MCA 101 DISCRETE MATHEMATICS

Unit-I:
Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions. Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

Unit-II:

Unit-III:
Introduction and Basic Concepts : Definition, Representation of graphs, Finite and infinite graphs, Directed graphs, Incidence and degree, Bipartite graph, Planar graphs, Matrix representation of graphs, Applications of graph in computer science. Graphs: Simple graph, multi graph, graph terminology, representation of graphs, Bipartite, Regular, Planar and connected graphs, connected components in a graph, Euler graphs, Hamiltonian path and circuits, Graph coloring, chromatic number, isomorphism and Homomorphism of graphs.
Trees and Fundamental Circuits : Definition, Properties of trees, Spanning trees, Fundamental circuits and cut-sets, Connectivity and separability, Minimal spanning tree and connected algorithms, Rooted and Binary trees, Applications of trees.

Unit-IV:
Tree: Definition, Rooted tree, properties of trees, binary search tree, tree traversal. Shortest Path Problems : Shortest path algorithms, Generalized shortest path algorithms, Applications of shortest path problems.

Unit-V:
Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Universal and existential quantifiers.

Text books
3. “Graph Theory With Applications to Engineering and Computer Science” Prentice Hall, Englewood Cliffs, 1974
MCA 102: PROBABILITY AND STATISTICS

UNIT I:
Probability: Sample space and events – Probability – The axioms of probability – some elementary theorems – conditional probability – Bayes Theorem.

UNIT II:

UNIT III:
Sampling distribution: Population and samples – sampling distributions of mean (Known and unknown) proportions, sums and differences: Point estimation – interval estimation – Bayesian estimation.

UNIT IV:
Test of hypothesis – mean and proportions – Hypothesis concerning one and two means – Type I and Type II errors. One tail, two-tail tests. Test of significance – students t-test, f-test, $x^2$-test. Estimation of proportions.

UNIT V:

TEXT BOOKS:

EDUCATION/PHI REFERENCE BOOKS:

MCA 103: INTRODUCTORY PROGRAMMING

UNIT I:

UNIT II:
Functions – Parameter passing Function prototypes, Scope rules: Arrays, Strings, I/O formatting, Files.

UNIT III:
Basic concepts of Object Oriented Programing – Objects, Classes, Data abstraction, Data encapsulation, Inheritance, Polymorphism, Dynamic binding, Message passing: Object oriented software development – Class diagram, Object diagram, Use case diagram, State chart diagram, Activity diagram.
UNIT IV:
Classes, and Objects in C++, Constructors, and Destructors, Operator overloading. Type conversions, inheritance. Pointers, Memory management – new, and delete operators, Dynamic objects

UNIT V:
Binding, Polymorphism, Virtual functions, Templates, Exception handing, C++ STL-Container classes-Iterators-Programming with predefined template classes.

Text Books:
2. Ray Lischener, C++ in a Nutshell, Oreilly

References Books:

MCA104: COMPUTER ORGANIZATION

UNIT I:

UNIT II:
Machine Instructions and programs: Numbers, Arithmetic operations and characters – Memory locations and address, operations – instructions and instruction, sequencing – addressing modes.

UNIT III:

UNIT IV:

UNIT V:

Text Books:
Reference Books:

MCA 105 : ORGANIZATION, ACCOUNTING AND FINANCIAL MANAGEMENT

UNIT I:

UNIT II:

UNIT III:

UNIT IV:

UNIT V:
Funds flow Analysis – Cash flow Analysis - Ratio Analysis-

Text Book:

Reference Books:
DEPARTMENT OF COMPUTER SCIENCE
MCA SYLLABUS (WITH EFFECT FROM 2015-2016)


MCA 201: COMPUTER ORIENTED OPERATIONS RESEARCH

UNIT-I:

UNIT-II:
Transportation Problem-Transshipment Model-Assignment Problem-Goal Programming - Network Techniques: Shortest-Path Model, Minimum Spanning Tree Problem, Maximum Flow Problem.

UNIT-III:

UNIT-IV:

UNIT-V:
Decision Theory-Steps in Decision Theory Approach-Decision Making Environments-Decision Making under Certainty, Uncertainty and Risk-Decision Tree Analysis-Game Theory.

Reference Books:
2. S.D.Sharma., Operations Research, Kedar Nath Ram Nath, Delhi
5. Kanti Swarup., P.K.Gupta and Mam Mohan, Sultan chand& Sons

MCA 202: PROGRAMMING WITH JAVA

UNIT – I: Object Oriented Programming Fundamentals & Java:

UNIT-II: Packages, Exceptions and Threads:
Packages and Interfaces: Packages, Access protection, Importing packages, interfaces, Exception Handling: fundamentals, exception types, uncaught exceptions, using try, nested
try statements, throw, throws, Java built-in exceptions, user defined exceptions. Multithreading: Thread model, main thread, creating a thread, multiple threads, thread priorities, synchronization, Inter thread communication, String handling.

