

MATS School of Engineering & Technology

MATS University

Raipur



Syllabus Scheme

(8th Semester)

For

Bachelor of Engineering

In

Computer Science & Engineering

Subject Code For School of Engineering & Tech. Deptt.

8th Semester (Computer Science)

S.No.	Subject Code	Subject Name
1	BE820	Artificial Intelligence & Expert System
2	BE821	Parallel Processor & Computing
3	BE822	Data Mining & Ware housing
4	Refer Table3	Professional Elective-3
5	Refer Table 4	Open Elective-4
6	BE825	Artificial Intelligence & Expert Systems Lab
7	BE827	Software Technology Lab-2
8	BE828	Major Project

Table – 3
Professional Elective –III

S.N.	Subject Code	Subject Name
1	BE8230	Neural Network and Fuzzy Logic
2	BE8231	Distributed Operating System
3	BE8232	Wireless Networks
4	BE8233	Real Time Systems
5	BE8234	Cyber Crime & Laws

Table – 4
Open Elective-4

S.N.	Subject Code	Subject Name
1	BE8240	Enterprise Resource Planning
2	BE8241	Bioinformatics
3	BE8242	E-Commerce & strategic IT
4	BE8243	Software Project Management
5	BE8244	Nanotechnology



MATS School of Engineering & Technology
MATS University, Raipur
Scheme of Teaching & Examination
VIIIth Semester
Computer Science & Engineering



S. No.	Course Code	SUBJECT	Periods per week		Evaluation Scheme		Total Marks
			L	P	Internal	External	
THEORY							
1	BE820	Artificial Intelligence & Expert System	5	0	30	70	100
2	BE821	Parallel Processor & Computing	5	0	30	70	100
3	BE822	Data Mining & Ware housing	5	0	30	70	100
4	Refer Table-3	Professional Elective-3	5	0	30	70	100
5	Refer Table- 4	Open Elective-4	5	0	30	70	100
PRACTICAL/DESIGN/DRAWING							
6	BE825	Artificial Intelligence & Expert Systems Lab	0	3	20	30	50
7	BE827	Software Technology Lab-2	0	3	20	30	50
8	BE828	Major Project	0	3	100	100	200

Table- 3		
Professional Elective-3		
S. No.	Course Code	SUBJECT
1	BE8230	Neural Network and Fuzzy Logic
2	BE8231	Distributed Operating System
3	BE8232	Wireless Networks
4	BE8233	Real Time Systems
5	BE8234	Cyber Crime & Laws

Table- 4		
Open Elective-4		
S. No.	Course Code	SUBJECT
1	BE8240	Enterprise Resource Planning
2	BE8241	Bioinformatics
3	BE8242	E-Commerce & strategic IT
4	BE8243	Software Project Management
5	BE8244	Nanotechnology

L-Lecturer, P-Practical, ESE- End Semester Examination, IM-Internal Marks

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM

BE820

UNIT I

OVERVIEW & SEARCH TECHNIQUES

Introduction to AI, Problem Solving, State space search, Blind search: Depth first search, Breadth first search, Informed search: Heuristic function, Hill climbing search, Best first search, A* & AO* Search, Constraint satisfaction. Game tree, Evaluation function, Mini-Max search, Alpha-beta pruning, Games of chance.

UNIT II

KNOWLEDGE REPRESENTATION (KR)

Introduction to KR, Knowledge agent, Predicate logic, WFF, Inference rule & theorem proving: forward chaining, backward chaining, resolution; Propositional knowledge, Boolean circuit agents. Rule Based Systems, Forward reasoning: Conflict resolution, backward reasoning, Use of backtracking. Structured KR: Semantic Net-slots, Inheritance, Frames-exceptions and default attached predicates, Conceptual Dependency formalism, Other knowledge representations.

UNIT III

HANDLING UNCERTAINTY & LEARNING

Source of uncertainty, Probabilistic inference, Bayes' theorem, Limitation of naïve Bayesian system, Bayesian Belief Network (BBN), Inference with BBN, Dempster-Shafer Theory, Fuzzy Logic, Fuzzy function, Fuzzy measure, Non monotonic reasoning: Dependency directed backtracking, Truth maintenance systems. Learning: Concept of learning, Learning model, learning decision tree, Paradigms of machine learning, Supervised & Unsupervised learning, Example of learning, Learning by induction, Learning using Neural Networks.

