DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

Revised Syllabus of

Master of Computer Application

[M.C.A.]

Semester- III & IV

(Effective from 2010-11 & onwards]

THIRD SEMESTER

Paper No	Title	Weekly Th	Weekly Pr	Credit Th	Credit Pr	Marks Theory	Marks Sessional or Practical S	Marks Sessional or Practical Pr	Total Marks	Duration Theory Exam
XI	Visual Programming	3	4	3	2	60		40	100	2 Hrs
XII	Computer Communication Networks	5	-	5	-	60	40	-	100	2 Hrs
XIII	Accounting & Management Control	3	4	3	2	60	-	40	100	2 Hrs
XIV	I T Elective I	3	4	3	2	60	-	40	100	2 Hrs
XV	Resource Management Techniques	5	-	5	-	60	40	-	100	2 Hrs
	Total	19	12	19 + 6 = **25**		300	80	120	500	--

PAPER XI - - VISUAL PROGRAMMING

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Unit I – Introduction to Windows Program, Message Processing in Windows Programming, Message Boxes, Menu and Accelerators. Dialog Box. Creating Icons, Cursor and Bitmaps. Static Control, Radio Buttons, Scroll Bars, Advance Window Controls, Toolbars, Progress Bar, Tree View, Tab Controls, Text and Font.

Unit II – Visual C++ Basics, Introduction, Building a Basic Application, SDI and MDI, View Document Architecture Using Microsoft Foundation Class (MFC) Library, Visual C++ Resources, Application Wizard, Accelerators and Menus, Toolbars.

Unit III – Visual C++ and Database Management: MFC Programming without View Document Architecture. Data Access Objects (DAO), ActiveX Data Objects (ADO), Open Database Connectivity (ODBC), Database Building Overview, Building a Database Application using ODBC, DAO, ADO.

Books:-

1. Windows Programming by Charles Petzold, Microsoft Press.
2. Windows Programming by Herbett Schildtz, TMH.
3. VC++ by Murray, TMH.
4. Introduction to VC++ by Steve Holzner.
5. Chapman, “Teach Yourself Visual C++ 6 in 21 Days”, Techmedia, 2008.
6. Pappar C.H., “The Complete Reference-Visual C++ 6”, TMH, 2005.
7. Young, “Mastering Visual C++”, BPB Publications, 2003.
8. Kanetkar Y., “Visual C++ Programming”, BPB Publications, 1998.

Laboratory Work

Writing of programs using Visual C++ Programming Language. Exercises to study various features of the languages, Emphasis should be on writing application oriented

programs. Mini project covering well structured modular and readable programs with good documentation can be undertaken.

PAPER XII - - COMPUTER COMMUNICATION NETWORK

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Introduction to computer network

Advantages of networks, structure of the communications network, point-to-point and multi drop circuits, data flow and physical circuits network topologies, topologies and design goals. Hierarchical topology horizontal topology (bus), star topology, ring topology, mesh topology. The telephone network, switched and non switched options, fundamentals of communications theory, channel speed and bit rate , voice communications and analog wave forms, band width and the frequency spectrum, connecting the analog and digital worlds digital worlds, digital signals, the modem, asynchronous and synchronous transmission.

Wide area and local networks, connection oriented and connectionless networks, classification of communications protocols, time division multiple access (TDMA), time division multiplexing(TDM), carriers sense (collision systems, token passing , peer-to-peer priority systems; priority slot, carrier sense (collision free) systems, token passing (priority) systems.

Layered protocols and the OSI model

Goals of layered protocols, network design problems, communication between layers introduction to standard organization and the OSI model, standards organization , layers of OSI status.

Polling / Selection protocols

Character and bli8t protocols, blina4y synchronous control (BSC), HDLC, HDLC options. HDLC frame format code transparency and synchronization, HDLC transmission process, HDLC subsets, SDLC, protocol conversion

Local area networks

Why LANs? Primary attributes of primary attributes of the LAN Broad and the base band and base LANs IEEE LANs stand and eleactionship of the 802 standard to Iso/CCITT modal,connection options with LANs, LLC and MAC topologies data units, LAN topologies and protocols CSMA/cd asnd IEEE802.3 ,token ring (priority) token bas and IEEE 802.4, metropolitan area network (MANs) ANSI fiber distributed data interface .

Switching and Routing in networks

Message switching, package switching, when and when not to use packet switching, packet routing package switching, support to- circuit switching networks The x.25 Network. And supporting protocols.

Feature of the x.25 features and physical Layers, x.25 and data layer, companion standard to x.25 channel option ,flow control principles ,other packet types X,25 logical channel states ,packet format internetworking connections modes network ,the frame relay and x.25 stack

TCP/IP

TCP/IP and internet working example of the TCP/IP operation, related protocols port and sockets, the IP address major feature of the TCP, passive and active operation ,the transmission control block (TCB) route discovery protocols examples of the route discovery protocols, application layer protocols.

Personal Computer Networks

Personal computer communication characteristics error handling using the personal computer as server linking the personal computer to the mainframe computer , file transfer to the personal computer and local area network , network operating system (Nos.) common IBM PC LAN protocol stack

Books:-

1. Black, “Computer Networks”, 2e, PHI, 2008.
2. Kurose, “Computer Networking-A top down approach featuring the Internet”, 3e, Pearson Education, 2008.
3. Bragg, “Network Security-The Complete Reference”, TMH, 2008.
4. Peterson, “Computer Networks”, 3e, Morgan Publications, 2008.

5. Leon-Garcia, “Computer Communication Networks”, 2e, TMH, 2008.
6. Forouzan, “Data Communication and Networking”, 5e, TMH, 2008.
7. Tenenbaum, “Computer Networks”, 4e, PHI, 2007.
8. Gupta, “Data Communication and Computer Networks”, 2e, PHI, 2007.
9. Brijendra Singh, “Data Communication and Computer Networks”, 2e, PHI, 2007.
10. Sybex, “Networking Complete”, 2e, BPB Publications, 2007.
11. Starlings w.' computer communication network (4th edition) prentice hall of the India 1993

Laboratory Work for Sessional Marks

- Study of the operation of FSK/MSK modem by varying the data rate and measuring error rate in random noise.
- Study of asynchronous and synchronous communication.
- Study of the performance of Stop and Wait and sliding windows protocols
- Study of different routing protocols.
- Study of Remote procedure call under Client-Server environment.
- Study of different application standards in the areas of
    - file transfer access and management
    - remote logging and virtual terminals
    - E-mail systems
    - Directory services
- Study of network performance and management using an SNMP. Compliance network managers.