UNIT-III: Java Utilities:

UNIT-IV: GUI Programming Features
Applets: Applet basics, Applet architecture, an applet skeleton, Applet display method, Repainting, Using Status window, HTML APPLET tag, passing parameters to applet, Audio Clip interface. Even Handling; two event handling mechanisms, Event model, Event classes, sources of events, Event Listener interfaces, Adapter classes. Introduction to SWING: Window Fundamentals, working with frame windows, creating window programs, working with color, fonts, SWING Controls, Layout Managers and Menus: Control fundamentals, Labels, Using buttons, check boxes, checkbox group, choice controls, lists, scroll bars, text field, layout managers, menu bars, and menus.

UNIT-V: Networking in Java
Network Programming with Java, Networking classes and Interfaces, InetAddress, Factory method, Instance Methods, Sockets, Knowing IP address, URL-URL Connection class. Creating a server that sends data, creating a client that receives data, two way communication between server and client, Stages in a JDBC program, registering the driver, connecting to a database, Preparing SQL statements, improving the performance of a JDBC program.

Text Book

Reference Books
2. Thamus Wu: “An Introduction to Object Oriented Programming With Java.” TMH
3. Balagurusamy:”Programming With Java”: TMH.

MCA 203: OPERATING SYSTEMS

UNIT I:

UNIT II:

UNIT III:

UNIT IV:
I/O Systems: overview, I/O hardware, Application I/O interface, Kernel I/O subsystem, Transforming I/O to Hardware operations, STREAMS, Performance of I/O. 

UNIT V:

TEXT BOOKS:

REFERENCE BOOKS:
5. Remy Card, Eric Dumas, Linux Kernal Book , Orielly

MCA 204: DATA STRUCTURES

UNIT I
LINEAR DATA STRUCTURES : Abstract Data Types - Asymptotic Notations: Big-Oh, Omega and Theta – Best, Worst and Average case Analysis: Definition and an example – Arrays and its representations – Stacks and Queues – Linked lists – Linked list based implementation of Stacks and Queues – Evaluation of Expressions – Linked list based polynomial addition.

UNIT II
NON-LINEAR DATA STRUCTURES
;Trees – Binary Trees – Binary tree representation and traversals – Threaded binary trees – Binary tree representation of trees – Application of trees: Set representation and Union-Find operations – Graph and its representations – Graph Traversals – Connected components.

UNIT III

UNIT IV

UNIT V
SEARCHING AND INDEXING: Linear Search – Binary Search - Hash tables – Overflow handling – Cylinder Surface Indexing – Hash Index – B-Tree Indexing.
TEXT BOOKS:

REFERENCES:

MCA 205: DATA BASE MANAGEMENT SYSTEMS

UNIT I:

UNIT II:

UNIT III:
OBJECT- DATABASES AND XML: Complex Data Type-Structured Types and inheritance in SQL-Table Inheritance-Array and Multiset Types in SQL-Object-Identity and Reference Types in SQL-Implementing O-R Features-Persistent Programming Languages – Object-Oriented versus Object-Relational.

UNIT IV:

UNIT V:

Text Book:

Reference Books:


**MCA 301: Management Information Systems**

**UNIT I:**
Managing the digital firm
Why information system? Perspectives on information system Contemporary approach to
Information system Learning to use information systems: New opportunities with technology.
Information System in the Enterprise Major types of system in organization Systems from
functional perspectives Integrating functions and business processes: Introduction to
Enterprise application.

**UNIT II:**
Information Systems, Organizations, management and Strategy Organisations and
Information Systems How information system impact organizations and business firms The
impact of IT on management decision making Information business and business strategy.
Decision making Decision making concepts Decision methods, tools and procedures
Behavioral concepts in decision making Organizational decision making MIS and Decision
Making Concepts.

**UNIT III:**
Information Concepts Information: a quality product Classification of information Methods of
data and Information collection Value of information General model of a human as a
information processor Summary of information concepts and their implications Organization
and information MIS and Information concepts. Development of MIS Development of Long
Range Plans of MIS Ascertaining the class of Information Determining the Information
Requirement Development and Implementation of MIS Management of Quality in MIS
Organisation for development of MIS MIS : the factors for Success and Failure.

**UNIT IV:**
Choice of Information Technology Introduction: Nature of IT decision Strategic decision
Configuration decision Evaluation Information Technology Implementation plan Choice of the
Information Technology and the Management Information System. Enterprise Applications
and Business Process Integration Enterprise Systems Supply chain management systems
Customer relationship management systems Enterprise Integration trends.

**UNIT V:**
Decision Support System DSS: Concept and Philosophy DSS : Deterministic Systems AI
Systems Knowledge based expert system MIS and Role of DSS.

