



NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR
DEPARTMENT OF INFORMATION TECHNOLOGY

SEMESTER: VII

S.No.	Board of Studies	Sub.Code	Subject Name	Periods/week			Examination Scheme					Total Marks	Credits L+(T+P)/2
				L	T	P	TA	FE	SE	T.C.A.	ESE		
1	Information Technology	IT 701	Management Information System	3	1	-	20	15	15	50	70	120	4
2	Information Technology	IT 702	Artificial Intelligence & Expert Systems	4	1	-	20	15	15	50	70	120	5
3	Information Technology	IT 70X	Elective III	3	1	-	20	15	15	50	70	120	4
4	Information Technology	IT 70Y	Elective IV	3	1	-	20	15	15	50	70	120	4
5	Information Technology	IT 791	Artificial Intelligence & Expert Systems Lab	-	-	3	30	-	-	30	20	50	2
6	Information Technology	IT 792	Management Information System Lab	-	-	3	30	-	-	30	20	50	2
7	Information Technology	IT 793	Practical Training	-	-	-	50	-	-	50	0	50	2
8	Information Technology	IT 794	Minor Project	-	-	12	100	-	-	100	50	150	6
9	Information Technology	IT 795	Seminar and Report Writing	-	-	2	50	-	-	50	0	50	1
			Total	13	4	20	340	60	60	460	370	830	30

Elective III & VI		
Sr.No.	Sub.Code	Subject Name
1	IT 703	Digital image processing
2	IT 704	Advanced Computer architecture
3	IT 705	Fault Tolerant System
4	IT 706	Decision Support System
5	IT 707	Natural Language Processing
6	IT 708	Robotics
7	IT 709	Distributed System & Parallel Processing
8	IT 710	Pattern Reorganization
9	IT 711	Computational Intelligence

Note : For attendance of a student in every theory and practical class, the teachers are supposed to keep records. It is to be included in the following format which will be included in the semester mark-sheets.

T.C.A. = Total of Continuous Assessment.

Format for attendance				
Attendance				Category
> 85			----->	High "H"
> 70 & < 85			----->	Medium "M"
> 60 & < 70			----->	Low "L"
< 60			----->	Poor "P"

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
Department of Information Technology
SEMESTER – VII

“Management Information System”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 701

UNIT - I: MANAGEMENT & ORGANIZATIONAL SUPPORT SYSTEMS FOR DIGITAL FIRM

Definition of MIS; Systems approach to MIS: MIS and Human factor considerations, concept of organizational information sub-system, MIS & problem solving. Information Technology Infrastructure for digital firm. Related Case Studies.

UNIT - II: INFORMATION SYSTEMS & BUSINESS STRATEGY

Information Management. Who are the users? Managers, Decision making & information System, Evolution of Computer based information system (CBIS), Model of CBIS. Changing role of Information systems in organization: Trend to End-User computing, justifying the CBIS, Achieving the CBIS, Managing the CBIS, Benefits & Challenges of CBIS implementation. Strategic Information System, Business level & Firm level Strategy, Case Studies.

UNIT - III: INFORMATION SYSTEMS IN THE ENTERPRISE

Systems from Management & Functional perspective & their relationship: Executive Support System, Decision Support System, Sales & Marketing Information System, Manufacturing Information System, Human-Resource Information System. Finance & Account Information System. Case Studies.

UNIT - IV: INFORMATION TECHNOLOGY FOR COMPETITIVE ADVANTAGE:

Firm in its environment, the information resources, who manages the information resources? Strategic planning for information resources. End-User Computing as a strategic issue, Information resource management concept. Knowledge management & their work system, Business value of information system Related Case Studies.

UNIT - V: INTERNATIONAL INFORMATION SYSTEM:

Managing International Information Systems: IIS architecture, Global business drivers, challenges, and strategy: divide, conquer, appease, cooptation, business organization, problems in implementing global information systems, Understanding ethical and social issues related to systems, ethics in information society, and Moral dimensions of information systems.

Name of Text Books:

1. MIS managing the digital firm, Kenneth C. Laudon & Jane P. Laudon (Pearson Education).
2. MIS, Suresh K. Basandra (Wheelers).