PAPER XIII - - ACCOUNTING AND MANAGEMENT CONTROL

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Introduction to Accounting
Concept of Accounting, Functions of Accounting, Importance of Accounting, Limitations of Accounting, Concept of Generally Accepted Accounting Principles, Accounting Concepts, Accounting Conventions, Accounting as an Information System, Users of Accounting Information.

Accounting Cycle
Meaning of Accounting Cycle, Classification of Accounts, Rules of Debit and Credit, Journal Ledger and Trial Balance, Recognition of expenses, Recognition of revenue, Financial Statements (Balance Sheet, Profit and Loss Statement).

Computerized Accounting
Accounting Software Packages, Features of Computerized Accounting, Advantages of Computerized Accounting, Difference between Manual Accounting System Vs Computerized Accounting System, Introduction to Tally.

Valuation of Assets
Depreciation Accounting: Meaning, Depreciation, Depletion and Amortization, Methods of Depreciation, Provisions and Reserves.
Inventory: Meaning of inventory, Types of Inventory, Methods of Inventory Valuation, Techniques of Inventory Management, and Levels of Inventory.

Statement of Changes in Financial Position
Fund flow statement, Cash Flow Statement, Difference between Fund flow statement and Cash Flow Statement.

Decision Making and Control
Cost Accounting : Concept of Cost, Elements of Cost, Classification of Costs, Relevant cost and Decision Making, Pricing Decision, Make or Buy Decision, Break-even Analysis, Absorption Costing, Marginal Costing, Marginal Costing Vs Absorption Costing, Standard Costing, Labor Cost, Variances, Overhead, Budgeting and Budgetary Control, Benefits of Budgetary Control, Zero Base Budgeting, Traditional Budgeting Vs Zero Base Budgeting, Responsibility Centre's, Types of Responsibility Centre's(Cost, Revenue, Profit,

Investment), Responsibility Performance Reporting, Transfer Pricing, Management By Objectives, Measuring Divisional Performance, Non – Financial Measures of Performance.

Books:-

1. Dr. Sakshi Vasudevan.” Accounting For Business Managers”, Himalaya Publishing House.
2. Dr. Jawaharlal; “Accounting For Management”, Himalaya Publishing House.
3. Bhattacharya, S.K. and Dearden, John. “Accounting for Management “, prentice Hall of India, New Delhi.
4. Chadiwick.” The Essence of Financial accounting”, prentice Hall of India Pvt. Ltd., New Delhi.
5. Horngren, Sundem and Selto (9^{th} ed),”Introduction to management accounting “, prentice Hall of India, New Delhi.
6. Welch, Hilton and Gordon (5^{th} ed) “Budgeting: Profit planning and control”, prentice Hall of India, New Delhi.

Sessional Marks:

At least four(4) problems should be given on each topic. Solution should be presented by the student along with detailed justification of solution.

PAPER XV - - RESOURCE MANAGEMENT TECHNIQUES

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Unit I – Project Management Framework: Overview of project Management, Project Organization, Planning a s/w project, Project management life cycle, Risk management, Identification of Risks, Risk Analysis, Risk Planning & Monitoring.

Unit II – S/w Project Estimation: Project Estimation, Different methods of estimation (COCOMO model, Delphi cost estimation, etc.), Function point analysis.

Unit III – Project Management Tools & Techniques: PERT & Gantt Charts, Introduction to Microsoft Project.

Unit IV – Configuration Management (CM): CM planning, Change Management, Version and Release Management, Configuration Management Tools.

Unit V – S/W Team Management: Characteristics of Performance management, High performance Directive and collaborative styles, Team Structure, Team Communication, Managing customer expectations, Group Behavior.

Books:-

1. Software Project management Edwin Bennatan
2. Software Engineering Roger S. Pressman
3. Software Engineering concepts Richard Fairley
4. Software Project Management S.A. Kelkar
5. Software Engineering IAN Sommerville
6. System Analysis and Design Methods Whitten, Bentley and Dittman

Sessional Marks:

At least ten (10) assignments based on theory.

FOURTH SEMESTER

Paper No	Title	Weekly Th	Weekly Pr	Credit Th	Credit Pr	Marks Theory	Marks Sessional or Practical S	Marks Sessional or Practical Pr	Total Marks	Duration Theory Exam
XVI	Artificial Intelligence	3	4	3	2		-	40	100	2 Hrs
XVII	Management Support System	5	-	5	-		40	-	100	2 Hrs
XVIII	Web Technologies & .net	3	4	3	2		-	40	100	2 Hrs
XIX	IT Elective II	3	4	3	2		-	40	100	2 Hrs
XX	Information System Analysis & Design	5	-	5	-		40	-	100	2 Hrs
	Total	19	12	19 + 6 = **25**			80	120	500	--

PAPER XVI - - ARTIFICIAL INTELLIGENCE

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Unit I – Scope of AI: Games, Theorem Proving, Natural Language Processing, Vision and Speech Processing, Robotics, Expert Systems, AI Techniques – Search Knowledge, Abstraction. Problem Solving (Blind): State Space Search; Production Systems, Search Space Control; Depth-First, Breadth-First Search. Heuristic Based Search: Heuristic Search, Hill Climbing, Best-First Search, Branch and Bound, Problem Reduction, Constraint Satisfaction End, Means-End Analysis.

Unit II – Game Playing: Game Tree, Minimax Algorithm, Alpha Beta Cutoff, Modified Minimax Algorithm, Horizon Effect, Futility Cut-off. Knowledge Representation: Predicate Logic, Unification, Modus Ponens, Modus Tollens, Resolution in Predicate Logic, Conflict Resolution Forward Chaining, Backward Chaining, Declarative and procedural Representation, Rule Based Systems. Structured Knowledge Representation: Semantic Nets, Slots, Exceptions and Default Frames, Conceptual Dependency, Scripts.

Unit III – Handling Uncertainty: Non-Monotonic Reasoning, Probabilistic Reasoning, Use of Certainty Factors, Fuzzy Logic. Natural Language Processing: Introduction, Syntactic Processing, Semantic Processing, Pragmatic Processing.

Unit IV – Learning: Concept of Learning, Learning Automation, Genetic Algorithm, Learning by Inductions, Neural nets. Expert Systems: Need and Justification for Expert Systems, Knowledge Acquisition, Case Studies: MYCIN, RI.

Books:

1. E. Rich and K. Knight, “Artificial Intelligence”, TMH.
2. N. J. Nilsson, “Principles of AI”, Narosa Publication House.
3. M. N. Hoda, “Foundation Course in Artificial Intelligence”, Vikas Publication.
4. P. H. Winston, “Artificial Intelligence”, Pearson Education.