**References:**
education
Management Information Systems, Loudon and Loudon, 10th edition, Pearsons Educations
7. Management Information Systems, Jaswal Oxford Press Case based approach can be
adopted to explain various concepts during tutorials (Internal Evaluation)

**MCA 302: DATA COMMUNICATION AND COMPUTER NETWORKS**

**UNIT – I:**
Introduction, Network models – Internet model, OSI model Physical Layer: Signals – Analog,
Digital, Digital Transmission – Coding, Sampling, Analog Transmission – Modulation of

SRI VENKATESWARA UNIVERSITY, TIRUPATI
digital and analog signal, Multiplexing – FDM, WDM, TDM, Transmission Media – cable, wireless, Circuit switching and Telephone network, DSL Technology, Cable modern, SONET.

**UNIT – II:**
Data Link Layer: Error detection and correction, Data link control and Protocols – Stop and wait, Go-back-n, Selective repeat, HDLC, Point to point access, Channelization, LANS – Traditional Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless LAN’s – IEEE 802.11, Blue tooth, Connecting LANs – Connecting devices, Backbone networks, Virtual LANS, Cellular telephony, Satellite networks, Virtual circuit switching, Frame relay, ATM.

**UNIT – III:**

**UNIT – IV:**

**UNIT – V:**

**Text Books:**

**Reference Books:**

**MCA 303: SOFTWARE ENGINEERING**

**UNIT – I:**

**UNIT-II:**
UNIT -III:
Design Engineering-Design process and quality, design concepts the design model, and pattern-used software design. Architectural design – Software architecture, data design, architectural styles and patterns, architectural design mapping data flow into a software architecture. **Component-based software engineering, Critical systems development, Software reuse, User interface design,** web apps design issues and architecture design.

UNIT -IV:
Testing strategies – Strategies and issues, testing strategies for and object-oriented software. Validation testing and system testing. Software testing tactics – Fundamentals, black-box and white-box testing white-box testing basis path testing, Control structure testing, black-box testing, object-oriented testing methods. Testing methods applicable at the class level inter class testing case design. Testing for specialized environments, architectures and applications, web application testing – concepts, testing process, component level testing.

UNIT - V:
Product metrics – Software quality, framework, metrics for analysis model design model, source case and testing. Managing software projects – The management spectrum, the Ws HH principle, metrics in process, software measurement, metrics for software quality integrating metrics within the software process. Estimation – observations, decomposition techniques, empirical models, estimation for object-oriented projects other estimation techniques, project scheduling, risk management, reengineering, Security engineering, Service-oriented software engineering, Aspect-oriented software development.

**TEXT BOOK:**

**REFERENCE BOOKS:**
1. James F Peters, Software Engineering, John Wiley

**MCA 304: DESIGN AND ANALYSIS OF ALGORITHMS**

**UNIT I:**
Divide – and-Conquer and Greedy Methods.

**UNIT II:**
Dynamic Programming; Basic Traversal and Search Technique.

**UNIT III:**
Backtracking; and Branch-and Bound Technique.

**UNIT IV:**
Lower bound Theory; NP-Hard and NP-Complete Problems

**UNIT V:**
Mesh and Hypercube Algorithms, the Fast Fourier Transform and its Applications.

**TEXT BOOKS:**

**REFERENCE BOOKS:**
1. RCT Lec, SS Teang, RC Change and YT Tsai, Introduction to the Design and Analysis of
MCA 305: TECHNICAL COMMUNICATION AND COMPUTER ETHICS

UNIT I:

UNIT II:
Introduction to Technical Writing – Objective of technical writing Audience Recognition and Involvement, Preparation of Resume, Techniques for writing effective E-mail. Writing User Manuals, Writing Technical Reports and Summaries.

UNIT III:

UNIT IV:

UNIT V:

Text Books:

References Books:
3. Division of Humanities and Social Sciences, Anna University, English for Engineer and Technologists, Vols, 1and 2nd edition, Orient Longman, 2002.
MCA 401: OBJECT ORIENTED SYSTEMS DEVELOPMENT

Unit 1:

Unit II:
Methodology, Modeling , OO analysis and unified modeling language – oo methodologies ; rum Baugh, the booch and Jacobson methodologies patterns, frameworks, and unified approach. Unified modeling language: introduction to UML, UML diagrams and class diagram. Use –case diagram, UML dynamic modifying, oo analysis : use – case driven – object – oriented analysis process – identifying use cases ; use case driven oo analysis : the unified approach, use case model and documentation. Object analysis : classification : theory, approaches for identifying classes, noun phrase, common class pattern, use case driven and classes, responsibility and collaborations. Identifying objects relationships, attributes and methods- super – sub class relationships, a – part – of relationships- aggregation, class responsibility : identifying attributes and methods, defining attributes by analysis use cases and other uml diagrams, object responsibility: methods and messages.

