Weakness in Information Technology Act, Digital Signatures and the Indian IT Act, Information Security Planning and Governance, Information Security Policy Standards, Practices, The information Security Blueprint, Security education, Training and awareness program, Continuing Strategies.

Text Books:

1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole, Sunit Belapure, Wiley.
2. Principles of Information Security, Micheal E.Whitman and Herbert J.Mattord, Cengage Learning.

Reference Books:

1. Information Security, Mark Rhodes, Ousley, MGH.

ARTIFICIAL NEURAL NETWORKS
(Elective-III)

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

1. Understand the role of neural networks in engineering, artificial intelligence, and cognitive modeling.
2. Provide knowledge of supervised learning in neural networks
3. Provide knowledge of computation and dynamical systems using neural networks
4. Provide knowledge of reinforcement learning using neural networks.
5. Provide knowledge of unsupervised learning using neural networks.
6. Provide hands-on experience in selected applications

Course Outcomes:

S.No	Out Come	Knowledge Level
1	Students are able to understand the concepts of ANN'S	K2
2	Students are able to implement perceptron learning	K4
3	Students are able to implement the concepts of feed forward ANN'S, RBF ANN'S	K4

SYLLABUS

UNIT-I: Introduction and ANN Structure.

Biological neurons and artificial neurons. Model of an ANN. Activation functions used in ANNs. Typical classes of network architectures.

UNIT-II

Mathematical Foundations and Learning mechanisms.Re-visiting vector and matrix algebra. State-space concepts. Concepts of optimization. Error-correction learning. Memory-based learning. Hebbian learning. Competitive learning.

UNIT-III

Single layer perceptrons. Structure and learning of perceptrons. Pattern classifier – introduction and Bayes' classifiers. Perceptron as a pattern classifier. Perceptron convergence. Limitations of a perceptrons.

UNIT-IV: Feed forward ANN.

Structures of Multi-layer feed forward networks. Back propagation algorithm. Back propagation - training and convergence. Functional approximation with back propagation. Practical and design issues of back propagation learning.

UNIT-V: Radial Basis Function Networks.

Pattern separability and interpolation. Regularization Theory. Regularization and RBF networks. RBF network design and training. Approximation properties of RBF.

Text Books:

1. Simon Haykin, "Neural Networks: A comprehensive foundation", Second Edition, Pearson Education Asia.
2. Satish Kumar, "Neural Networks: A classroom approach", Tata McGraw Hill, 2004.

Reference Books:

1. Robert J. Schalkoff, "Artificial Neural Networks", McGraw-Hill International Editions, 1997.

SOFTWARE QUALITY ASSURANCE
(Elective-III)

Lecture	: 3 Periods	Int.Marks	: 30
Tutorial	: 1 Period.	Ext. Marks	: 70
Exam	: 3 Hrs.	Credits	: 3

Course Objectives:

1. Describe approaches to quality assurance
2. Understand quality models
3. Evaluate the system based on the chosen quality model

Course Outcomes:

S.No	Out Come	Knowledge Level
1	Describe different approaches to testing software applications	K3
2	Analyze specifications and identify appropriate test generation strategies	K4
3	Develop an appropriate test design for a given test object	K4

SYLLABUS

UNIT I: Introduction:

The Software Quality Challenge. What is Software Quality?
Software Quality Factors: The Components of the Software Quality Assurance System -
Overview **Pre-Project Software Quality Components**

UNIT II:**SQA Components in the Project Life Cycle**

Integrating Quality Activities in the Project Life Cycle, Reviews
Software Testing - Strategies
Software Testing –Implementation, Assuring the Quality of Software Maintenance

UNIT III: Software Quality Infrastructure Components

Procedures and Work Instructions. Supporting Quality Devices Staff Training, Instructing and Certification. Preventive and Corrective Actions.