Name of Reference Books:

1. Introduction to computer Information System for Business, Mark G. Simkin. S. Chand & Co., 1996.

2. Analysis & Design of Information Systems, James A. Senn. MC Graw-Hill International edition, 1989.
3. Analysis and Design of information system , V.Rajaraman(PHI)

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
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SEMESTER – VII
“Artificial Intelligence and Expert Systems”

Theory Periods: 40
Credits: 5

Tutorials: “10”
Code: IT 702

UNIT-I: GENERAL ISSUES AND OVERVIEW OF AI

The AI problems; what is an AI technique; Level of model, criteria for success, Characteristics of AI applications, Problem Solving, State Space Search, Production systems, Control strategies: forward and backward chaining, Problem characteristics, Production System characteristics, issues in the design of search program, Data driven and goal driven search, Exhaustive searches: Depth first & Breadth first search.

UNIT-II: HEURISTIC SEARCH TECHNIQUES

Heuristics & Heuristic function, Heuristic Search – Generate & test, Hill climbing; Branch and Bound technique; Best first search & A* algorithm; AND/OR Graphs; Problem reduction and AO* algorithm; Constraint Satisfaction problems, Means End Analysis.

UNIT-III: KNOWLEDGE REPRESENTATION

Introduction to knowledge representation-Propositional calculus, First Order Predicate Calculus, conversion to clause form, Unification, Theorem proving by Resolution, Natural Deduction, Inference Mechanisms Horn's Clauses; Knowledge representation issues-Representation and mapping, Approaches to Knowledge representation, Frame Problem, Structured knowledge representation-Semantic Networks Frame representation and Value Inheritance; Conceptual Dependency and Scripts. Introduction to Agent based problem solving.

UNIT-IV: REASONING UNDER UNCERTAINTY & APPLICATIONS OF AI

Source of Uncertainty, Probabilistic Reasoning and Uncertainty; Probability theory; Bayes Theorem and Bayesian networks, Certainty Factor, Dempster-Shafer theory, Non Monotonic Reasoning, Truth maintenance Systems, Overview of Fuzzy Logic.

Natural language processing: overview, Basic steps followed for the NLP, concept of NLP, Parsing, machine translation, **Planning** Overview - An Example Domain: The Blocks World; Component of Planning Systems; Goal Stack Planning (linear planning); Non-linear Planning using constraint posting. **Learning**, Rote Learning; Learning by Induction, Learning in Problem Solving, Explanation based learning and Discovery.

UNIT-V: GAME PLAYING, AI Languages & EXPERT SYSTEMS

Game Playing Minmax search procedure; Alpha-Beta cut-offs; Additional Refinements, AI Programming Languages: Introduction to LISP and PROLOG, Syntax and Numeric Functions; List manipulation functions, programming in Lisp/Prolog, Iteration and Recursion. Introduction to Expert Systems, characteristics, Architecture of Expert Systems, Development of Expert System, Software Engineering and Expert System, Expert System Life Cycle model, Expert System Shells; Knowledge Acquisition; Case Studies: MYCIN,

Name of 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.

3. Joseph C Giarratano, Gary D Riley: Expert System Principles & Programming, 4th Edition.

Name of Reference Books:

1. Nils J.Nilsson: Principles of Artificial Intelligence- Narosa Publishing house.
2. Artificial Intelligence: A Modern Approach, Stuart Rusell, Peter Norvig, Pearson Education, 2nd Edition.
3. Artificial Intelligence, Winston, Patrick, Henry, Pearson Education.
4. Artificial Intelligenece by Gopal Krishna , Janakiraman.

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SEMESTER – VII

“Digital Image Processing”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 703

Unit I: Introduction

Image formation model, Spatial & Gray level resolution, Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters- smoothing and sharpening, Laplacian filter, Canny edge detector.

Unit II: Image enhancement in frequency domain & Image Segmentation

2D discrete fourier transform & its inverse, filtering in frequency domain, Ideal & Gaussian low pass filters, High pass filtering, FFT, Line detection, Edge detection, Edge linking & boundary detection, Thresholding, Region based segmentation.

Unit III: Morphological Image Processing

Logic operations involving binary image, Dialation & Erosion, Opening & Closing, Applications to Boundary extraction, region filling, connected component extraction.