UNIT III :
Philosophy, uml, the purpose, class visibility, refining attributor, designing methods and protocol, access layer: object storage and object interoperability: object store and persistence, review of dbms, database organization: access distributed data base and distribution object complexity, oo dbms, object-relation system, multimedia system. Designing access layer classes. View layer: designing interfacing objects and, designing view layer classes, macro and micro – level process,

UNIT IV :

UNIT V:
Design patters introduction – definition, move, describing design pattern, the catalog and its organization. Solving design problem, select and use a design pattern, design pattern catalog internet, motivation, applicability, structure, participants, collaborations, consequences, implementation, sample code, known use and related patterns of abstract factory, builder, factory method, prototype singleton, adapter, composite, decorator, observer, strategy and template method.

Text Books:
3. Software Architecture Perspective: On an emerging Discipline, Mary Show, David garlan, 1996, PHI.

Reference Books:
1. Simon Bennett, steve Mcrob and Ray farmer object- oriented system analysis and design using uml, second edition, tata mcgraw-hill.
4. Cay horseman, object oriented design and patterns, wiley.

MCA 402: DATA WAREHOUSING AND DATAMINING

Unit – I:
Chapter – I: Data Warehousing & OLAP Technologies [Kambler –chapter 3 (3.1,3.2,3.3)]
Chapter –II: Basic Data Mining Tasks:Classification-Regression-Time series Analysis-Prediction-Clustering-Summarization-Association rules-Sequence discovery-Datamining Versus Knowledge discovery in databases-the development of Data Mining-Data Mining issues-Data mining Metrics-Social Implications of Data Mining-The future. [M.H.Dunhum – chapter 1(1.1 to 1.7)]
Chapter- III: Data Preprocessing [Kambler –chapter 2(2.1 to 2.6)]

UNIT II:
Chapter –I: Basic Data mining Tasks [M.H.Dunhum –chapter 1(1.1 to 1.7)]
Chapter –II: Principles of dimensional modeling-design decisions,Dimensional Modeling basics,E-R Modelung versus Dimensional modeling-use of case tools-The star shema-Review of a simple STAR schema,inside a Dimension table,inside the fact table,inside the factless fact table,Can Granularity-Star Schem keys-primary keys,surrogate keys,foreign keys.Advantages of star schema.
Chapter –III: Dimensional Modeling: Updates to the dimensional tables-Miscellaneous Dimensions-The Snowflake shema-Aggregate fact tables-Families of stars

UNIT-III:
Chapter – I : Classification: Introduction-Issues in classification-Statistical Based Algorithm-Regression-Bayesian Classificaiton-Distance based algorithm-Simple approach-K nearest approach-Decision tree based algorithms-ID3-C4.5 & C5.0-CART-Scalable DT Techniques-Nueral network based algorithms-Propogation-NN Supervised Learning-Radial basis function works-Perceptrons-Rule based algorithms [M.H.Dunhum –chapter 4(4.1 to 4.6)]

UNIT – IV:
Clusterin:

UNIT-V:
Chapter –I:
Chapter –II: Mining objects-spatial, multimedia & text mining, www mining [Kambler chapter10 (10.1 to 10.5)]
Text Books:
1. Data Mining – Introductory & Advanced topics by Margaret H. Dunham,. Pearson Education publishers.
2. Data mining concepts & techniques-Jiawei Han & Micheline Kamber
3. Fundamentals of Data warehousing –Paul raj Ponniah

Reference Books:
2. Oracle 8i – Data Warehousing by Cohen, Abbey, Taub, Tata McGraw Hill

MCA 403: WEB PROGRAMMING

UNIT-I

UNIT-II

UNIT-III

UNIT-IV
Introduction to PHP-Control Structures-Arrays-Functions-Database connectivity-Introduction to ZEND Framework and applications

UNIT-V
Introduction to Java Servlets, Servlet classes and interfaces - Java Database Connectivity-Introduction to JSP-Java Server Page scriptlets -JSP Objects-JSP Web applications

TEXT BOOK:
1. Deitel, Deitel and Goldberg Internet & World Wide Wide how to program”by End. Pearson Education
2. Ivan Bayross, Webenaved commercial Application Development in Java 2.0 BPB.
4. HTML 5 Black book, Kogent Learning Solutions Inc.

REFERENCE BOOKS:

MCA 404A: ARTIFICIAL INTELLIGENCE

UNIT – I:
Introduction about Artificial Intelligence (AI): Problem and search – what is AI technique. Criteria for success; problems, problem space and search – Defining the problem as a state space search, Production systems, Problem characteristics. Production system characteristics.