UNIT IV

NATURAL LANGUAGE PROCESSING (NLP) & PLANNING

Overview of NLP tasks, Parsing, Machine translation, Components of Planning System, Planning agent, State-Goal & Action Representation, Forward planning, Backward chaining, Planning example: partial-order planner, Block world.

UNIT V

EXPERT SYSTEM & AI LANGUAGES

Need & Justification for expert systems, Cognitive problems, Expert System Architectures, Rule based systems, Non production system, Knowledge acquisition, Case studies of expert system. AI language: Prolog syntax, Programming with prolog, Back tracking in prolog, Lisp syntax, Lisp programming.

Text Books:

1. Elaine Rich and Kevin Knight: Artificial Intelligence- Tata McGraw Hill.
2. Dan W.Patterson Introduction to Artificial Intelligence and Expert Systems- Prentice Hall of India.

Reference Books:

1. Nils J.Nilsson: Principles of Artificial Intelligence- Narosa Publishing house.
2. Clocksin& C.S. Melish; Programming in PROLOG- Narosa Publishing house.
3. M. Sasikumar, S.Ramani, et. al.: Rule based Expert Systems (A practical Introduction) NarosaPublishing House.

PARALLEL PROCESSOR & COMPUTING

BE821

UNIT I

INTRODUCTION & TECHNIQUE OF PARALLELISM

Trends towards parallel computing, Parallelism in Uni-processor systems, Architectural classification schemes, Amdahl's law, Moore's law, Principles of Scalable Performance, Parallel Processing in Memory, Parallel Algorithms, Parallel Algorithm Complexity, Models of Parallel Processing, Cache coherence, Cache coherence Protocols.

UNIT II

PIPELINE & VECTOR PROCESSING

Conditions of Parallelism: Data & Resource dependencies, Program flow mechanisms: Control-flow vs Data flow computers, Principle of pipelining and vector processing: Principles of linear pipelining, Classification of pipeline processors, General pipelines and reservation tables, Instruction and arithmetic pipelines, Vector processing, Architecture of Cray-1, Pipeline hazards, VLIW computers, Array Processing.

UNIT III

PARALLEL MODELS & MESH-BASED ARCHITECTURES

PRAM and Basic algorithms-PVM, Parallel algorithms, Parallel algorithm, Different sorting algorithms, Parallel algorithm complexity, Routing in different topologies, Wormhole routing, Static and dynamic interconnection networks.

UNIT IV

MULTIPROCESSOR ARCHITECTURE AND PROGRAMMING

Emulation and Scheduling, Emulations among Architectures, Distributed Shared Memory, Data Storage, Input, and Output, Multithreading and Latency Hiding, Parallel I/O Technology, Defect-Level Methods, Fault-Level Methods, Error-Level Methods, Parallel Programming Parallel Operating Systems, Parallel File Systems, Data & Control Dependence, Dependence Analysis.

UNIT V

PARALLEL SYSTEM IMPLEMENTATIONS

Shared-Memory MIMD Machines, Variations in Shared Memory, MIN-Based BBN Butterfly, Vector Parallel Cray Y-MP, CC-NUMA Stanford DASH, Message-Passing MIMD Machines, Data-Parallel SIMD Machines, Processor and Memory Technologies.

Text Books:

1. Computer Architecture & Parallel processing - Kai Hwang & Briggs.(MGH).
2. Parallel Computers: Arch.& Prog., Rajaraman& Siva Ram Murthy, PHI.

Reference Books:

1. R.W. Hockney, C.R. Jesshope, "Parallel Computer 2 –Arch.&Algo.", Adam Hilger.
2. K. Hwang, "Advanced Computer Architecture with ParallelProgramming", MGH.
3. Parallel computing- Theory and practice - Michael J Quinn- McGraw Hill

DATA MINING AND WARE HOUSING

BE822

UNIT I

Overview And Concepts: Need for data warehousing, Basic elements of data warehousing, Trends in data ware housing. Planning and Requirements: Project planning and management, Collecting the requirements. Architecture And Infrastructure: Architectural components, Infrastructure and metadata.

UNIT II

Data Design And Data Representation: Principles of dimensional modeling, Dimensional modeling advanced topics, Data extraction, Transformation and loading, Data quality.

UNIT III

Information Access and Delivery: Matching information to classes of users, OLAP in data warehouse, Data warehousing and the web, Implementation and Maintenance: Physical design process, Data warehouse deployment, Growth and maintenance.

