1. Introduction

Probability Models, Sample Space, Events & their algebra, graphical methods of representing events, Probability Axioms and their applications, Conditional probability, Independence of Events, Bayes’ Rule and Bernoulli Trials[1]

2. Random Variables

Random variables, and their event spaces, Probability mass function, Distribution functions, some discrete distributions (Bernoulli, Binomial, Geometric, Negative Binomial, Poisson, Hypergeometric and Uniform), Probability Generating Function, Discrete random vectors, Continuous random variables: some continuous distributions (Exponential, Hyper exponential, Erlang, Gamma, Normal), Functions of random variables, jointly distributed random variables. [1]

3. Expectation

Introduction, Moments, Expectation of functions of more than one random variable, Brief introduction to Conditional pmf, pdf and expectation, Moments and transforms of some distributions (Uniform, Bernoulli, Binomial, Geometric, Poisson, Exponential, Gamma, Normal), Computation of mean time to failure.[1]

4. Stochastic Processes

Classification of stochastic processes, The Bernoulli process, The Poisson process, renewal process, renewal model of program behaviour. [1]

5. Markov Chains

Computation of n-step transition probabilities, State classification and limiting distributions, Distribution of times between state changes, Irreducible finite chains with aperiodic states, M/G/1 queuing system, Discrete parameter Birth-Death processes, Analysis of program execution time. Continuous parameter Markov Chains, Birth-Death process with special cases, Non-Birth-Death Processes. [1]

BOOKS


1. **Introduction to IPv6**

Overview of IPv6, IPv6 & TCP/IP stack, IPv6 protocol architecture, IPv6 address basics, address notation, unicast address, multicast address, anycast address, IPv6 headers, Routing table problem, static & automatic address configuration, neighbor discovery, stateless address auto configuration, packet filter considerations, IPv6 addresses in the DNS, enabling IPv6 on the DNS server, forward & reverse zones on a primary & secondary servers.

2. **Network services & Routing basics**

Secure shell (Open SSH), NTP, SMTP, HTTP & HTTPS, NFS, TCP & UDP services, Unicast routing basics, ICMPv6 protocol, static dynamic routing with RIPng, RIPng protocol details, Router architecture strategies.


Interoperation concepts, Dual stack servers, Application level gateways, protocol translation, DHCPv6, interoperation problem, authentication and encryption, transport and tunnel mode, Inert key exchange protocol (IKE), open problems.

4. **Mobile networks**

Introduction to mobile IPv4, mobile IPv6, protocol overview of mobile IPv6, enhanced handover schemes, fast handover scheme, network mobility (NEMO), hierarchal mobile IPv6, security in mobile IP, VPN problems & solutions, NSIS firewall, bidirectional tunneling & route optimization

**BOOKS:**


B. Tech 8th Semester (Information Technology)

IT-422 Distributed Operating System

Unit-1: Architecture of distributed O.S.: Introduction, motivation, system architecture type, issues in distributed O.S., Communication primitive.


Unit-3: Distributed dead lock detection: Introduction, dead lock handling strategies, issues in deadlock detection & resolution, Control organization, centralized, distributed & hierarchical detection algorithm.

Unit-4: Distributed file system: Introduction, architecture mechanism for building, design issues, log structured file system.

Unit-5: Distributed Scheduling: Introduction, motivation, issues in load distribution, component of load algorithm, stabilizing load distribution algorithm, performance comparison, selection of a suitable load sharing algorithm, requirement for load distribution, task migration, issues in task migration.

BOOKS:


2. A S Tanenbaum, Modern operating systems, PHI.

3. A. Silberschatz, P.Galvin, G.Gagne, Applied operating system concepts, Wiley
1. Introduction & Network Infrastructure of E-Commerce

E-commerce framework, E-Commerce & media convergence, Anatomy of E-Commerce applications, E-Commerce Consumer & Organizational Applications. Market forces influencing i-way, Components of i-way, Network access equipment, Global information distribution networks, Public issues shaping the i-way.