UNIT- II:
Heuristic search techniques; Knowledge representation – Knowledge representation issues, Using predicate logic, Resolution principle; Representing knowledge using rules – Forward Vs
backward reasoning  Symbolic reasoning under uncertainty  Non monotonic reasoning. Statistical reasoning.

UNIT – III:

UNIT – IV:
Natural language processing – Overview of linguistics. Grammars and languages, Basic parsing techniques, Transitional networks, Semantic analysis and representation structures, Natural language generation, Natural language systems; General concepts in knowledge acquisition - Types of learning, General learning model, Performance measures; Early work in machine learning – Perceptions, Genetic algorithms, Intelligent editors.

UNIT – V:
Expert system architecture – Characteristic features of expert systems, history, Applications, Rule based system architecture, Expert system shells; Pattern recognition – The recognition and classification process, Learning classification patterns, Recognizing and understanding speech; Perception and Action; Features of AI Programming language PROLOG.

Text Books:

Reference Books:

MCA 404 B: SOFTWARE TESTING

UNIT-I:
Building a software Testing strategy, software Test Design Techniques, software Testing tools and selection of Test Automation products.

UNIT-II:
Software Testing Life cycle and software testing process, testing Effort estimation and test planning, software test effort estimation technique.

UNIT-III:
Pre-Development testing: requirements and Design phase, Best practices in program phase: Unit Testing, System Testing and integration testing, case study on acceptance testing.

UNIT-IV:
Implementing and Effective Test Management Process, Building and Effective test organization, performance issues and optimization techniques.

UNIT-V:
Testing of web Based Applications, Testing of Embedded software systems, testing Applications for security, testing Metrics and Bench Marks.

TEXT BOOK:
Ajani and Pradeep Oak, Software Testing, Tata Mc Graw Hill.
MCA 404C: AUTOMATA THEORY

UNIT-I
Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and language recognizers.

UNIT-II
Finite Automata: NFA with \( \epsilon \) transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without \( \epsilon \) transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM”s, Finite Automata with output-Moore and Melay machines.

UNIT-III
Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular Expressions, Pumping lemma of regular sets, closure properties of regular sets (proofs not required)

UNIT-IV

UNIT - V

TEXT BOOKS:
T1 : Hopcroft H.E. & Ullman J.D., „Introduction to Automata Theory Languages and Computation“- Pearson Education

REFERENCE BOOKS:

MCA 404D REMOTE SENSING &GIS

UNIT 1
INTRODUCTION:
Geospatial data, Spatial data infrastructure, three important geospatial technologies, Spatial elements.

UNIT II
COORDINATES & COORDINATE SYSTEMS:
Coordinates and coordinate systems, Datums and geodetic systems, Coordinate
transformations Basic electromagnetic radiation.

DATUMS & GEODE蒂C SYSTEMS:
Geodetic datums, Geodetic reference system, Applications

UNIT III
GLOBAL POSITIONING SYSTEMS:
Introducing the Global Positioning System, Fundamentals of GPS signals and data, GPS
mathematical models, GPS projects: some planning issues.

UNIT IV
PHOTOGRASTY & REMOTE SENSING:
Definition and Scope, History of Photogrammetry and Remote Sensing, Principle, remote
Sensing data acquisition, Remote Sensing data analysis methods, Advantages and
Limitations, Hardware and Software required.

UNIT V
GEOGRAPHIC INFORMATION SYSTEMS(GIS):
Geographic Information Systems (GIS) and science, Fundamentals of Geographic Information
Systems, Geographic data structures, Processing of spatial data Unit.
GIS DATA ANALYTICAL METHODS:
Spatial data and modeling, TIN, DTM, Overlay, Spatial Measurement etc.,
OVERVIEW OF GST APPLICATIONS:
GST for Environmental, Social, Local Government and Commercial applications.

Books:
Publication.
3. Fundamentals of GIS by MICHAEL N DEMERS. Published By john Wiley & Sons Inc.
Stewart

MCA 405 A: E-COMMERCE

UNIT – I:
Electronic Commerce: Electronic Commerce Framework; Electronic Commerce and Media
Convergence; The Anatomy of E-Commerce Application; Electronic Commerce Organization
Applications- The Network Infrastructure for Electronic Commerce: Market Forces
Influencing the I-Way; Components of the I Way; Network Access Equipment; the Last Mlle:
Local Roads and Access Ramps; Global Information Distribution: Networks: Public Policy

UNIT – II:
The Internet as a Network Infrastructure: The Internet Terminology; Chronological History of
the Internet NSFNET: Architecture and Components: Globalization of the Academic Internet;
Internet Governance: The Internet Society –An Overview of Internet Applications –Electronic
Commerce; World Wide Web(WWW) as the Architecture: Web Background: Hypertext
Publishing; Technology behind the Web: Security and the Web- Consumer-Oriented
Electronic Commerce: Oriented Applications; Mercantile Process Models Mercantile Models
from the Consumer's Perspective; Mercantile Models from the Merchant’s Perspective.
Case study: E-Commerce/High Security (Pci)