Data Mining

UNIT IV

Introduction: Basics of data mining, Related concepts, Data mining techniques. Data Mining Algorithms: Classification, Clustering, Association rules.

Knowledge Discovery: KDD Process.

UNIT V

Web Mining: Web Content Mining, Web Structure Mining, Web Usage mining. Advanced Topics: Spatial mining, Temporal Mining, Visualization, Data Generalization and Summarization based characterization. Analytical characterization: Analysis of attribute relevance. Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases Data Mining Primitives, Languages, and System Architectures, Data mining primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems Application and Trends in Data Mining: Applications, Systems products and research prototypes, Additional themes in data mining, Trends in data mining.

Text Books:

1. Prabhu, Data ware housing- concepts, Techniques, Products and Applications, Prentice hall of India
2. Soman K P, "Insight into Data Mining: Theory &Pratice" , Prentice hall of India
3. M.H. Dunham, "Data Mining Introductory and Advanced Topics", Pearson Education.

Reference Books:

1. Paulraj Ponniah, "Data Warehousing Fundamentals", John Wiley.
2. Gupta, "Introduction To Datamining with Case Studies", PHI
3. Ralph Kimball, "The Data Warehouse Lifecycle toolkit", John Wiley.
4. IBM, "Introduction to Building The Datawarehouse" PHI

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM LAB

BE825

Experiments to be performed:

1. Write a prolog program to find the rules for parent, child, male, female, son, daughter, brother, sister, uncle, aunt, ancestor given the facts about father and wife only.
2. Write a program to find the length of a given list
3. Write a program to find the last element of a given list
4. Write a program to delete the first occurrence and also all occurrences of a particular element in a given list.
5. Write a program to find union and intersection of two given sets represented as lists.
6. Write a program to read a list at a time and write a list at a time using the well-defined read & write functions.
7. Write a program given the knowledge base,
If x is on the top of y, y supports x. If x is above y and they are touching each other, x is on top of y.
A cup is above a book. The cup is touching that book. Convert the following into wffs, clausal form; Is it possible to deduce that 'The book supports the cup'.
8. Write a program given the knowledge base,
If Town x is connected to Town y by highway z and bikes are allowed on z, you can get to y from x by bike.
If Town x is connected to y by z then y is also connected to x by z. If you can get to town q from p and also to town r from town q, you can get to town r from town p.
Town A is connected to Town B by Road 1. Town B is connected to Town C by Road 2.
Town A is connected to Town C by Road 3. Town D is connected to Town E by Road 4.
Town D is connected to Town B by Road 5. Bikes are allowed on roads 3, 4, 5.
Bikes are only either allowed on Road 1 or on Road 2 every day. Convert the following in towff's, clausal form and deduce that 'One can get to town B from town D'.
9. Solve the classical Water Jug problem of AI.
10. Solve the classical Monkey Banana problem of AI.
11. Solve the classical Crypt arithmetic problems such as DONALD + GERALD = ROBERT of AI.
12. Solve the classical Missionary Cannibals problem of AI.
13. Solve the classical Travelling Salesman Problem of AI.
14. Solve the classical Blocks World Problem of AI.
15. Write a program to search any goal given an input graph using AO* algorithm.

List of Equipments/Machine required :

1. PC with Windows XP
2. Visual prolog compiler

Recommended Books:

1. Ivan Bratko : Logic & prolog programming.
2. Carl Townsend : Introduction to Turbo Prolog, (BPB, Publication).
3. W.F. Clocksin & Mellish : Programming in PRLOG (Narosa Publication House)

NETWORK SECURITY LAB

BE826

List of Experiments to be performed:

1. Networking Security Programming with TCP/IP for Application layer, Transport layer, Network layer, Data link layer protocols.
2. Socket Security Programming for address structures, byte manipulation & address conversion functions, elementary socket system calls.
3. APIs security Programming for windows socket API, window socket & blocking I/O model, blocking sockets, blocking functions, timeouts for blocking I/O.
4. Web Security Programming for firewall and others.
5. Web databases security programming.
6. Component Security Programming for CORBA.
7. CGI Security programming and Firewall
8. Programming for Cryptography and Digital Signature.
9. Java network Security programming.
10. Client Server Security Programming.