5. D. W. Patterson, “Introduction to AI and Expert Systems”, PHI.
6. R. J. Schalkoff, “Artificial Intelligence – An Engineering Approach”, McGraw Hill International Edition Singapore.
7. M. Sasikumar, S. Ramani, “Rule Based Expert Systems”, Narosa Publishing House.

Laboratory Work

The laboratory should use languages such a PROLOG to solve the laboratory exercise. It is also suggested that an expert system shell such as ITTM rule be used to create a small expert system for, say, trouble shooting moped. VCR etc. some suggested experiments are: Tour of India, stable marriage problem, game playing (Such as Bridge), coin change problem etc.

PAPER XVII - - MANAGEMENT SUPPORT SYSTEM

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Management Support System an Overview: Managers and Decision Making; Managerial Decision Making and Information Systems; Computerized Decision Support and Supporting Technologies; Benefits of MSS.

Decision Support Systems: Introduction to the concept of Decision Support System; Components of DSS; Dialogue Management; Data Management and Model Management for DSS; Types of DSS, Systems Analysis and Design for DSS; Models in the context of DSS; Algorithms and Heuristics; DSS Applications in different functions; Design of interfaces in DSS; An overview of DSS generators; Group Decision in Support Systems (GDSS) and Decision Conferencing. Expert Systems: Introduction of Expert Systems; Expert Systems in Management. MSS based on GIS; Executive Information Systems (EIS). Web-based intelligent systems.

References:

1. E. Turban,, J. Aronson; " Decision Support Systems and Intelligent Systems"; Prentice Hall
2. Bhatnagar, S.C. and Ramani K.V. " Computers and Information Management", Prentice Hall of India, New Delhi, 1992.
   Issue dedicated of GSS & Expert Systems, JMIS, 10.3.1993-94.
3. Kroenke, D., Management Information Systems. 2nd edition, Mitchell Mcgraw Hill, New Yor, 1992;
4. Lucas, H.C. "Information system concepts for Management", 5th edition, Mc Graw Hill, New York, 1994.
5. Maryam Alvi, " Group Decision support systems, Information System Management (ISM)", vol 8, No. 3 Summer 91.
6. Sprauge, R.H. and Mc Nurlin, B.C. "Information System concepts for Management in Practice". 3rd Edition. Prentice Hall Intenational, New Jersey, 1993.
7. Sprague, R.H. and carlson, E.D. "Building Effective Decision Supports Systems". Prentice Hall New Delhi, 1982.

Sessional Marks

Student should submit a case study based on topics covered in theory. Marking shall base on originality of work.

PAPER XVIII - - WEB TECHNOLOGIES & .NET

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Unit I – Website Designing, Overview of Internet and Intranet Services, Static and Dynamic Web Pages, Introduction to HTML, DHTML, ASP, JavaScript.

Unit II – The .NET Framework, .NET programming Framework, .NET Languages, .NET Class Library, About ASP.NET, Basic Difference between C# and VB.NET, .NET Framework Base Classes, User and Program Interfaces, Windows Forms, Web Forms, Console Applications, Web Services, CLR (Common Language Runtime).

Unit III – Introduction to C Sharp, main Method, Program Output, Printing and Formatting Output, Compilation and Execution, Namespace Declaration, Common Language Platform, General Structure of C Sharp Program, Value Type, Default Constructor, Struct Type, Enumeration Type, Reference Type, Class Type, Object Type, String Type, Interface Type, Array Type, Delegate Type, Predefined Types, Concept of Boxing and Unboxing, Array Types, Variables and Parameters, Operands, Statements, Expression, Operators.
C Sharp Objects, Classes, Objects as Data Type, Creating Classes, Using an Object Member Function, Providing Constructor, Types of Class Members, Inheritance, Controlling Access to Member of Class, Garbage Collector, Implementing Classes, Class Library and Name Space, Methods, Structure of a Method, Method Overloading, Implementing Method, Class Containing Functions, Statements and Control.

Unit IV – Introduction to ASP.NET, ASP.NET Classes, Web Form Fundamentals: A Simple Applets, Improving the Currency Converter, HTML Control Classes, Page Class, Assessing HTML Server Controls. Web Controls: Basic Web Control Classes, Auto PostBack and Web Control Events, A Web Page Applets. Validation and Rich Controls. State Management. Tracing, Logging and Error Handling – Common Errors, .NET Exception Object, Handling Exceptions, Throwing Your Own Exceptions, Logging Exceptions, Error Pages, Page Tracing.

Books:

1. Rick Dranell, "HTML 4 Unleashed", Techmedia Publication.
2. Shelley Powers, "Dynamic Web Publishing", Techmedia Publication.
3. Matthew MacDonald, "The Complete Reference – ASP.NET", Tata McGraw Hill.
4. Schildt, "C# (C Sharp) Complete Reference", Tata McGraw Hill.
5. David Platt, "Introducing Dot Net", PHI Publication.
6. James Conard et. Al., "Introduction to DOT NET (.NET)", Shroff Publisher and Distributor Pvt. Ltd.
7. Balguruswamy, "Programming in C#", Tata McGraw Hill.
8. V. K. Jain, "C# (C Sharp) Programming", Dreamtech Press.

Laboratory Work

- Working with MSIL, Metadata and Namespace.
- Usage of CLR, CTS and CLS.
- .NET Application using Command Line Compiler.
- .NET Application using Visual Studio.NET IDE.
- Simple ASP.NET Applications.
- Creating Web Forms Application Projects.
- Usage of Web Controls.
- Working with Events.
- Usage of Rich Web Controls.
- Usage of Validation Controls.
- Configure ASP.NET Applications.
- Creating and using Business Objects.
- Creating Assemblies.
- Using the HTTP Handler Class in Web Application.
- Forms Based Authentication.
- Creating and Testing a Web Service.
- Creating a Consumer Application.
- Building a Simple Database Application using Data Adapter.
- Application using OleDb Managed Providers.

PAPER XX -
INFORMATION SYSTEM: ANALYSIS, DESIGN AND IMPLEMENTATION

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Overview of Systems Analysis and Design: System Development Life Cycle. Concept and Models: requirement determination, logical design, physical design, test planning implementation planning and performance evaluation; communication, interviewing, presentation skill, group dynamics: risk and feasibility analysis; group-based approaches. JAD, structures walk through and design and code reviews; prototyping; database design; software quality metrics: application categories software package evaluation and acquisition. Information requirement Analysis: Process modelling with physical and logical data flow diagrams data modelling with logical entity relationship diagrams;

Developing a Proposal: Feasibility study and cost estimation.

System Design: Design of input and control, designee of output and control, file design database design, Process design, user interface design; prototyping; software constructions; documentation.