Unit IV: Image Compression:

Coding redundancy- Huffman coding, LZW coding, run length coding, Lossy compression- DCT, JPEG, MPEG, video compression.

Unit V: Image Representation & 3D:

Boundary descriptors, Shape numbers, Texture, Projective geometry, Correlation based and feature based stereo correspondence, shape from motion, optical flow.

Name of Text Books:

1. Ganzalez and Woods, Digital Image Processing, Pearson education.
2. Sonka and Brooks, Image Processing, TSP Ltd,

Name of Reference Books:

1. Jain and Rangachar, Machine Vision, MGH.
2. Schalkoff, Digital Image Processing, John Wiley and sons.

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SEMESTER – VII

“Advanced Computer Architecture”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 704

Unit - I: Introduction

Parallel Computing, Parallel Computer Model, Program and Network Properties, Parallel Architectural Classification Schemes, Flynn’s & Feng’s Classification, Performance Metrics and Measures, Speedup Performance Laws: Multiprocessor System and Interconnection Networks; IEEE POSIX Threads: Creating and Exiting Threads, Simultaneous Execution of Threads, Thread Synchronization using Semaphore and Mutex, Canceling the Threads.

Unit – II: Pipelining and Memory Hierarchy

Basic and Intermediate Concepts, Instruction Set Principle; ILP: Basics, Exploiting ILP, Limits on ILP; Linear and Nonlinear Pipeline Processors; Super Scalar and Super Pipeline Design; Memory Hierarchy Design: Advanced Optimization of Cache Performance, Memory Technology and Optimization, Cache Coherence and Synchronization Mechanisms.

Unit – III: Thread and Process Level Parallel Architecture

Introduction to MIMD Architecture, Multithreaded Architectures, Distributed Memory MIMD Architectures, Shared Memory MIMD Architecture, Clustering, Instruction Level Data Parallel Architecture, SIMD Architecture, Fine Grained and Coarse Grained SIMD Architecture, Associative and Neural Architecture, Data Parallel Pipelined and Systolic Architectures, Vector Architectures.

Unit – IV: Parallel Algorithms

PRAM Algorithms: Parallel Reduction, Prefix Sums, Preorder Tree Traversal, Merging two Sorted lists; Matrix Multiplication: Row Column Oriented Algorithms, Block Oriented Algorithms; Parallel Quicksort, Hyper Quicksort; Solving Linear Systems: Gaussian Elimination, Jacobi Algorithm; Parallel Algorithm Design Strategies.

Unit –V: Developing Parallel Computing Applications

OpenMP Implementation in ‘C’: Execution Model, Memory Model; Directives: Conditional Compilation, Internal Control Variables, Parallel Construct, Work Sharing Constructs, Combined Parallel Work-Sharing Constructs, Master and Synchronization Constructs; Run-Time Library Routines: Execution Environment Routines, Lock Routines, Timing Routines; Simple Examples in ‘C’. Basics of MPI.

Name of Text Books:

1. Kai Hwang, “Advance Computer Architecture”, TMH.
2. Matthew, “Beginning Linux Programming”, SPD/WROX.
3. Hennessy and Patterson, “ Computer Architecture: A Quantitative Approach”, Elsevier.
4. Dezso and Sima, “Advanced Computer Architecture”, Pearson.

5. Quinn, "Parallel Computing: Theory & Practice", TMH.
6. Quinn, "Parallel Programming in C with MPI and Open MP", TMH Open MP Specification and Usage

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SEMESTER – VII

“Fault Tolerant System”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 705

UNIT - I

Fundamental Concepts: Definitions of fault tolerance, fault classification, fault tolerant attributes and system structure.

Fault-Tolerant Design Techniques: Information redundancy, hardware redundancy, and time redundancy.

UNIT-II

Dependability Evaluation Techniques: Reliability and availability models: (Combinatorial techniques, Fault-Tree models, Markov models), Performability Models.

Architecture of Fault-Tolerant Computers (case study): General-purpose systems, high-availability systems, long-life systems, critical systems.

UNIT - III

Software Fault Tolerance: Software faults and their manifestation, design techniques, reliability models.