Recommended Books:

1. Steven.W.R: UNIX Network Programming, PHI (VOL I& II)
2. Window Socket Programming by [Bobb](#) Quinn and Dave Schutes
3. Davis.R.: Windows Network Programming, Addison Wesley
4. NETWORK PROGRAMMING With Windows Socket By Baner .P., PH NewJersey

SOFTWARE TECHNOLOGY LAB- 2

BE827

List of Experiments to be performed:

1. Introduction to PHP: History, syntax, comments, Variable , data type ,operators, exception.
2. Write a program in PHP to print the current date.
3. Write a program in PHP to explain how data are stored in variables.
4. Write a program in PHP to print a pattern using loop.
5. Write a program to insert values in 1-D array and print it in increasing and decreasing order.
6. Write a program to explain if...else and switch statement.
7. Write a program to explain GET and POST method.
8. Design a form containing buttons, drop down list, check box and various other tools.
9. Design a form displaying student mark sheet.
10. Design a railway reservation form.
11. Write a program which has a data base connectivity and contain all following Button FIND, ADD, DELETE, MODIFY,CANCEL. Give proper code to perform the activity described by the buttons.
12. Write a program to explain file handling : open, read , write , append , truncate , delete

Text/Reference Books:

1. Learning PHP 5, David sklar , o'reilly
2. Core PHP Programming , Leon Atkinson, Prentice Hall

MAJOR PROJECT

BE828

Guidelines

Allocation of project:

1. Information regarding broad area must be made available to the students well in advance (may be during previous semester).
2. Information must cover following parameters.
 - I. **Broad area:** Subject or expertise/application area.
 - II. **Required skills:** Knowledge of subject(s), software, tools & other characteristics.
 - III. **Type of project:** Hardware, software, design, survey, study based etc.
 - IV. **Guide available:** Name of Guide (S) from Department & Institute.
 - V. **Other related information** depending upon specific branch & institute.
3. It is also recommended to give proper counseling to pick up suitable project.
4. Students must get chance to select projects as per their choice or decided mutually between students and department faculty (HOD) concern.
5. One project group must contain maximum four students, however students can do project individually but it should be approved by department.
6. Compiled list of projects must be submitted to the University within 25 days of start of semester.
7. Compiled list may contain following parameters.

Sr. No.	Title of Project	Name of Students	Name of Guide

Name of HOD

Signature of HOD

Signature of Principal

Monitoring of project:

1. It is recommended to give projects as per the specializations of existing faculty of the department instead of outside person/agency.
2. Project must be allocated, developed and monitored by department / institution itself, but not by outside agencies.
3. Regular review by guide is recommended to ensure development & contribution of students.

Internal Evaluation & Submission of project:

1. Evaluation of project would be as per the examination scheme of the University, which is based on internal as well as external evaluation.
2. Internal assessment requires submission of project report for getting approved by the concern authority. However printing and binding would be as per the conventional format.
3. Evaluation will be based on Live demonstration / presentation and Viva.
4. Final submission of project is expected as,
 - Submission of a copy to the University,
 - One copy to the Institution central library,
 - One copy to the department.

External Evaluation:

External assessment of project would be like conduction of practical exams of University, and must be executed as per the norms of practical exams.

NOTE: Completion of Project outside the department/Institution should not be

NEURAL NETWORK AND FUZZY LOGIC

BE8230

UNIT I

INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS

Elementary Neurophysiology, Models of a Neuron, Neural Networks viewed as directed graphs, Feedback, from neurons to ANN, Artificial Intelligence and Neural Networks; Network Architectures, Single-layered Feed forward Networks, Multi-layered Feed forward Networks, Recurrent Networks, Topologies.

UNIT II

LEARNING AND TRAINING

Activation and Synaptic Dynamics, Hebbian, Memory based, Competitive, Error-Correction Learning, Credit Assignment Problem: Supervised and Unsupervised learning, Memory models, Stability and Convergence, Recall and Adaptation.

UNIT III

A SURVEY OF NEURAL NETWORK MODELS

Single layered Perception: Least mean square algorithm, Multi-layered Perception, Backpropagation Algorithm, XOR related Problem, Generalized Delta rule, BPN Applications, Adalines and Madalines, Algorithm and applications.

UNIT IV

APPLICATIONS

Talking Network and Phonetic typewriter: Speech Generation and Speech recognition, Neocognitron, Character Recognition and Handwritten Digit recognition, Pattern Recognition Applications.

UNIT V

NEURAL FUZZY SYSTEMS

Introduction to Fuzzy sets, Operations, relations, Examples of Fuzzy logic, Defuzzification, Fuzzy Associative memories, Fuzziness in neural networks and examples.