Application Development Methodologies and CASE tools: Information engineering, structured systems analysis and designee and object oriented methodologies for application development data modeling, process modeling, user interface design and prototyping ; use of computer aided software engineering (CASE) tools in the analysis, design and implementation of information systems.

Design and Implementation of OO platforms: Object oriented analysis and design through object model technique, object modeling, dynamic modeling and functional modeling object oriented, object oriented design and object oriented programming systems for implementation, object oriented data bases.

Managerial Issues in Software Projects: Introduction to software markets; planning of software projects, size and cost estimations; project scheduling; measurement of software quality and productivity; ISO and capability maturity models for organization growth.

The course should be based on lectures, case analysis and laboratory work. Cases should be used to illustrate each major topic in the course.

Books:-

1. V. Rajaraman, "Analysis and Design of Information Systems", 2e, PHI, 2008.
2. Whitten, Bentley, "Systems Analysis and Design Methods", 7e, TMH, 2007.
3. Senn, "Analysis and Design of Information Systems", McGraw Hill International Edition, 2003.
4. Hawryszkiewycz, "Systems Analysis and Design", 4e, PHI, 2002.

Laboratory Work for Sessional Marks

Should consist of the analysis and design of at least one business application like accounting system, banking, transportation, manufacturing, non manufacturing industries, retailing, hospital, etc by the student (may not include implementation part).

FIFTH SEMESTER

Paper No	Title	Weekly Th	Weekly Pr	Credit Th	Credit Pr	Marks Theory	Marks Sessional or Practical S	Marks Pr	Total Marks	Duration Theory Exam
XXI	ERP Domain	3	4	3	2	60		40	100	2 Hrs
XXII	Software Engineering	5	-	5	-	60	40	-	100	2 Hrs
XXIII	Data Mining & Data Ware housing	3	4	3	2	60	-	40	100	2 Hrs
XXIV	IT Elective III	3	4	3	2	60	-	40	100	2 Hrs
XXV	Probability & Combination	5	-	5	-	60	40	-	100	2 Hrs
	Total	19	12	19 + 6 = **25**		300	80	120	500	--

PAPER XXI - - ERP DOMAIN

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Unit I – Enterprise Resource Planning: Introduction, What is ERP?, Need of ERP, Evolution of ERP, Advantage of ERP, Growth of ERP, Risks of ERP.

Unit II – ERP and Related Technologies: Business Process Re-Engineering (BPR), Management Information System (MIS), Decision Support System (DSS), Executive Support System (ESS), Data Warehousing, Data Mining, On-Line Analytical Processing (OLAP), Supply Chain Management (SCM), Customer Relationship Management (CRM) , Product Life Cycle Management (PLM).

Unit III – ERP Modules and Vendors: Finance, Production, Human Resource Management, Plant Maintenance, Materials Management, Marketing, Sales and Distribution, Quality Management. ERP Market: SAP AG, Oracle Corporation, Sage Group, Microsoft Business Solutions, SSA Global, PeopleSoft, JD Edwards, Baan.

Unit IV – ERP Implementation Life Cycle: Evaluation and Selection of ERP Package, Project Planning, Gap Analysis, Implementation Team Training, End User Training, Testing, Going Live, Evaluation and Maintenance.

Unit V – Case Studies: Post Implementation Review of ERP Packages in Manufacturing, Services and Other Organizations.

Books:-

1. Alexis Leon, “ERP Demystified”, TMH.
2. V. K. Garg & N. K. Venkita Krishnan, “ERP Ware: ERP Implementation Framework”.
3. V. K. Garg & N. K. Venkita Krishnan, “ERP Concepts & Planning”.

Laboratory Work

Through study and practical experience, of Customization and Implementation of at least one ERP module. Open Source ERP Solutions like Compiere, ERP5, Open ERP, etc can be used.

PAPER XXII - -SOFTWARE ENGINEERING

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Software Life Cycle:

Models: Waterfall, Spiral, Prototyping Fourth Generation Techniques, SW Process. Software requirements specification (SRS). Fact Finding, Techniques, Characteristics of good SRS: Unambiguous. Verifiable Consistent. Modifiable, traceable and usable during the operation and the maintenance has prototype outline for SRS

SW inspection

Communication skills for system analyst. Review/Inspection Procedure:

Documents composition of the inspection team checklist, reading by the Inspectors Recording of the defects and action recommended. Students should practice inspecting small requirement specification for good characteristics.

System Analysis.

SA tools and techniques, DFD, entry relationship diagrams project dictionary.

SW Design.

System design tools and the technique prototyping structured, programming.

User interface design

Elements of good design, Design issue feature of a modern GUI, menus, scrolling, windows, icons, panels, error messages etc.

User Manual.

User profile, contents of an user manual: student is urged to install and use a software using it's user manual and report the strength and weakness of that user manual.

Software Configuration Management

Base line, SCM process, Version Control, change Management.

Computer Aided Software Engineering.

CASE, Tools for Project Management Support, Analysis & Design, Programming, Prototyping, Maintenance, Future of CASE.

References

1. Pressman, "Software Engineering-A Practitioner's Approach", 6e, McGraw Hill International Ltd., 2008.
2. Pankaj Jalote, "An Integrated Approach to Software Engineering", 3e, Narose Publishing House, 2007.
3. Fairly, "Software Engineering Concepts", 1e, TMH, 2008.
4. Aggarwal, "Software Engineering", 3e, New Age Publications, 2008.
5. Kelkar, "Software Engineering-A Concise Study", PHI, 2007.
6. Perry, "Effective Methods of Software Testing", 3e, Wiley India Ltd., 2008.

Laboratory Work for Sessional Marks

The lab sessions will have experiments on the following:

- **CASE tools:** Use of diagramming tools for system analysis, such as Turbo analyst, for preparing Data Flow diagrams and E-R diagrams, use of tools for relational database design such as relational Designer.
- **Application Development Tools:** Use of tools such as Power Builder, Delphi, Magic etc. in developing application software including interactive data-entry screens, transaction processing, report generations, etc.

References

- Products manuals from concerned vendors.

PAPER XXIII - - DATA MINING & DATA WAREHOUSING

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Unit I – Characteristics of a Data Warehouse, Data Mart, Types of Data Mart, Loading a Data Mart, Metadata for a Data Mart, Data Model for a Data Mart, Maintenance of a Data Mart, Nature of Data in a Data Mart, Software Components for a Data Mart, Tables in Data Mart, External Data, Reference Data, Performance Issues, Monitoring Requirements for a Data Mart, Security in Data Mart.