2. E-Commerce & World Wide Web and Consumer oriented E-Commerce


3. Electronic Payment Systems and interorganizational Commerce & EDI


4. Interorganizational E-Commerce and Consumer search and Resource Discovery

Internal information systems, Macro forces and Internal Commerce, Work-flow automation and coordination, customization and internal commerce, SCM, search and resource discovery paradigms, information search and retrieval, E-Commerce catalogs or directories, information filtering, Computer based training and Education, digital Copyrights and E-Commerce.

**BOOKS:**


B. Tech 8th Semester (Information Technology)

IT-426 Artificial Intelligence

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Unit-1 : Introduction:** Definition of AI, Evolution of Computing, History of AI, Classical, Romantic and Modern period, subject area, Architecture of AI machines, logic family, Classification of logic.

**Unit-2: Production System:** Production rules, the working memory, Recognize-act cycle, conflict resolution strategies, refractoriness, Recency, specificity, alternative approach for conflict resolution by Meta rules, Architecture of production system.

**Unit-3: Propositional Logic:** Proposition, tautologies, Theorem proving, Semantic method of theorem proving, forward chaining, backward chaining, standard theorems, method of substitution, theorem proving using Wang’s algorithm.

**Unit-4: Predicate Logic:** Alphabet of First order logic (FOL), predicate, well formed formula, clause form, algorithm for writing sentence into clause form, Unification of predicates, unification algorithm, resolution Robinson’s inference rule, Scene interpretation using predicate logic.

**Unit-5: Logic Programming with Prolog:** Logic program, Horn clause, program for scene interpretation, unification of goals, SLD resolution, SLD tree, flow of satisfaction, controlling back tracking using CUT, common use of CUT, implementation of backtracking using stack, risk of using cuts, fail predicate, application of cut-fail combination, replacing cut-fail by not.

**Unit-6: Default and Non monotonic Logic:** Axiomatic theory, Monotonicity Vs Non-Monotonicity, non-atomic reasoning using McDermott’s NML-I, problems with NML-I, reasoning with NML-II, Case study of Truth Maintenance System (TMS), Neural network fundamentals.

**Unit-7: Imprecision and Uncertainty:** Definition, Probabilistic techniques, Certainty factor based reasoning, conditional probability, medical diagnosis problem, Baye’s Theorem and its limitations, Bayesian belief network, propagation of belief, Dempster-Shafer theory of uncertainty management, belief interval, Fuzzy relation, inverse Fuzzy relations, Fuzzy post inverse, Fuzzy Inversion.

**Unit-8: Intelligent Search Technique:** Heuristic function, AND-OR graph, OR graph, Heuristic search, A* algorithm and examples.

**BOOKS:**

2. E.Charniak and D. McDermott, Introduction to Artificial Intelligence, Addison Wesley Longman.
4. Rich and Knight, Artificial Intelligence, 2/e, 1992
B. Tech 8th Semester (Information Technology)

IT-428 Embedded System

L T P
3 1

1. **Introduction**

2. **Processors**
   ARM and SHARC processors- processor and memory organization, data operations, flow of control, input and output devices and primitives, busy-wait I/O, interrupts, supervisor mode, exceptions, traps. Memories: Caches, MMUs and address translation; CPU Performance: pipelining, super scaling execution, caching, CPU power consumption.

3. **Interfaces and Communication Mediums**
   Bus protocols, DMA, system bus configurations, ARM Bus, SHARC Bus, Memory Devices-organization and types, I/O Devices-timers and counters, ADC and DACs, keyboards, LEDs, Displays and touch screens, Interfacing-memory and device interfacing. Designing with microprocessors.

4. **Programming an Embedded System**
   Program design patterns for embedded systems, data flow and control/data flow graphs, analysis and optimization of execution time, energy, power, and program size. Processes: multiple tasks and processes, context switching, Operating Systems: Process state and Scheduling, O.S. Structure, timing requirements on processes, interprocess communication and mechanisms.