Text Books:

1. Artificial Neural Networks by B. Yagna Narayan, PHI
2. Neural Networks Fuzzy Logic & Genetic Algorithms by Rajshekaran & Pai, Prentice Hall

Reference Books:

1. Neural Networks by James A. Freeman and David M. Skapura, Prentice Hall,.
2. Neural Network & Fuzzy System by Bart Kosko, PHI.
3. Neural Network Design by Hagan Demuth Deale Vikas Publication House

DISTRIBUTED OPERATING SYSTEM

BE8231

UNIT I

INTRODUCTION:

Introduction to Distributed System, Goals of Distributed system, Hardware and Software concepts, Design issues. Communication in distributed system: Layered protocols, ATM networks, Client–Server model, Remote Procedure Calls and Group Communication, Middleware and Distributed Operating Systems.

UNIT II

SYNCHRONIZATION IN DISTRIBUTED SYSTEM

Clock synchronization, Mutual Exclusion, Election algorithm, the Bully algorithm, Ring algorithm, Atomic Transactions, Deadlock in Distributed Systems, Distributed Deadlock Prevention, Distributed Deadlock Detection.

UNIT III

PROCESSES AND PROCESSORS IN DISTRIBUTED SYSTEMS

Threads, System models, Processors Allocation, Scheduling in Distributed System, Real Time Distributed Systems.

UNIT IV

DISTRIBUTED FILE SYSTEMS

Distributed file system Design, Distributed file system Implementation, Trends in Distributed file systems.

DISTRIBUTED SHARED MEMORY

What is shared memory, Consistency models, Page based distributed shared memory, shared variables distributed shared memory.

UNIT V

CASE STUDY MACH

Introduction to MACH, Process management in MACH, Communication in MACH, UNIX emulation in MACH.

Text Book:

1. Distributed Operating System – Andrew S. Tanenbaum, PHI.

WIRELESS NETWORKS

BE8232

UNIT I

Wireless Communication Standard: First, Second and Third Generation Wireless Communication Network, Coverage Extension, Types. Characterization of Wireless Channels: Multipath Propagation, Linear Time Variant, Channel Model, Channel Correlation Function, Large Scale Path Loss and Shadowing, Fading.

UNIT II

Band pass Transmission Technique for Mobile Radio, Signal Space and Decision Region, Digital Modulation-MPSK, MSK, GMSK, OFDA, Power Spectral Density, Probability of Transmission Error, Receiver Technique for Fading Dispersive Channels.

UNIT III

CELLULAR COMMUNICATION: Frequency reuse and mobility Management, Cell Cluster Concept, Co-Channel and Adjacent Channel Interference, Call Blocking and Delay at Cell Site, Cell Splitting, Sectoring.

UNIT IV

Multiple Access Technique, Random Access, Carrier Sense Multiple Access(CSMA), Conflict Free Multiple Access Technology and Spectral Efficiency, FDMA, TDMA, CDMA, Mobility management and wireless network-CAC, Handoff Management, Location Management for Cellular Network and PCS network, Traffic calculation.

UNIT V

Wireless Internetworking: Mobile IP, Internet Protocol (IP), Transmission Control Protocol (TCP), Network Performance, Wireless Application Protocol(WAP), Mobile AD-HOC Network.

Text Books:

1. WIRELESS COMMUNICATION & NETWORKING by Mark & Zuang , PHI
2. Wireless Communications And Networks, WILLIAM STALLINGS , PHI

Reference Books:

1. Wireless Network Performance Handbook , by SMITH , McGraw- Hill
2. Principles Of Wireless Networks, By PAHLAVAN , PHI

REAL TIME SYSTEM

BE8233

UNIT I

BASIC REAL- TIME CONCEPTS, COMPUTER HARDWARE, LANGUAGE ISSUES

Basic component Architecture, terminology, Real Time Design Issues, CPU, Memories, Input-Output, Other Devices Language Features, Survey of Commonly Used Programming Languages, Code Generation.

UNIT II

SOFTWARE LIFE CYCLE, REAL TIME SPECIFICATION AND DESIGN TECHNIQUES, REAL TIME KERNELS:

Phases of software life cycle, Non-temporal Transition in the software life cycle, Spiral model, Natural languages, Mathematical Specification, Flow Charts, Structure Charts, Pseudo code and programmable Design Languages, Finite state Automata, Data Flow Diagrams, Petrinets, Statecharts, Polled Loop Systems, phase/State Driven Code, Co routines, Interrupt Driven System, Foreground/Background Systems Full Featured Real Time OS.