Unit II – OLTP and OLAP Systems, Data Modeling, Star Schema for Multidimensional View, Multifact Star Schema, Categories of OLAP Tools, Managed Query Environment (MQE), Cognos Powerplay, IBI Focus Fusion, Pilot Software, Arbor Web, Information Advantage Web, Micro Strategy DSS Web, Brio Technology, OLAP Tools and the Internet.

Unit III – Data Mining: Introduction, From Data Warehouse to Data Mining, Steps of Data Mining, Data Mining Algorithms, Database Segmentation, Predictive Modeling, Link Analysis, Tools for Data Mining.

Unit IV – Developing a data Warehouse, Building a Data Warehouse, Data Warehouse Architectural Strategies, Design Considerations, Data Content, Metadata, Distribution of Data, Tools for Data Warehousing, Performance Considerations, Crucial Decisions in Designing a Data Warehouse, Various Technological consideration.

Books:

1. C. S. R. Prabhu, “Data Warehousing”, PHI.
2. Mattison, “Web Warehousing & Knowledge Management”, TMH.
3. Amitesh Sinha, “ Data Warehousing”, Thomson Publication.
4. Claude Seidman, “Data Mining”, PHI.
5. W. H. Inmon, “Building a Data Warehouse”, John Wiley & Sons.
6. W. H. Inmon, C. L. Gassey, “Managing the Data Warehouse”, John Wiley & Sons.
7. Paul Raj Poonia, “Fundamentals of Data Warehousing”, John Wiley & Sons.

Laboratory Work

Case Studies: Mini Project on application of Data Warehousing and Data Mining in various areas like National Data Warehouses, Census Data, etc is to be undertaken. Well structured and good documentation is to be prepared.

Some areas of Data Warehousing and Data Mining with Case Studies, but not limited to:

- Data Warehousing in State Government.
- Data Warehousing for Ministry of Commerce.
- Data Warehousing in Hewlett-Packard.
- Data Warehousing in World Bank, etc.

PAPER XXV - - PROBABILITY & COMBINATION

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Unit 1 : Probability: Concept of probability, terminology and axioms, conditional probability, Bayes Theorem. Random Variables: Discrete and continuous. Distribution and density function, marginal and conditional distributions.

Unit 2 : Expectations: expectation and variance of random variable conditional expectation. Moment Generating Function (MGF), Cumulant Generating Function (CGF), Characteristic Function (CF).

Unit: 3 : Theoratical Distributions: Discrete distributions; Binomial distribution, Poisson distribution. Continuous distribution; Normal distribution, standard normal variate.

Unit 4 : Permutations and combinations: Factorial notations principles of counting, permutation with restrictions and without restrictions, Combinations: combinations of n different thing taking some or all of n things at a time, combination of n things taken some or all at a time when some them are alike, Relation between permutation and combination.

Unit 5 : Recurrence relations, Generating functions, Inclusion exclusion principle, Formula derangement.

References

- V. Ramaswamy " Discrete Methematical Structures with Applications to Combinations" Universities Press, 2006.
- Lie, C.L. "Introductions to Combinatorial Mathematics", McGraw Hill. 1996
- Ross, S., "A First Course in Probability" Prentice Hall, 7th Ed, 2005.

Laboratory Work for Sessional Marks

At least five tutorials each on probability, expectation, permutations and combinations, and recurrence relations.

List of IT Electives

Elective I

1. **Image Processing**
2. **Emerging Web Development Tools**
3. **ComputerGraphics and Animation**
4. **Advanced Unix Programming**

Elective II

1. **Advanced Network Programming**
2. **Parallel Programming**
3. **Web Engineering**
4. **Embedded systems**

Elective III

1. **Software Quality Domain**
2. **Information system Audit & Governance**
3. **E-Business Process Domain**
4. **Taxation Practices**

PAPER XIV - IT ELECTIVE I

1. IMAGE PROCESSING

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Image digital representation. Elements of visual perception. Sampling and quantisation. Image processing system elements.

Fourier transforms. Extension to 2-D,DCT, Walsh, Hadamard transforms.
Enhancement and segmentation : Gustigram modification Smoothing shaping. Threshoding. Edge detection. Segmentation. Point and region dependent techniques.

Image encoding. Fidelity criteria. Transform compression. KL, Fourier, DCT Spatial compression. Run lengthJcoding. Huffman and contour coding

Restoration : Models. Inverse filtering. Least squares filtering. Recursive filtering.

References

- Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing - Pearson Education 2003.
- William K Pratt, “Digital Image Processing”, John Willey 2001.
- A.K. Jain, “Fundamentals of Digital Image Processing”, PHI, New Delhi, 1995.
- Chanda Dutta Magundar, “Digital Image Processing and Applications”, Prentice Hall of India, 2000.

Laboratory Work for Sessional Marks

Lab Work should be based on

Application of various transforms on the image (minimum 5 experiments)

Application of filters on the image (minimum 5 experiments)

Study of image compression algorithms (minimum experiments)

Using suitable image processing software.

2. EMERGING WEB DEVELOPMENT TOOLS

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Unit I – Introduction to Web Technologies: Brief Introduction to WWW, Internet, History, Uniform Resource Locator (URL) Components of Web Technologies (Web Server, Mail Server, Web Browser, etc), Static and Dynamic Websites, Concept of 2, 3 Tier Architecture, Role of Middleware, Application of Web Technologies in E-Commerce, Web Space Registration, Management and Uploading (utilities like FTP), HTTP Protocol Basics, HTTP Request & Response, Cookies Basics, Client Browser Configuration. How scripting languages work – Server side scripting Language & Client Side Scripting. Introduction to Common HTML, DHTML, CSS.

Unit II – Introduction to Script, Types, Introduction to JavaScript, JavaScript Identifiers, Operators, Control & Looping Structure, Array, Array with Methods, Math, String, Data Objects with Methods. User Defined & Predefined Functions, DOM Objects, Window Navigator. Event Handling.

Unit III – VBScript: Introduction to VBScript, Variables, Data Types, Control Structures Loops, Functions, Client Side Web Scripting, Validating Forms, DOM, Handling Errors.

Unit IV – XML: Introduction and features of XML, XML Writing Elements, Attributes, etc. XML with CSS, DSO, XML Namespaces, XML DTD, XML Schemas, Writing Simple Sheets using XSLT, SAX & DOM Parsers, Introduction to SOAP.

Unit V – JSP and AJAX: JSP Architecture, Life Cycle of JSP, Advantages of JSP, Developing Web Pages using JSP, Form Processing in JSP, Introduction to AJAX, Working of AJAX, Application using AJAX.