UNIT – III:
Electronic Payment Systems: Types of Electronic Payment Systems; Smart Cards and
Electronic Payment Systems; Credit Card-Based Electronic Payment systems: Risk and
Electronic Payment Systems Designing Electronic Payment systems – Inter organizational
DEPARTMENT OF COMPUTER SCIENCE
MCA SYLLABUS (WITH EFFECT FROM 2015-2016)

Commerce and EDI: Legal, security, and Privacy Issues: EDI and Electronic Commerce – EDI Implementation, MIME, and Value-Added Networks: Standardization and EDI; EDI Software Implementation: EDI Envelope for Message Transport: Value-Added Networks (VANs); Internet – Based EDI. Case study: Social Media Marketing

UNIT – IV:
Intra organization Electronic Commerce: Internal Information System: Macro forces and Internal Commerce; Work-Flow Automation and Coordination; Customization and Internal Commerce; Supply Chain Management (SCM) – The Corporate Digital Library: Dimensions of Internal Electronic Commerce Systems; Making a Business Case for a Document Library; Types of Digital Document Library; Types of Digital Documents; Issues behind Document Infrastructure; Corporate Data Warehouses. Case study: Email Marketing, Email Personalization

UNIT-V:
M-Commerce: Introduction to Mobile Commerce, Limitations, history, applications, architecture, transaction models, payment methods, advantages, disadvantages. Case study: Mobile app marketing case study: O2 Priority Moments gets small businesses on side

TEXT BOOK:

REFERENCE BOOKS:
5. PaulM-Commerce: Book Your Business with the Power of Mobile Commerce

MCA 405 B: NETWORK SECURITY

UNIT I:

UNIT – II:

UNIT – III:
Public-Key Cryptography, Introduction to Number Theory: Prime Numbers, Modular Arithmetic, Euler’s Theorem, Primary and Factorization, Discrete Logarithms; Message Authentication and Hash Functions – Hash and MAC algorithms.

UNIT - IV:

UNIT – V:
TEXT BOOK
2. Neil Bergman (Author), Mike Stanfield (Author), Jason Rouse (Author), Joel Scambray
3. James Ritting House, Ransome, Cloud Computing, Implementation, Management and
   security, CRC Press

REFERENCE BOOK:
2. Charke Kaufman, Rodia Perlman and Mike Speciner, Network Security

MCA 405C: CYBER SECURITY

UNIT I
FUNDAMENTALS OF CYBER SECURITY
Introduction - Cyber Security and its problem - Intervention Strategies: Redundancy, Diversity
and Autarchy.

UNIT II
ISSUES IN CYBER SECURITY
Private ordering solutions, Regulation and Jurisdiction for global Cyber security, Copy Right-
source of risks, Pirates, Internet Infringement, Fair Use, postings, criminal liability, First
Amendments, Data Loss.

UNIT III
INTELLECTUAL PROPERTY RIGHTS
Copy Right - Source of risks, Pirates, Internet Infringement, Fair Use, postings, Criminal
Liability, First Amendments, Losing Data, Trademarks, Defamation, Privacy - Common Law
Privacy, Constitutional law, Federal Statutes, Anonymity, Technology expanding privacy
rights.

UNIT IV
PROCEDURAL ISSUES
Duty of Care, Criminal Liability, Procedural issues, Electronic Contracts & Digital
Signatures, Misappropriation of information, Civil Rights, Tax, Evidence.

UNIT V
LEGAL ASPECTS OF CYBER SECURITY
Ethics, Legal Developments, Late 1990 to 2000, Cyber security in Society, Security in cyber
laws case. Studies, General Law and Cyber Law - a Swift Analysis.

REFERENCES:

MCA 405D: NEURAL NETWORKS

UNIT I
INTRODUCTION - what is a neural network? Human Brain, Models of a Neuron, Neural
networks viewed as Directed Graphs, Network Architectures, Knowledge Representation,
Artificial Intelligence and Neural Networks (p. no’s 1 – 49) LEARNING PROCESS 1 - Error
Correction learning, Memory based learning, Hebbian learning, (50–55)

UNIT II
LEARNING PROCESS 2: Competitive, Boltzmann learning, Credit Assignment Problem,
Memory, Adaption, Statistical nature of the learning process, (p. no’s 50 – 116) SINGLE
DEPARTMENT OF COMPUTER SCIENCE
MCA SYLLABUS (WITH EFFECT FROM 2015-2016)

LAYER PERCEPTRONS – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perception –convergence theorem, Relation between perception and Bayes classifier for a Gaussian Environment (p. no’s 117 –155)