UNIT III

INTER TASK COMMUNICATION AND SYNCHRONIZATION, REAL TIME MEMORY MANAGEMENT System

Performance Analysis and Optimization: Buffering Data, Mail boxes Critical Region, Semaphores, Event Flags and Signals, Deadlock, Process Stack Management, Dynamic Allocation, Static Schemes, Response Time Calculation, Interrupt Latency, Time Loading and its Measurement, Scheduling NP Complete, Relocating Response Times And time Loading, Analysis of Memory Requirements, Reducing Memory Loading, I/O Performance.

UNIT IV

QUEUING MODELS, RELIABILITY, TESTING, AND FAULT TOLERANCE, MULTIPROCESSING SYSTEMS

Buffer size Calculation, Classical Queuing Theory, Little's Law, Faults, Failures, bugs AND effects, Reliability, Testing, Fault Tolerance and Classification of Architectures, Distributed Systems, Non Von Neumann Architectures.

UNIT V

HARDWARE/ SOFTWARE INTEGRATION, REAL TIME APPLICATIONS

Goals of Real Time System Integration, Tools, Methodology, The Software Hesisenberg Uncertainty Principle, Real Time Systems As Complex System, First Real Time Application, Real Time Databases, Real time Image Processing, Real Time UNIX, Building Real Time Applications with Real Time Programming Languages.

Text Books :

1. Real Time System, Jane W.S.Liu
2. Real Time Systems Design and Analysis by Phillip A. Laplante, PHI

Reference Books:

1. Hard Real Time Computing Systems Predictable Scheduling Algorithms and applications by Giorgio C. Buttazzo.
2. Real Time Design Patterns: Robust Scalable Architecture for Real Time System by Bruce Powell Douglass
3. Real Time System: Scheduling, Analysis and Verification by Albert M. K. Cheng

CYBER CRIME AND LAWS

BE8234

UNIT I

INTRODUCTION TO CYBER LAW

Evolution of Computer Technology, emergence of Cyber space. CyberJurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, Real Approach, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, Cyberspace-Web space, Web hosting and web Development agreement, Legal and Technological Significance of domain Names, Internet as a tool for global access.

UNIT II

INFORMATION TECHNOLOGY ACT

Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

UNIT III

CYBER LAW AND RELATED LEGISLATION

Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution , Online Dispute Resolution (ODR).

UNIT IV

ELECTRONIC BUSINESS AND LEGAL ISSUES

Evolution and development in E-commerce, paper vs paperless contracts E-Commerce models- B2B, B2C, E security.

UNIT V

APPLICATION AREA

Business, taxation, electronic payments, supply chain, EDI, E-markets, Emerging Trends.

Text Book:

1. Cyber Laws: Intellectual property & E Commerce, Security- Kumar K, dominant Publisher
2. Information Security policy & implementation Issues, NIIT, PHI

Reference Books:

1. Cyber CRIME notorious Aspects of the Humans & net Criminals activity in Cyber World Barna Y Dayal D P Dominant Publisher
2. Cyber Crime Impact in the new millennium, Marine R.C. Author press
3. Spam Attack, Cyber Stalking & abuse, Barna Y, Dayal D P Dominant publisher
4. Frauds & Financial criouses in Cyber space, Barna Y, Dayal D P , Dominant publisher
5. Information Security , NIIT: PHI

ENTERPRISE RESOURCE PLANNING

BE8240

UNIT I

CONCEPTUAL FOUNDATION OF BUSINESS PROCESS REENGINEERING: Role of information Technology and BPR; Process improvement and Process redesign, Process identification and mapping; Role/Activity diagrams, Process Visioning, and benchmarking

UNIT II

ENTERPRISE RESOURCE PLANNING: Evolution of ERP- MRP and MRP II, structure of ERP- two tier architecture, three tier architecture, Electronic data processing, management information system, Executive information system, ERP as an integrator of information needs at various Levels.

UNIT III

TYPICAL BUSINESS PROCESSES: Core processes, Product control, Sales order processing, Purchases, Administrative processes, Human resource, Finance support processes, Marketing, Strategic planning, Research and development, Problems in traditional view.

UNIT IV

ERP MODELS/FUNCTIONALITY: Sales order processing, Production scheduling, forecasting, distribution, finance, features of each of the models, description of data flow across each module, overview of supporting databases & packages.