5. **Examples and Case Studies.**

**BOOKS:**


**REFERENCE BOOKS:**

B Tech 8th Semester (Information Technology)

IT-430 E-Governance

L T  P
3  1

1. Introduction


2. E-Governance Models

Introduction, Models of Digital Governance, Evolution in E-Governance, Maturity Models, Characteristics of Maturity Levels, Key Focus Areas. [1]

3. E-Governance Infrastructure

Introduction to E-Governance Infrastructure, Stages in Evolution & Strategies for Success, E-readiness, Evolutionary Stages in E-Governance. [1]


BOOKS:


1. **Introduction**

Origin, imposition, representation, role of knowledge, use of prolog for Natural Language Processing (NLP), Finite State Transition Networks(FSTN), notation, representation and traversal of FSTN in Prolog, Finite State Transducers(FST), implementation in Prolog, limitation of SM.

2. **Recursive and Augmented Transition Networks (RTN)**

Modeling recursion, representation, traversal, implementation in Prolog, push down transducers, implementation, advantage and limitations of RTN, augmented transition networks.

3. **Grammar and Parsing**

Grammar as knowledge representation, words, rules, structures, representation in Prolog, sub categorization, definite clause grammars, classes of grammars and languages, top down and bottom up parsing, comparison strategies, BFS and DFS, storing intermediate results, ambiguity, determinism and lookahead.

4. **Well formed Sub-string tables and Charts**

Well formed substring tables, active charts, rules of chart parsing, initialization, rule invocation, house keeping, implementation of top down and bottom up chart parsers, search strategy, alternative rule invocation, implementing flexible control, efficiency.

5. **Features and the Lexicon**

Feature theoretic syntax, feature structures as graphs, feature structures in Prolog, subsumption and unification, the status o rules, implementing PATR in Prolog, chart parsing with feature-based grammars, representation of lexical knowledge, implementing a lexicon in Prolog, DAGs versus terms

6. **Semantics**

Compositionality, meaning as reference, translation to a meaning representation language, computational semantics as feature instantiation, transitive verbs and quantification, ambiguity, preferences and timing, building semantic checking in to the grammar.

7. **Question answering and Inference**

Question answering, evaluating DBQ formulae, standard logical inference, implementing forwards inference in Prolog, the pathological nature of logical inference, primitives and canonical forms, classes and inheritance, plausible inference and defaults
BOOKS:
1. Gerald Gazdar and Chris Mellish, Natural Language Processing in Prolog, Addison Wesley.
2. Allen James, Natural Language Understanding, Benjamin Cummins
4. Schwartz, Steven C, Applied Natural Language Processing, Petrocelli.
1. **Introduction**

Multimedia – Definitions, CD-ROM and the Multimedia Highway, Uses of Multimedia, Introduction to making multimedia – The Stages of project, the requirements to make good multimedia, Multimedia skills and training, Training opportunities in Multimedia. Motivation for multimedia usage, Frequency domain analysis, Application Domain & ODA etc.Multimedia-Hardware and Software: Multimedia Hardware – Macintosh and Windows production Platforms, Hardware peripherals – Connections, Memory and storage devices, Media software – Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards.

2. **Tools & Multimedia building blocks**

Multimedia – making it work – multimedia building blocks – Text, Sound, Images, Animation and Video, Digitization of Audio and Video objects, Data Compression: Different Compression algorithms concern to text, audio, video and images etc., Working Exposure on Tools like Dream Weaver, 3D Effects, Flash Etc.,

3. **Multimedia and the Internet**


4. **Multimedia Current Developments**

Multimedia-looking towards Future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing,

Assembling and delivering a project-planning and costing, Designing and Producing, content and talent, Delivering, CD-ROM technology.

**BOOKS:**

1. Create a calculator that can be used for adding subtracting multiplication and division.

2. Write an application to use WMI to retrieve information about your pc.

3. Write an application to create a File & Folder Browser.

4. Write a program in VB.NET to send an E-Mail via SMTP.

5. Write a program to create a MDI web browser.

6. Write an application to access the registry in VB.NET.

7. Write a program to retrieve a web page source.

8. Create a slot machine game using standard controls & random number generator.

9. Write a program to create a word processor.

10. Write a program for encryption & decryption.

11. Write an application to capture screen.

12. Create a drawing application in VB.NET.

13. Write an application in VB.NET to play MP3 files