

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII
Subject: Artificial Intelligence & Expert System.
Total Theory Periods: 50
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.
Code: 322811 (22)
Total Tut Periods: 12

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 defaults- 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, Backtracking 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) Narosa Publishing House.

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII
Subject: Data Mining and Ware housing.
Total Theory Periods: 40
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.
Code: 322812 (22)
Total Tut Periods: 12

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. Visualisation : 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 & Practice" , Prentice hall of India
3. M.H. Dunham, "Data Mining Introductory and Advanced Topics", Pearson Education.

Name of Reference Books:

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

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII

Subject: Software Project Management.

Total Theory Periods: 40

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322813 (22)

Total Tut Periods: 12

Unit 1 : 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 2: 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 3: 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 4: 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 5: 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.

Name of 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

Name of Reference Books:

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

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII

Subject: **Neural Network and Fuzzy Logic.**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322871 (22)

Total Tut Periods: Nil

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 Perceptron – least mean square algorithm, Multi-layered Perceptrons – Back propagation Algorithm, XOR – Problem, The 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 Rajshekar & Pai, Prentice Hall

Reference Books:

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

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Semester: VIII

Subject : Report Writing and Seminar

Total No. of periods : 28

Total marks in End Semester Exam: Nil

Minimum Number of class test to be conducted: Two

Branch: Common to all branches

Code: 300825 (22)

Total Tutorial Periods : Nil

Teacher's Assessment: 40 marks

Unit - I

Introduction to Technical Writing: how differs from other types of written communication Purpose of technical writing, Correspondence: prewriting, writing and rewriting Objectives of Technical Writing. Audience Recognition: High-tech audience, Low tech audience, Lay audience, Multiple Audience.

Unit - II

Correspondence: Memos, Letters, E-mails, Its differentiation, types of letters, Document Design, its importance, Electronic Communication: Internet, Intranet, extranet, Writing effective e-mail.

Unit - III

Summary: Report Strategies, Effective style of technical report writing: Structures: content, introduction, conclusions, references, etc., Presentation, Writing first draft, revising first draft, diagrams, graphs, tables, etc. report lay-out.

Unit -IV

Report Writing: Criteria for report writing, Types of Report: Trip report, Progress report, lab report, Feasibility report, project report, incident report, etc. Case Studies.

Unit -V

Proposals & Presentation: Title page, Cover letter, Table of Content, list of illustrations, summary, discussion, conclusion, references, glossary, appendix, Case Studies. Oral Presentation/ Seminar:

Text Books:

1. Sharon J. Gerson & Steven M. Gerson "Technical Writing - Process& Product", Pearson Education.

Reference Books:

1. Sunita Mishra, "Communication Skills for Engineers" Pearson Education
2. Davies J.W. "Communication for engineering students", Longman
3. Eisenberg, "Effective Technical Communication", Mc. Graw Hill.

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII

Branch : Common to All Branches

Subject :Enterprise Resource Planning

Code : 300881 (36)

Total Theory Periods : 40

Total Tut Periods : 10

Total Marks in End Semester Exam : 80

Minimum no. of class tests to be conducted : 2

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.

[No of Periods: 8 + 2]

UNIT -2

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.

[No of Periods: 8 + 2]

UNIT -3

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.

[No of Periods: 8 + 2]

UNIT -4

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.

[No of Periods: 8 + 2]

UNIT -5

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.

[No of Periods: 8 + 2]

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

References:

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**

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII
Subject: Artificial Intelligence and Expert System Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40.

Branch: Computer Science & Engg.
Practical Code: 322821 (22)

Experiments to be performed:

- (i) 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.
- (ii) Write a program to find the length of a given list
- (iii) Write a program to find the last element of a given list
- (iv) Write a program to delete the first occurrence and also all occurrences of a particular element in a given list.
- (v) Write a program to find union and intersection of two given sets represented as lists.
- (vi) Write a program to read a list at a time and write a list at a time using the well defined read & write functions.
- (vii) 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'.
- (viii) 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 into wff's, clausal form and deduce that 'One can get to town B from town D'.
- (ix) Solve the classical Water Jug problem of AI.
- (x) Solve the classical Monkey Banana problem of AI.
- (xi) Solve the classical Crypt arithmetic problems such as DONALD + GERALD = ROBERT of AI.
- (xii) Solve the classical Missionary Cannibals problem of AI.
- (xiii) Solve the classical Travelling Salesman Problem of AI.
- (xiv) Solve the classical Blocks World Problem of AI.
- (xv) Write a program to search any goal given an input graph using AO* algorithm.

List of Equipments/Machine required :

- (i) PC with Windows XP
- (ii) Visual prolog compiler

Recommended Books :

- (i) Ivan Bratko : Logic & prolog programming.
- (ii) Carl Townsend : Introduction to Turbo Prolog, (BPB, Publication).
- (iii) W.F. Clocksin & Mellish : Programming in PROLOG (Narosa Publication House)

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII

Subject: **Network Securities Lab**

Total Practical Periods: 40

Total Marks in End Semester Exam: 40.

Branch: Computer Science & Engg.

Practical Code: 322822 (22)

List of Experiments to be performed:

1. Networking Security Programming with TCP/IP for Application layer, Transport layer, Network layer, Datalink 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 New Jersey

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII

Subject: **Software Technology Lab- 5.**

Total Practical Periods: 40

Total Marks in End Semester Exam: 40.

Branch: Computer Science & Engg.

Practical Code: 322823 (22)

List of Experiments to be performed:

1. Write a program in ASP.Net using text box , control, multiline text box & password.
2. Write a program in ASP.Net using events in text box.
3. Write a program in ASP.Net using Labels,Text Box & Button Control.
4. Write a program in ASP.Net using Radiobutton
5. Write a program in ASP.Net using Checkboxlist.
6. Write a program in ASP.Net using Dropdownlist.
7. Write a program in ASP.Net using Listbox.
8. Write a program in ASP.Net using DataList controls.
9. Write a program in ASP.Net using DataList controls with styles.
10. Write a program in ASP.Net for validation in textbox.
11. Write a program in ASP.Net for insertion using ADO.NET .
12. Write a program in ASP.Net for Searching using ADO.NET.
13. Write a program in ASP.Net for Deletion using ADO.NET.
14. Write a program in ASP.Net for Updation using ADO.NET.
15. Write a program in ASP.Net using HTML Server Controls.
16. Write a program in ASP.Net using Web Server Controls.

Text/Reference Books

- 1) Microsoft .NET, Microsoft Press
- 2) ASP.NET, Techmedia

NATIONAL INSTITUTE OF TECHNOLOGY

Semester: VIII
Subject: MAJOR PROJECT.
Total Practical Periods: 7 per week.
Total Marks in End Semester Exam: 100.

Branch: Computer Science & Engg.
Practical Code: 322824(22)

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 counselling 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 encouraged.