UNIT V

ERP IMPLEMENTATION ISSUES: Opportunities and problems in ERP selection, and implementation; ERP implementation: identifying ERP benefits, team formation, Consultant intervention, Selection of ERP, Process of ERP.

Text Books:

1. V.K. GARG & N .K. VENKATKRISHNAN:, ERP, Concepts and Practices, PM
2. Rahul V. Altekar, Enterprise wide Resource Planning-theory and practice, PHI

Reference Books:

1. ALEXIS LEON: Enterprise Resource Planning, TMH
2. S. SADAGOPAN: MIS, PM
3. V. RAJARAMAN: Analysis and Design of Information Systems, PHI
4. MONK' & BRADY: Concepts in ERP, Vikas pub, Thomson

BIOINFORMATICS

BE8241

UNIT I

Bioinformatics: Introduction, Application, Data Bases and Data Management, Central Dogma; information search and Data retrieval, Genome Analysis and Gene mapping- Analysis, Mapping, Human Genome Project (HGP).

UNIT II

Alignment of Pairs and Sequences, Alignment of Multiple Sequences and Phylogenetic Analysis, Tools for similarity Search and Sequence Alignment- FASTA BLAST.

UNIT III

Profiles and Hidden Markov Models (HMMs), Gene Identification and Prediction-Basics, Pattern Recognition, Methods and Tools, Gene Expression and Micro arrays.

UNIT IV

Protein Classification and Structure Visualization; Protein Structure Prediction; Proteomics, Computational methods: Analysis of Pathways, Metabolic Network Properties, Metabolic Control Analysis, Stimulation of Cellular Activities, Biological Mark Up Languages.

UNIT V

Drug Discovery: Introduction, Technology and Strategies, Cell Cycle, G-protein, Coupled, Receptors. Computer Aided Drug Design: Introduction, Drug Design Approaches, Designing methods, ADME-Tox Property Prediction.

Text Books:

1. BIOINFORMATICS by S.C. Rastogy, 2nd Edition, Prentice Hall of India.
2. BIOINFORMATICS by V. R Srinivas, Prentice Hall of India

Reference Books:

1. BIOINFORMATIC COMPUTING by Bergeron, MIT Press.
2. Evolutionary Computation in Bioinformatics, Gary B. Fogel, David W. Corne (Editors), 2002
3. Introduction to Bioinformatics, Arthur M. Lesk, 2002, Oxford University Press
4. Current Topics in Computational Molecular Biology (Computational Molecular Biology), Tao Jiang, Ying Xu, Michael Zhang (Editors), 2002, MIT Press

E-COMMERCE AND STRATEGIC IT

BE8242

UNIT I

Introduction: What is E-Commerce, Forces behind E-Commerce, E-Commerce Industry Framework, and Brief History of E-Commerce. Inter Organizational E Commerce, Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework

UNIT II

Network Infrastructure: LAN, Ethernet (IEEE standard 802.3) LAN , WAN , Internet, TCP/IP Reference Model, Domain Name Server , Internet Industry Structure,

UNIT III

Electronic payment systems, types of electronic payment systems, digital token-based electronic payment systems, smart cards & electronic payment systems, credit card based electronic payment systems, risk and electronic payment systems, designing electronic payment systems.

UNIT IV

Information Distribution and Messaging: FTP, E-Mail, WWW server, HTTP, Web service implementation, Information publishing , Web Browsers, HTML, Common Gateway Interface

UNIT V

Mobile & wireless computing fundamentals, mobile computing framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internet networking standards, cellular data communication protocols, mobile computing applications, personal communication service.

Text Books:

1. Frontiers of E-commerce by Kalakota & Whinston (Addison-wesley)
2. E-business roadmap for success by Dr. Ravi Kalakota & Marcia Robinson (addisionwesicy)
1. Electronic Commerce By Bharat Bhasker (TMH)

SOFTWARE PROJECT MANAGEMENT

BE8243

UNIT I

FUNDAMENTALS OF SPM

Essential elements of Software Project Management, rapid development focus, What's a project?, Project vs. Program Management, PM Tools, Project Manager, Gantt Chart, Network Diagram.

UNIT II

PROJECT INTEGRATION MANAGEMENT

Scope, Time, Cost, Quality, Human resource, Communications, Risk, Why Rapid Development, Four Project Dimensions: People, Process, Product, Technology; Technical Fundamentals, Requirements, Project Phases, Phases Variation, Classic Mistakes, PMI Fundamentals, Project Organization, Project Selection, Project Portfolio Management, Procurement Management, Statement of Work (SOW), Project Charter.