UNIT III
MULTILAYER PERCEPTRON – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection, (p. no’s 156 –201)
BACK PROPAGATION - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning. (p. no’s 202 –234)

UNIT IV
SELF ORGANIZATION MAPS – Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive pattern classification, Hierarchal Vector quantilizer, contextnel Maps (p. no’s 443 –469, 9.1 –9.8)

UNIT V
NEURO DYNAMICS – Dynamical systems, stavity of equilibrium states, attractors, neurodynamical models, manipulation of attractors’ as a recurrent network paradigm (p. no’s 664 –680, 14.1 –14.6) HOPFIELD MODELS – Hopfield models, computer experiment I (p. no’s 680-701, 14.7 –14.8)

TEXT BOOK:

REFERENCE BOOKS:
1. Artificial neural networks - B.Vegnanarayana Prentice Hall of India P Ltd 2005
2. Neural networks in Computer intelligence, Li Min Fu TMH 2003

MCA 501: COMPUTER GRAPHICS

SEMESTER V

UNIT I
Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, Raster-scan systems, random scan systems, graphics monitors and work stations and input devices Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT II
2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. 2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodgeman polygon clipping algorithm.

UNIT III
3-D Object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces. Basic illumination models, polygon rendering methods.

UNIT IV
3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing
coordinates, view volume and general projection transforms and clipping.

UNIT V
Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications

TEXT BOOKS:

REFERENCE BOOKS:

MCA 502: BIG DATA AND ANALYTICS FOR BUSINESS INTELLIGENCE

UNIT-I
What is Big Data - Varieties of Data - Unstructured data – Trends in Data Storage- Industry Examples of Big Data.

UNIT-II
Big data Technology – New and older approaches- Data Discovery – Open source technologies for Big Data Analytics- Cloud and Big Data –Big Data Foundation-Computation-Limitations-Big Data Emerging Technologies

UNIT-III
Business Analytics- Consumption of Analytics- Creation to Consumption of Analytics-Data visualization by Organizations – 90/10 rule of critical thinking – Decision sciences and analytics-Learning over knowledge-Agility-Scale and convergence-Privacy and security in Big Data.

UNIT-IV

UNIT-V
Hadoop – Components of Hadoop – Hadoop File System –Hadoop Technology Stack-Dataware housing Hadoop Concepts-Applications of Hadoop using PIG,YARN,HIVE.

Text Books
1. Micheal Minnelli,Amibaba Dhiraj,Chambers, Big Data and Big Analytics, Willey and Sons Inc.,
2. Bart Beasens, Analytics in Big Data World, Willey and Sons Inc
3 Sameer Wadker,Madhu Sidhalingaiah and Jason Winner,Apache Hadoop, APress
MCA 503: SYSTEMS PROGRAMMING

UNIT I:
Background introduction, system software and machine architecture, SIC, RISC, and CISC architecture. Assembler: basic assembler functions, machine dependent and independent assembler features, assembler design options, and implementation examples.

UNIT II:
Loading and linkers basic loader junction, machine dependent and independent loader features, loader design options and implementation examples. Macro processors, basic macro processor functions machines – independent macro processor features, macro processor design options, implementation examples.

UNIT III:
Compilers: basic compiler functions, machine dependent and independent compiler features, compiler design options and implementation examples. Other system software: text editors and interactive debugging systems

UNIT-IV
Introduction to Device Drivers, Design issues-Types of Drivers, Character driver-1 and Design issues, Character Driver-2- A/D converter and its design issues, Block driver-1 and its design issues- RAM DISK driver-Anatomy-Prologue of drivers and programming Considerations.

UNIT-V
Introduction to Linux- Linux Architecture- X-windows- Linux administration tools - Commands to use Linux OS- Executing Linux Shell scripts – Shell Programming concepts-Shell scripts.

Text Books:

Reference Books:

MCA 504 A: USER INTERFACE DESIGN

Unit – I:
Human factors of interactive software goals of system engineering and user-interface design, motivations, accommodation of human diversity goal for out profession. Theories, principles, and guidelines – High-level theories, object-action interface model, Principle 1.2 and 3, guide links for data display and data entry, balance of automation and human control. Managing design processes – Usability, design pillars, development methodologies, ethnographic observation, usability testing, surveys, and continuing assessments – expert reviews, usability testing and laboratories, surveys acceptance tests, evaluation during active use, and controlled psychologically oriented experiments.
Unit – II:
Software tools – Specification methods, interface- building tools and evaluation and critiquing tools. Direct manipulation and virtual environments – examples, explanations, programming, visual, thinking and icons Home automation, remote direct manipulation, visual environments. Menu selection, form fill in, and dialog boxes – Task – related organizations item presentation sequence, response time and display rate, fact movement through menus, menu layout, form fill in, and dialog boxes. Command and natural languages – Functionality to support users tasks, command – organization strategies, the benefits of structure, naming and abbreviations, command menus, natural language in computing.