UNIT - IV

Fault Tolerant Parallel/Distributed Architectures: Shared bus and shared memory architectures, fault tolerant networks.

UNIT - V

Recent topics in fault tolerant systems: Security, fault tolerance in wireless/mobile networks and Internet.

Name of Text Books:

1. Fault-Tolerant Computer System Design D.K. Pradhan, 2003
2. Design and Analysis of Fault-Tolerant Digital Systems B.W.Johnson, Addison-Wesley, 1989
3. Fault-Tolerant Computing, Theory and Techniques, Volumes I and II D.K. Pradhan, Prentice Hall, 1986
4. Reliable Computer Systems: Design and Evaluation D.P.Siewiorek and R.S.Swartz, Digital Press, 1992
5. Probability and Statistics with Reliability, Queueing and Computer Science Application K.S.Trivedi, Prentice Hall, 1982

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SEMESTER – VII

“Decision Support System”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 706

Unit-I

Strategic, tactical and operational. Consideration of organizational structures. Mapping of databases, MIS, EIS, KBS, expert systems, OR modeling systems and simulation, decision analytic systems onto activities within an organization. Extension to other 'non organizational' areas of decision making. Relationship with knowledge management systems

Unit-II

Studies of human cognition in relation to decision making and the assimilation of information. Cultural issues. Implications for design of decision-making support. Communication issues.

Unit -III

Normative, descriptive and prescriptive analysis: requisite modeling. Contrast with recognition primed decision tools.

Unit -IV

Database, MIS, EIS, KBS, Belief nets, data mining. OR modeling tools: simulation and optimization. History, design, implementation: benefits and pitfalls. Risk assessment, Decision analysis and strategic decision support.

Unit -V

Group decision support systems and decision conferencing. Intelligent decision support systems: tools and applications. Cutting-edge decision support technologies. History, design, implementation: benefits and pitfalls. Deliberative e-democracy and e-participation

Name of Text Books:

1. P.R. Kleindorfer, H.C. Kunreuther, P.J.H. Schoemaker “Decision Sciences: an integration perspective’ Cambridge University Press 1993
1. G.M. Marakas, Decision support Systems in the 21st Century, Prentice Hall, 1999.

Name of Reference Books:

1. E. Turban and J.E. Aronson (2001) Decision support Systems and Intelligent Systems. 6th Edition. PHI
2. V.S.Janakiraman and K.Sarukesi, Decision Support Systems, PHI
3. Efreem G. Mallach, Decision Support and Data Warehouse Systems, tata McGraw-Hill Edition

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SEMESTER – VII

“Natural Language Processing”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 707

Unit - I

Introduction to Natural Language Processing, Different Levels of language analysis, Representation and understanding, Linguistic background.

Unit - II

Grammars and parsing, Top down and Bottom up parsers, Transition Network Grammars, Feature systems and augmented grammars, Morphological analysis and the lexicon, Parsing with features, Augmented Transition Networks.

Unit -III

Grammars for natural language, Movement phenomenon in language, Handling questions in context free grammars, Hold mechanisms in ATNs, Gap threading, Human preferences in parsing, Shift reduce parser Deterministic parsers, Statistical methods for Ambiguity resolution

Unit - IV

Semantic Interpretation, word senses and ambiguity, Basic logical form language, Encoding ambiguity in logical form, Thematic roles, Linking syntax and semantics, Recent trends in NLP.

Unit - V

Language Model: the Milton Model , THE META MODEL, Vision for the Future', Strategies , NLP Change Techniques ,Principle-based NLP, Reframing , Chunking Patterns

Name of Text Books:

1. James Allen, Natural Language Understanding, Second Edition, 2003, Pearson Education.
2. D Juraffsky, J H Martin, Speech and Language Processing, Pearson Education.

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SEMESTER – VII

“Robotics”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 708

Unit- I

The scope of industrial robotics – definition of an industrial robot – need for industrial robots, Applications – fundamentals of robot technology, automation and robotics, robot anatomy, work volume, precision of movement End effectors, sensors.

Unit- II

Robot Programming – methods – interlocks textual languages – characteristics of robot level languages, characteristics of task level languages

Unit- III

Puma robot Arm Control – Computed Torque Technique – Near minimum time control – Variable structure control – Non – linear decoupled feedback control – Reserved motion control – Adaptive control.