UNIT III

PLANNING

Project Phases, Time Allocation by Phase, Remember the 40-20-40 Rule, Concept Exploration, Requirements, Analysis & Design, Development, Integration & Test, Deployment & Maintenance, Lifecycle Planning, Pure Waterfall, Waterfall Risk, Evolutionary Prototyping, Staged Delivery, Process Model, RAD, Dynamic System Development Method (DSDM), Planning, Planning Documents, Product Documents, SDP / SPMP, Communications Management Plan. Work Breakdown Structures (WBS), Estimation, Network Fundamentals, PERT & CPM Techniques, Gantt Charts, Partitioning

Project, WBS Types, WBS & Methodology, WBS Techniques, Estimation Methodologies, Effort Estimation, COCOMO, Financial Analysis of Projects, Payback Analysis, Scheduling, Scheduling Techniques, Network Diagrams, Critical Path, CPM, Task Dependency Relationships, PERT, PERT Example, Milestone Chart.

UNIT IV

RISK AND CHANGE MANAGEMENT

Risk Management, Project Risk, Types of Risks, Risk Identification, Risk Analysis, Risk Control, Risk Resolution, Change Management, Change Control Board (CCB), SCM, Development Management, CMM Levels, Document Analysis, Project Control, Progress Monitoring, Status Reports, Programming Status Reporting, Binary Reporting, Earned Value Analysis (EVA), Derived EVA Variances, Effort-Driven Scheduling.

UNIT V

PROJECT TESTING & PROJECT SUCCESS

Integration & Testing, Validation and Verification, Quality Assurance, Testing, Test Cases, Sources of Defects, Black-Box Testing, White-Box Testing, Unit Testing, Integration Testing, System Testing, Regression Testing, External Testing Milestones, Test Scripts, Static Testing, Automated Testing, Test Tools, Load & Stress Testing, Performance Metrics, Test Metrics, Web Site Testing, Final Stages, Migration Strategies, Project Recovery, Project Success.

Text Books:

1. Project Management, A Managerial Approach. Jack R. Meredith, Samuel J. Mantel, Jr.
2. Software project Management, : A Concise Study, Kelkar, Prentice hall of India

Reference Books:

1. Project Management for Business and Technology- Principles and Practice, Nicholas, Prentice HallOf India
2. Software Engineering, Pressmann, MHI

NANOTECHNOLOGY

BE8244

UNIT I

Introduction to nanotechnology: background, definition , basic ideas about atoms and molecules, physics of solid state, review of properties of matter and quantum mechanics

UNIT II

Preparation of Nanostructured Materials : Lithography : nanoscale lithography, E-beam lithography, dip pen lithography, nanosphere lithography. Sol gel technique Molecular synthesis, Self assembly, Polymerization

UNIT III

Characterization of Nanostructured materials : Microscopy: TEM, SEM, SPM techniques, confocal scanning microscopy,, Raman microscopy-Basic principles, applicability and practice to colloidal, macromolecular and thin film systems. Sample preparation and artifacts. Polymer fractionation techniques: SEC, FFF, Gel electrophoresis.: Basic theory, principles and practice. Thermal analysis: Basic principles, theory and practice. Micro DSC in the study of phase behavior and conformational change. Mass spectrometry of polymers: MALDI TOF MS – Basic theory, principles and practice. Applicability to proteins, Polyethers controlled architecture systems

UNIT IV

Cross-cutting Areas of Application of Nanotechnology: Energy storage, Production and Conversion. Agriculture productivity enhancement Water treatment and remediation. Disease diagnosis and screening. Drug delivery systems. Food processing and storage. Air pollution and remediation. Construction. Health monitoring.. Vector and pest detection, and control. Biomedical applications, Molecular electronics, Nanophotonics. Emerging trends in applications of nanotechnology

UNIT V

Industrial Implications of Nanotechnology: Development of carbon nanotube based Composites, Nanocrystalline silver Antistatic conductive coatings. Nanometric powders. Sintered ceramics. Nanoparticle ZnO and TiO₂ for sun barrier products. Quantum dots for biomarkers, Sensors, Molecular electronics. Other significant implications.

Reference Books:

1. Guozhong Cao, "Nanostructures and Nanomaterials", Imperial College Press, London
2. Mark Ratner and Daniel Ratner, "A Gentle Introduction to Next Big Thing", Pearson Education 2005