Unit – III:
Interaction Devices – Keyboards and function keys, pointing devices, speech recognition digitization and generation. Image and video displays, printers. Response time and display rate-Theoretical foundations, expectations and attitudes, user productivity, variability. Presentation styles: Balancing function and fashion – error messages, No anthropomorphic design, display design, color, Printed manuals, Online Help and tutorials – Reading from paper versus form displays, preparation of printed manuals, and preparation of online facilities.

Unit – IV:

Unit – V:

TEXT BOOK:
2. Beginning .NET 2.0 by wrox publications (For Unit V).

Reference Books:
3. ASP.NET 2.0 Black Book , Dreamtech publications.
4. VB.NET 2.0 Black Book, Dreamtech publications.

MCA 504 B: ENTERPRISE RESOURCE PLANNING

UNIT–1:
Business Functions, process and Data Requirements, Development of Enterprise Resource planning.

Unit - II:
Marketing Information system and the Sales order process.
Unit – III:
Production and Materials Management System.

Unit – IV:
Accounting and Finance.

Unit – V:
Enterprises Resources Planning and World Wide Web.

TEXT BOOK:

REFERENCE BOOK:

MCA 504C: MOBILE APP DEVELOPMENT

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

UNIT II

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

UNIT IV

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

REFERENCES:
MCA 504D: IT IN FORENSIC SCIENCE

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

References:
2. Peter Wayner, "Disappearing Cryptography: Information Hiding, Steganography and Watermarking 2/e", Elsevier

MCA 505A CLOUD COMPUTING

UNIT I

UNIT II
UNIT III

UNIT IV
PROGRAMMING MODEL: Parallel and Distributed Programming Paradigms – MapReduce, Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments - Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

UNIT V

REFERENCES:
5. George Reese, “Cloud Application Architectures: Building Applications and Infrastructure in the Cloud” O’Reilly

MCA 505 B: IMAGE PROCESSING

UNIT-I:

UNIT-II:
UNIT – III:

UNIT-IV:
Detection of Discontinuities – Edge Linking and Boundary Detection – Threshold- Regarding based Segmentation- Segmentation by morphological watersheds-the Use of Motion Segmentation.

UNIT – V:
Representation – Boundary Descriptors – Regional Descriptors – Use of Principal – Common for Description – Relational Descriptors – Scope and relevance Handwriting – Finger Print – 1 Other state – of the art Technologies.

TEXT BOOK:

REFERENCE BOOKS:
1. Introductory Computer Vision & Image Processing, Mc Graw Hill.
3. B.Chandra, D.Dutta Majmlar, Digital Image Processing PHL

MCA 505 C: SOFTWARE PROJECT MANAGEMENT

Unit -I:

Unit -II:
Project Management concept: People – Product-Process-Project Software process and project metrics: Measures – Metrics and indicators-Software measurements-metrics for software quality-integrating metrics within the software process.

Unit -III:

Unit -IV:
Project scheduling and tracking: Basic concepts-relation between people and effort defining task set for the software project-selecting software engineering task-refinement of major task-defining a task network-scheduling –project plan software quality assurance-quality concepts-software concepts -software reviews-formal technical review –Formal approaches to SQA- software reliability –SQA plan –the ISO 9000 quality standards.

Unit -V:
SRI VENKATESWARA UNIVERSITY, TIRUPATI

DEPARTMENT OF COMPUTER SCIENCE
MCA SYLLABUS (WITH EFFECT FROM 2015-2016)

Text Book:
1. Walker Royce, Software Project management: A unified framework, Pearson Education

References:
1. Pankaj Jalote., Software Project management in practice, Pearson Education
2. Kelkar, S.A., Software Project management: A concise study, PHI
3. Mike Cottorell and Bob Hughes, Software Project management –
4. Sommerville I, Software engineering - , Addison Wesley
5. Robert Futrell, Donald Shafer and Linda I Quality software project management, Person Education

MCA 505D: NATURAL LANGUAGE PROCESSING WITH PYTHON

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

**TEXT BOOKS:**
1. "Speech and Language Processing": Jurafsky and Martin, Prentice Hall
2. "Statistical Natural Language Processing"- Manning and Schutze, MIT Press

**REFERENCES BOOKS:**

**SIXTH SEMESTER**

**MAJOR PROJECT WORK:**
1. Project Seminar (Internal) : 50 Marks
2. Project Report (Internal) : 50 Marks
3. National / International Conference Publication Proceedings (External) : 50 Marks
   (paper based on project should be submitted to conference and published in the form of proceedings)
4. National / International Journal Publication (External) : 50 Marks
   (paper based on project should be submitted to the journal and should be published)
5. Viva Voce (External) : 50 Marks
6. Project Execution (External) : 50 Marks