Unit- IV

Robot cell design and control – Remote centre compliance – safety in robotics.

Unit- V

Advanced robotics, advanced robotics in space – specific features of space robotics systems – long term technical developments – advanced robotics in underwater operations, Robotics technology for the future – future applications

Name of Text Books:

1. Barry Leatham Jones, “ Elements of Industrial Robotics” Pitman Publishing, 1987 .

Reference Books

1. Mikell P. Groover , Mitchell Weiss, Roger N . Nagel, Nicholas G. Odrey, “Industrial Technology , Programming and applications” , Mc Graw Hill Book Company, 1986
2. Fu K.S. , Gonzalez R.C. and Lee C.S.G , “Robotics – Control, Sensing , Vision and applications” , McGraw Hill International Editions , 1987.
3. Bernard Hodges and Paul Hallam, “Industrial Robotics” , British Library Cataloging in Publication, 1990.

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SEMESTER – VII

“Distributed System and Parallel Processing”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 709

UNIT I

Concept of Distributed system, Centralized Computing, Advantages of Distributed systems over centralized system, Examples of Distributed Systems. Architectural model of Distributed Systems, Centralized Architectures, Decentralized Architecture, Hybrid Architecture, Security in Distributed Systems. Concept of clock in Distributed System, Limitation of Distributed System, Clock synchronization, Lamport’s Logical Clock, Vector Clocks, Causal ordering of messages- Birman-Schiper Stephen Protocol, Schiper Egli Sandoz Protocol, Chandy- Lamport’s Global State Recording Algorithm, Termination Detection Algorithm.

UNIT II

Distributed Mutual Exclusion, Mutual Exclusion in single computer system Vs Distributed, Concept of Critical Section, Non Token-based algorithm- Central Coordinator Algorithm, Lamport’s Algorithm, Ricart-Agrawala Algorithm, Maekawa’s Algorithm, Token based algorithm- Token Ring Algorithm, Suzuki-kasami’s Broadcast Algorithm, Singhal’s Heuristic Algorithm, Raymonds Tree based Algorithm.

Distributed deadlock detection: Control organization- Centralized Vs Distributed, Completely centralized, The Ho-Ramamoorthy , one-phase algorithm, Distributed- path pushing, edge chasing, Diffusion computation based, Global state detection based algorithm, Hierarchical – The Menasce-Muntz Algorithm, The Ho-Ramamoorthy Algorithm, Deadlock Resolution.

Agreement protocol: System model, The Byzantine Agreement problem, Solution to the Byzantine Agreement problem- Lamport Shostak-Pease Algorithm, Dolev et al. algorithm, Applications of Agreement algorithm- Fault tolerant clock synchronization, Atomic commit.

UNIT III

Distributed Storage, Name Services, Transaction, Distributed Transaction, Replication, Recovery in Distributed System, Commit protocol- The Two-Phase commit protocol, Voting Protocol- Static Vs Dynamic voting.

UNIT IV

Computational demands, advantages of parallel systems. Flynn’s classification, controlled parallelism and scalability. Topologies: Mesh, binary tree, Hyper tree, Cube Connected cycles, shuffle-Connected Exchange; Uniform Memory Access (UMA & Non uniform Memory Access (NUMA) Multi processor System. PARAM Model of Parallel Computation, PARAM Algorithms; Parallel Reductions, Prefix sum, List Ranking, Merging of Two Sorted List.

UNIT V

Algorithm for parallel machine- Parallel Algorithm Introduction, Models of Parallel Computation, Parallel Prefix Computation, Parallel Merging, Parallel Searching, Parallel Sorting, Matrix Multiplication.

Name of Text Books:

1. G. Couloris, “Distributed System, Concept & Design,” Addison Wesley 1994.

2. Tanenbaum, "Distributed Systems," PHI.
3. P. K. Sinha, "Distributed Operating Systems," PHI.
4. Michel J. Quinn, "Parallel Computing: Theory and Practice," McGraw-Hill.