UNIT IV: Software Quality Management Components

Project Progress Control: Software Quality Metrics, Software Quality Costs

UNIT V: Standards, Certification and Assessment

SQA Standards ISO 9001 Certification Software, Process Assessment

Text Books:

1. Software Quality Assurance, Theory of implementation-Daniel Galin, Pearson
2. MauroPezze and Michal Young, "Software Testing and Analysis. Process, Principles, and Techniques", John Wiley 2008

Reference Books:

1. BorizBeizer, "Software Testing Techniques", 2nd Edition, DreamTech, 2009.
2. Aditya P. Mathur, "Foundations of Software Testing", Pearson, 2008
3. Mauro Pezze and Michal Young, "Software Testing and Analysis. Process, Principles, and Techniques", John Wiley 2008
4. Stephen H. Kan, "Metrics and Models in Software Quality Engineering", 2nd Edition, Pearson, 2003
5. KshirasagarNaik and PriyadarshiTripathy (Eds), "Software Testing and Quality Assurance: Theory and Practice", John Wiley, 2008

DATA MINING LAB

Lab : 3 Periods
Exam : 3 Hrs.

Int.Marks : 50
Ext. Marks : 50
Credits : 2

Course Objectives:

1. Practical exposure on implementation of well known data mining tasks.
2. Exposure to real life data sets for analysis and prediction.
3. Learning performance evaluation of data mining algorithms in a supervised and an unsupervised setting.
4. Handling a small data mining project for a given practical domain

System/Software Requirements:

Intel based desktop PC ·
WEKA TOOL

Course Outcomes:

S.No	Out Come	Knowledge Level
1	Ability to preprocess any data set by applying different preprocessing techniques	K5
2	Ability to process association rules for any given data set by applying Association Algorithms	K5
3	Ability to process classification rules for any given data set by applying classification algorithms	K5
4	Ability to clustering the given data set by applying Partition methods	K5

LIST OF PROGRAMS

1. Demonstration of preprocessing on dataset student.arff
2. Demonstration of preprocessing on dataset labor.arff
3. Demonstration of Association rule process on dataset contactlenses.arff using apriori algorithm
4. Demonstration of Association rule process on dataset test.arff using apriori algorithm
5. Demonstration of classification rule process on dataset student.arff using j48 algorithm
6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm
7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm
8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm
9. Demonstration of clustering rule process on dataset iris.arff using simple k-means
10. Demonstration of clustering rule process on dataset student.arff using simple k- means.

Reference Books:

1. Data Mining- Concepts and Techniques by Jiawei Han, Micheline Kamber and Jian Pei – Morgan Kaufmann publishers ---3rd edition

SEMINAR

Lecture	: --	Int.Marks	: 50
Tutorial	: --	Ext. Marks	: --
Exam	: --	Credits	: 2

For the seminar, each student has to be evaluated based on the presentation of any latest topic with report of 10-15 pages and a PPT of minimum 10 slides. The student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Departmental committee consisting of Head of the department, seminar supervisor and a senior faculty member.

NOTE: Minimum of 50 % of marks is required to pass in seminar. If a student fails to get those minimum marks he/she has to again present the same topic within 2 weeks from the date of earlier presentation.

PROJECT WORK

Lab	: 3 Hrs.	Int.Marks	: 60
Tutorial	: --	Ext. Marks	: 140
Exam	: --	Credits	: 10

Course Outcomes: At the end of the Project Work students will be able to

S.No	Out Come	Knowledge Level
1	Identify a current problem through literature/field/case studies	K3
2	Identify the background objectives and methodology for solving the same.	K3
3	Design a technology/ process for solving the problem.	K6
4	Develop a technology/ process for solving the problem.	K6
5	Evaluate that technology/ process at the laboratory level.	K5

Format for Preparation of Project Thesis for B. Tech:

1. Arrangement Of Contents: The sequence in which the project report material should be arranged and bound should be as follows:

1. Cover Page & Title Page .
2. Bonafide Certificate
3. Abstract.
4. Table of Contents
5. List of Tables
6. List of Figures
7. List of Symbols, Abbreviations and Nomenclature
8. Chapters
9. Appendices
10. References

*The table and figures shall be introduced in the appropriate places.

Note:

Out of a total of 200 marks for the project work, 60 marks shall be for Internal Evaluation and 140 marks for the end semester examination. The end semester examination (VivaVoce) shall be conducted by the committee. The committee consists of an external examiner, Head of the Department and Supervisor of the Project. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project and evaluated by an internal committee.