Unit VI – PHP: PHP and Web Server Architecture Model, Overview of PHP Capabilities, PHP HTML Embedding Tags & Syntax, Simple Script Examples. Variables, Constants, Data Types, Operators, Loops, Arrays, String, Functions, Simple File and Directory Access Operations, Error Handling, Sending E-Mail. Database Operations with PHP built-in

functions, Connecting to MS-ACCESS database, Selecting a Database, Building and sending Query, Retrieving, Updating and Inserting Data.

Books:-

1. Achut Godbole, "Web Technologies", TMH.
2. Eric Meyer, "CSS-Definitive Guide", Oreilly Publication.
3. Java Script Bible.
4. VBScript Programmers Reference, Wrox Press.
5. Hofstetter Fred, "Internet Technology at Work".
6. Beginning XML, Wrox Press.
7. Dietel & Dietel, "XML How to Program".
8. Robert W. Sebesta, " Programming the World Wide Web".
9. Beginning PHP5.
10. Complete Reference PHP.
11. Beginning PHP, Apache, MySQL Web Development.

Laboratory Work

A mini web project is to be developed using the different web technologies from the syllabus.

3. COMPUTER GRAPHICS AND ANIMATION

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Graphic display devices (monochrome and colour), Interactive device. Line and Circle plotting using Bresenhem's algorithm, DDA line drawing algorithm.

Filling algorithm: Edge fill, Seed fill algorithm. Curve drawing using Hermite polynomial, Bezier Curves, B-Splines.

Transformation: Translation, Rotation, Scaling, Mirror Images, Coordinate system, 3D-Transformation, Rotation about an arbitrary axis, Orthogonal Projections, Multiple Views, Isometric Projection, Perspective Projections (one ,two and three vanishing points), Wire Frame Prespective Depth.

Window and Clipping: The Viewing Transformation, Windowing Transformation, Sutherland Cohen, Mid Point Subdivision, Cyrus Beck Algorithms.

Segmented Display Files: Display File Compilation, Segment Table, Geometric Model and Picture Structure. Hidden Line and Surface Removal, Introduction to Shading. Curved Surface Generation, Generation of Solids, Sweep method, Interpolation.

Graphics Standards: GKS/PHIGS/X WINDOW.

Animation Basics: keyframing, tweening, kinematics, motion specification, morphing, animation file formats, 3D image and animation basics-rendering and virtual walkthroughs

References

1. W.K. Gilloi, Interactive Computer Graphics, PHI.
2. D.F. Rogers, Procedural Elements for Computer Graphics, McGraw-Hill.
3. J.D. Foley and A.D. Van, Fundamentals of Interactive Computer Graphics, Addison-Wesley.
4. Rogers and Adam, Mathematical Elements for Computer Graphics, McGraw-Hill.
5. D. Hearn and M. P. Baker, Computer Graphics, PHI, 1996.
6. Tay Vaughan, Multimedia-Making it work, TMH

7. Ze-Nian Li and Mark S. Drew, Fundamentals of Multimedia,TMH
8. R. Steinmetz and K. Nahrstedt, Multimedia: Computing, Communications and Applications, Prentice Hall, PTR, 1995.

Laboratory Work for Sessional Marks

At least 6 practical sessions for implementing graphics algorithm

A minimum 2 minuts animation in Flash for education/advertisement/presentation etc.

4. ADVANCED UNIX PROGRAMMING

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Organisation of Unix. User interface. Programmer interface. The environment of Unix process System calls. Process control File related system calls. Process related system calls. Signal Programming using system calls.

Advanced I/O multiplexing. Memory mapped. I/O.

Interprocess communication: Pipes, shared memory, semaphores, messages.

Advanced interproceses communications. Streams. Pipes. Open server.

References

1. Mohammed Azam, "UNIX in Easy Steps", New Age International Publications", 2008.
2. Das S., "Your UNIX-The Ultimate Guide", TMH, 2006.
3. Stevens W.R., "Advanced Programming in the UNIX Environment", Pearson Education, 2002.

Laboratory Work for Sessional Marks

At least 10 practical tutorials on Shell Programming.

Paper XIX I. T. Elective II.

1. ADVANCED NETWORK PROGRAMMING

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Communication Protocol, Internet Protocols Novell, network system. System network architecture, UUCP, IPX/SPX for LANs. Protocols comparison.

Berkeley sockets: Overview Unix domain protocols. Socket addresses socket system calls Reserved ports. Passing file descriptors. I/O asynchronous and Multiplexing socket implementation..

Winsock Programming : Using the windows socket. API Window sockets and blocking I/O.

Other windows extensions. Network dependent UNRI () DLL. Sending and receiving data over connections termination.

Novel IPX/SPX: Novel's Windows drivers. NetWare interface for windows. IPX/SPX procedure. Datagram communication. Connection oriented communication with SPX,JPX/SPX implementation of DLL.

Programming applications: Time and data routines. Ping trivial file transfer protocol. Remote Login.

Books:-

1. Larry L. Peterson & Bruce S. Davie, "Computer Networks - A systems Approach", 2nd Edition, Harcourt Asia/Morgan Kaufmann, 2000.
2. James F. Kurose and Keith W. Ross, "Computer Networking - A Top Down Approach featuring the Internet", 1st Edition, Addison Wesley Publishing Company, 2001.
3. Davis R. "Windows Network Programming" Addison Wesley, Reading, M.A.

Stevan R., “Unix Network Programming”, Prentice Hall of India, New Delhi.

Laboratory Work for Sessional Marks

A mini project for establishing communication between two or more computers for some suitable communication like mailing, file sharing, discussion forum, remote login etc.

2. PARALLEL PROGRAMMING

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Processes and processors. Shared memory. Fork, Join constructs. Basic parallel programming techniques-loop splitting, spin lock, contention barriers and row conditions

Variations in splitting, self and indirect scheduling. Data dependency-forward and backward, block scheduling.

Liner recurrence relations. Backward dependency. Performance tuning overhead with number of processes, effective use of cache.

Parallel programming examples : Average, mean squared deviation, curve fitting, numerical integration, travelling salesman problem , Gaussian elimination. Discrete event time simulation.

Parallel programming constructs in HPF Fortran 95 . Parallel programming under Unix

Books:-

1. Hawang, K, Brigg, "Computer Architetecure and Parallel Processing", McGraw Hill, 2005.
2. Michael J. Quinn "Parallel Computmg -Theory and practice", McGraw-Hill International Edition, end Edition, 2004.
3. Selim G, AKL, "Design and Analysis of Parallel Algroithms", Printice Hall.
4. Hwang K, "Advance Computing Architecture -Parallelism, Scalability and Programming", McGraw Hill International Edition, 1993.