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SEMESTER – VII

“Pattern Recognition”

Theory Periods: 30

Tutorials: “10

Credits: 4

Code: IT 710

UNIT-I INTRODUCTION

Introduction to statistical - syntactic and descriptive approaches - features and feature extraction - learning - Bayes Decision theory - introduction - continuous case - 2-category classification - minimum error rate classification - classifiers - discriminant functions - and decision surfaces - error probabilities and integrals - normal density - discriminant functions for normal density

UNIT-II ESTIMATION AND LEARNING

Parameter estimation and supervised learning - maximum likelihood estimation - the Bayes classifier - learning the mean of a normal density - general bayesian learning - nonparametric technic - density estimation - parzen windows - k-nearest neighbour estimation - estimation of posterior probabilities - nearest - neighbour rule - k-nearest neighbour rule

UNIT-III FUNCTIONS

Linear discriminant functions - linear discriminant functions and decision surfaces - generalized linear discriminant functions - 2-category linearly separable case - non-separable behavior.

UNIT-IV PROGRAMMING PROCEDURES

Linear programming procedures - clustering - data description and clustering - similarity measures - criterion functions for clustering

UNIT-V GRAMMAR AND LANGUAGE

Syntactic approach to PR - introduction to pattern grammars and languages - higher dimensional grammars - tree, graph, web, plex, and shape grammars - stochastic grammars - attribute grammars - parsing techniques - grammatical inference

Name of Text Books:

1. Duda & Hart P.E, Pattern Classification And Scene Analysis, John Wiley and Sons, NY

Name of Reference Books:

1. Gonzalez R.C. & Thomson M.G., Syntactic Pattern Recognition - An Introduction, Addison Wesley
2. Fu K.S., Syntactic Pattern Recognition And Applications, Prentice Hall, Englewood cliffs, N.J.

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SEMESTER – VII

“Computational Intelligence”

Theory Periods: 30
Credits:4

Tutorials: “10”
Code: IT 711

UNIT-I

Artificial Intelligence: History and Applications, Production Systems, Structures and Strategies for state space search- Data driven and goal driven search, Depth First and Breadth First Search, DFS with Iterative Deepening, Heuristic Search- Best First Search, A* Algorithm, AO* Algorithm, Constraint Satisfaction, Using heuristics in games- Minimax Search, Alpha Beta Procedure.

UNIT-II

Knowledge representation - Propositional calculus, Predicate Calculus, Theorem proving by Resolution, Answer Extraction, AI Representational Schemes- Semantic Nets,

UNIT-III

Conceptual Dependency, Scripts, Frames, Introduction to Agent based problem solving. Machine Learning- Symbol based and Connectionist, Social and Emergent models of learning,

UNIT-IV

The Genetic Algorithm- Genetic Programming, Overview of Expert System Technology- Rule based Expert Systems, Introduction to Natural Language Processing.

UNIT-V

Languages and Programming Techniques for AI- Introduction to PROLOG and LISP, Search strategies and Logic Programming in LISP, Production System examples in PROLOG.

Name of Text Books:

1. George F Luger, *Artificial Intelligence- Structures and Strategies for Complex Problem Solving*, 4/e, 2002, Pearson Education.

Name of Reference Books:

1. E. Rich, K.Knight, *Artificial Intelligence*, 2/e, Tata McGraw Hill
2. S Russel, P Norvig, *Artificial Intelligence- A Modern Approach*, 2/e, Pearson Education, 2002
3. Winston. P. H, *LISP*, Addison Wesley
4. Ivan Bratko, *Prolog Programming for Artificial Intelligence*, 3/e, Addison Wesley, 2000

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SEMESTER – VII

Semester: VII	Code: IT 791
Subject: Artificial Intelligence & Expert Systems Lab	
Credits: 2	

List of 10 -15 Assignment/Practical will be allotted by the Instructor in the respective Lab.

Semester: VII	Code: IT 792
Subject: Management Information System Lab	
Credits: 2	

List of 10 -15 Assignment/Practical will be allotted by the Instructor in the respective Lab.

Semester: VII	Code: IT 793
Subject: Practical Training	
Credits: 2	

Semester: VII	Code: IT 794
Subject: Minor Project	
Credits: 6	

Semester: VII	Code: IT 795
Subject: Seminar and Report Writing	
Credits: 1	