Laboratory Work for Sessional Marks

At least ten (10) practical assignments on the topics mentioned in theory using suitable parallel programming architecture.

3. WEB ENGINEERING

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Introduction, need to redefine web engineering, web engineering vs. conventional engineering, philospical view of webApps, Importance of web process agility,

Web Engineering Process: Defining the Framework, Incremental Process Flow Framework Activities , Generic Actions and Tasks for the WebE Framework, Communication Activity, Tasks Required to Develop an Increment Plan, Modeling: Analysis Modeling Tasks ,Elements of a Design Model, Design Modeling Tasks, Construction Tasks ,Deploying a WebApp Increment, Umbrella Activities, WebE Team Management, Risk Management and Work Management.

Communication and Planning: The Communication Activity Formulation Who Should We Communicate With, Techniques for Communication, Elicitation, Tasks Performed During an Elicitation Session, User Categories for the WebApp, Content and Functional Requirements Identification, Performance Issues , **Planning**: Understanding Scope, Relevant Communication Work Products , Refining Framework Activities: Actions and Tasks, Work Products Change Management, How to Build a Successful WebE Team, Characteristics of a Good Team Leader, Managing Risk, Developing Contingency Plans, Schedule, Macroscopic Scheduling, Increment Scheduling, Time and effort estimation, Task interdependencies **The**

The Modeling Activity: Modeling as a Concept, Usefulness of a Model, Modeling Frameworks , Modeling Languages, **Model Based Web Application Development** The OOHDM Approach,Model Functionality capabilities ,Model Information Content capabilities,, Existing Modeling Approaches ,**Analysis Modeling** :Understanding Analysis in the Context of WebE, Analysis Modeling for WebApps

WebApp Design: Logical Design, Physical Design, The Design Process, Elements of WebApp Design, Characteristics of the Design Process, Initial Design of the Conceptual Architecture, Initial Design of the Technical Architecture **Interaction Design**:

Interface Design Principles and Guidelines, Interface Design Workflow, Interface Design Preliminaries, Interface Design Steps, Aesthetic Design Information Design: Architecture, Elements, characteristics of a good Information Architecture Functional Design: Functional Architecture, Detailed Functional Design

Web Quality: Introduction**,** Different Perspectives of Quality, Evaluating Web Quality Using WebQEM **,** External Quality Requirements.

Web Application Testing: Testing challenges, unit Integration and system testing of A Web Application, Testing Strategies, Tools.

Construction and Deployment: Construction and Deployment within the WebE Process Construction Principles and Concepts, Deployment- Deployment Principles , CMS, Generic Components, OO Components, Conventional Components, Characteristics of a "Good" Component ,Component Design Steps.

Outsourcing WebE Work: Initiating an Outsourced Project, Selecting Candidate Outsourcing Vendors, Assessment of Validity of Price Quotes and the Reliability of Estimates, Level of Project Management, Assessing the Schedule and Manage Scope

Books:-

1. Roger S. Pressman, David Lowe "Web Engineering: A Practitioner's Approach" McGraw-Hill, 2009
2. Emilia Mendes, Nile Mosley, "Web Engineering" Springer (Jan 2006)

Laboratory Work

A mini web project model is to be developed using the different techniques from the syllabus (may not actually be implemented).

4. EMBEDDED SYSTEMS

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Embedded Computing: Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples.

The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/output, Interrupts.

Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.

Applications: Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication.

Introduction to Real – Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment

Basic Design Using a Real-Time Operating System: Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System.

Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller.

References

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.
6. Computers and Components, Wayne Wolf, Elseveir.
7. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.
8. An Embedded Software Primer, David E. Simon, Pearson Education.

Laboratory Work

A mini project is to be developed for any one real time application of Embedded System

Paper XXI: IT Elective III

(Note: Sessional Marks for IT Elective III should be based on a detailed **Case Study** on the selected subject.**)**

1. SOFTWARE QUALITY DOMAIN

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Software Quality Assurance

1 Quality Concept

- 1.1Definition of Quality, QA, SQA
- 1.2 Quality factors
- 1.3 Software Quality Metrics
- 1.4 Process Improvement
- 1.4.1 Process and Product Quality
- 1.4.2 The SEI Process Capability Maturity model, ISO, Six-Sigma
- 1.4.3 Process Classification

2 Software Quality Assurance

- 2.1 Need for SQA
- 2.2 SQA Activities
- 2.3 Building blocks of SQA
- 2.4 SQA Planning & Standards

3 Software Reliability

- 3.1 Reliability Measures
- 3.2 Reliability models

4 Verification & Validation

- 4.1 Verification & Validation Planning
- 4.2 Software inspections
- 4.3 Automated static Analysis

4.4 Clean room Software Development

Software Testing

5 Software Testing Fundamentals

5.1 Testing objectives

5.2.How test information flows

5.3 Testing lifecycle

5.4 Test Cases – What it is?, Test Case Designing(Concept & introduction should be covered here. Detailed techniques should be covered in Unit No. 2.4)

6 Levels of Testing

6.1 Unit Testing

6.2 Integration Testing

6.3 System Testing

6.4 Acceptance Testing

6.4.1 Alpha testing & Beta testing

6.5 Static vs. Dynamic testing

6.6 Manual vs. Automatic testing

6.7 Testers workbench

6.7 11-steps of testing process (Only steps should be covered)

7 Different types of Testing

7.1 Installation Testing

7.2 Usability testing

7.3 Regression testing

7.4 Performance Testing

7.4.1 Load Testing

7.4.2 stress testing

7.5 Security testing

8 Static & Dynamic Testing

8.1 Static Testing Techniques

8.2 Review types: Informal Review, Technical or peer review, Walkthrough, Inspection, static analysis

8.3 Review Meeting,

8.4 Review Reporting & Record keeping, Review guidelines & Review checklist

8.5 Data flow analysis

8.6 Control flow analysis

8.7 Cyclometric Analysis

8.8 Dynamic testing – need & Advantages

9 Black Box & White Box Testing (Test Case Design Techniques)

9.1 Functional Testing (Black Box) Equivalence partitioning, BVA, Cause- Effect graphing, Syntax testing (Concept & Test case generation only)

9.2 Structural Testing (White Box) Coverage testing, Statement coverage, Branch & decision coverage, Path coverage

9.3 Domain Testing

9.4 Non functional testing techniques

9.5 Validation testing Activities Low level testing, High level testing

9.6 Black box vs. White Box

10 Testing specialized Systems and Applications

10.1 Testing object oriented software

10.2 Testing Web based Applications

10.3 Computer Aided Software testing tools (CAST) (only type & their purpose should be covered)

Books:-

1. Software Engineering R. Pressmen – 6th Ed

2. Software Engineering Sommerville

3. Introducing Software Testing Louise Tamres

4. Effective Methods for software Testing William Perry

5. Software Testing in Real World Edward Kit

6. Software Testing Techniques Boris Beizer

7. Software quality assurance: Principles and Practices by Nina Godbole, Narosa Publishing

2. INFORMATION SYSTEM AUDIT & GOVERNANCE

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

1 Auditing concepts ISA need, concept, standards, performance, steps , techniques methodologies , around and throughcomputer.

2 Controls – Concept objectives, types,risk, exposure

3 IT environment – hardware, system software, OS, DBMS, Infrastructure,network concepts, Personnel, documentation, review of performance, procurement, and other controls Network concepts, LAN, WAN, Client-Server architecture, Internet, EDI, email, encryption, digital signatures –review of performance, procurement and other controls.

4 Software procurement and development –SDLC – Meaning and IS auditor's roletraditional SSAD , OOM , prototyping , 4GL , project management , testing , implementation review.

5 Is-operations -planning, organizing, scheduling, SCM, problem management , record management, QA and QC , review and controls

6 Controls – Input , process , validation , output, logical access, physical access , database , network , environment , BCP

7 Evidence collection, evaluation and reporting methodologies

8 IS strategies and management – organization structure , long term and short term plans , steering and other committees , HR policies , segregation of duties

9 IT crimes , viruses , security , privacy issues

10 Broad introduction to concepts and practice of e-commerce and legal framework for e-commerce

11 Case studies and assignments

Books:-

1. Names of ISA related material is given. For all other IT related topics, e.g. EIT , SSAD , DBMS , Network etc various standard books are available in the market and also recommended by the University.
2. "EDP Auditing Conceptual Foundations And Practices" by Ron Weber – McGraw-Hill publication
3. Latest CISA review manual by ISACA , USA – This may be procured by

individual institutes and made available to students on library basis

4. IS audit standards and control objectives of ISAXA which are non-copyrighted and relevant , refer www.isaca.org

5. IS control journals from ISACA

Sessional Marks:

Two case studies and two assignments need also be covered.

Session-wise suggested contents are enclosed Many topics will have to be covered at a broad level only.

Role of IS auditor and relation of each topic to ISA controls and review should be part of all lectures. Emphasis should be on Audit , security, control, review and documentation aspects and usage of relevant standards as relevant to all the IT facets.

3. E-BUSINESS PROCESS DOMAIN

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Introduction to e-commerce: Business models, revenue models and business processes, economic forces & e-commerce, identifying e-commerce opportunities, international nature of e-commerce, technology infrastructure-internet & WWW; Business strategies for e-commerce: Revenue models in transaction, revenue strategic issues, creating an effective web presence, website usability; Marketing on the web: Web marketing strategies, communicating with different market segments, customer behavior and relationship intensity, advertising on the web, e-mail marketing, technology enabled CRM, search engine positioning and domain names.

Business to business strategies: (Overview strategic methods for Developing E-Commerce) Purchasing, logistics and supply activities, electronic data interchange (EDI), electronic data interchange on the internet, supply chain management using internet technologies, electronic market place & portals (Home shopping, E-marketing, Tele marketing), auctions, online auctions, virtual communicative & web portals; legal, ethical & tax issues in e-commerce — use and protection of intellectual property in online business, online crime, terrorism & warfare, ethical issues.

Four C's (Convergence, Collaborative computing, Content management & Call centre)

Technologies for e-commerce: web server hardware & software, e-commerce software, e-commerce security — online security issues, security for client computers, communication channel security, security for server computers, organizations that promote computer security; Payment statements in e-commerce(Payment through card system, E-cheque, E-cash, E-payment threats and protection), planning for e-commerce— planning e-commerce initiatives, strategies for delivering e-commerce web sites, managing e-commerce Implementations.

Enterprise resource planning: Business functions, processes & data requirements, development of ERP systems, marketing information systems & sales order process, production & supply chain management information systems, accounting in ERP systems, human resource processes with ERP, process modeling, process improvement and ERP implementations, Relationship between e-commerce and ERP.

Text Books

1. Dave **Chaffey**, "*E-Business and E-Commerce Management*", Third Edition, 2009, Pearson Education Inc., New Delhi.
2. Ellen **Monk**, Bret **Wagner**, **"***Concepts in Enterprise Resource Planning***",** *Second* Edition, CENGAGE Learning India Pvt. Ltd., New Delhi.

Reference Books:

1. Gary P. **Schneider**, "*Electronic Commerce*", Seventh Edition, CENGAGE Learning India Pvt. Ltd., New Delhi.
2. K.K.Bajaj, D. Nag "*E-Commerce*", 2nd Edition, McGraw Hill Education, New Delhi
3. P.T. Joseph, "*E-Commerce An Indian Perspective*", PHI Publication, NewDelhi.
4. Bhaskar Bharat, *"Electronic Commerce-Technology and Application"*, McGraw Hill Education, New Delhi
5. Mary **Sumner**, "*Enterprise Resource Planning*", 2005, PHI Learning India Pvt. Ltd. / Pearson Education, Inc. New Delhi.
6. Chan, " *E-Commerce fundamentals and Applications*", Wiley India, New Delhi

Sessional Marks

At least ten (10) tutorials covering the theory.

5. TAXATION PRACTICES

Theory	**60**
Sessional / Practical	**40**
Credit	**5**

Assessment of undivided families : Meaning Basic conditions. Taxable income. Partitions Tax planning. Assessment of firms and associations: Scheme of taxation type treatment of losses. Tax planning.

Assessment of companies : Types profits depreciation tax planning Section 80 Bonus issues dividend policy. Return of income and assessment procedure : Types of assessment Time limits Reassessment. Cooperatives.

Collection and recovery of tax: Deduction at source, rates advance payment. Modes of recovery. Refund appeals and revision penalties.

Wealth Tax. Chargebility, valuation return appeals revisions payment and recovery, gift tax Chargebility, rebate assessment approval revisions, payment and recovery.

Central Sales tax: Concept of sale and purchase Inter-state trade. Interstate export and import trade. State sale tax Assessing authority single, multiple point tax. Procedure for registration and cancellation. Returns, payment, appeals and revisions .

References

1. Lal, “Income Tax and Central Sales Tax: Law and Practice”, Pearson Education, Delhi. 2008.
2. Lal, “Direct Taxes”, Pearson Education, Delhi, 2008.
3. Satyaprasad, Harish & Others, “Income Tax-1”, Himalaya Publishing House, Delhi, 2007.
4. Aswathappa & Others, “Business Law”, Himalaya Publishing House, Delhi, 2008.