

NATURAL LANGUAGE PROCESSING

Section A

Introduction: Knowledge in speech and Language processing, Ambiguity, Models and Algorithms, Language, Thought, and Understanding, The state of the Art and the Near-Term future, Some Brief History, Foundational Insight: 1940s and 1950s, The Two Camp: 1957-1970, Four paradigms: 1970-1983, Empiricism and finite State Models Redux: 1983-1993, The field comes Together: 1994-1999, On Multiple Discoveries.

Regular Expressions and Automata: Regular Expression, Basic Regular Expression patterns, Disjunction, Grouping and Precedence, Example, Advanced Operators, Regular Expression Substitution, Memory, and ELIZA, Finite-State Automata, Using an FSA to recognize Sheeptalk, Formal Languages, Another Example, Non-Deterministic FSAs, Using an NFSA to Accept Strings, Recognition as Search, Relating Deterministic and Non-Deterministic Automata, Regular Languages and FSAs.

Section B

Context-Free Grammars for English: Constituency, Context-Free rules and Trees, Sentence-Level Constructions, The Noun Phrase, Before the Head Noun, After the noun, Coordination, Agreement, The Verb phrase and sub categorization, Auxiliaries, Spoken Language Syntax, Disfluencies, Grammar Equivalence and Normal form, Finite-State and Context-free Grammars, Grammars and Human Processing, Summary, Bibliographical and Historical, Notes, Exercises. Parsing with Context-Free Grammars: Parsing as Search, Top-Down Parsing, Bottom-up Parsing, Comparing Top-Down and Bottom-up Parsing, A Basic Top-Down Parser, Adding Bottom-up Filtering, Problems with the Basic Top-Down parser, Left-Recursion, Ambiguity, Repeated Parsing of Subtrees, The Earley Algorithm, Finite-State parsing Methods.

Constraints: Integrating Unification into an Earley Parser, Unification Parsing; Types and Inheritance, Extensions to Typing, Other Extensions to unification.

Section C

Representing Meaning: Computational Desiderata for representations, Verifiability, Unambiguous Representations, Canonical Form, Inference and Variables, Expressiveness, Meaning Structure of Language, Predicate-Argument Structure, First Order Predicate Calculus, Elements of FOPC, The Semantics of FOPC, Variables and Quantifiers, Inference, Some Linguistically Relevant, Concepts, Categories, Events, Representing Time, Aspect, Representing Beliefs, Pitfalls, Related Representational Approaches, Alternative approaches to Meaning, Meaning as Action, Meaning as Truth.

Semantic Analysis: Syntax-driven Semantic analysis, Semantic Augmentations to Context-Free Grammar Rules, Quantifier Scoping and The Translation of Complex-Term, Attachments for a Fragment of English Sentences, Noun Phrases, Verb Phrases, Prepositional Phrases, Integrating Semantic Analysis into the Earley Parser, Idioms and Compositionality, Robust Semantic Grammars, Information Extraction.

Section D

Discourse: Reference Resolution, Reference Phenomena, Syntactic and Semantic: Preferences in Pronoun Interpretation, An Algorithm for pronoun Resolution, Text Coherence, The Phenomenon, An Interference Based Resolution Algorithm, Discourse Structure, Psycholinguistic Studies of References and Coherence.

Natural Language Generation: Introduction to Language generation, An Architecture for generation, Surface Realization, Systemic Grammar, Functional Unification Grammar, Summary, Discourse Planning, Text Schemata Rhetorical Relations, Summary, Other Issues, Microplanning, Lexical Selection, Evaluating Generation Systems, Generating Speech.

MODELING AND SIMULATION

Section A

Definition of systems: Types of system, continuous and discrete modeling process and definition of a model. Common type of mathematical models used for engineering and non-engineering system (such as differential and partial differential equation models).

Section B

Simulation Process: Discrete and continuous simulation procedures. Random number generation and its testing discrete and continuous random variables, density and distributive functions, study of few distributions such as Poisson, Norma.

Section C

Simulation of Queuing System: Elementary idea about networks of queuing with particular emphasis to computer system, environment (refer to section 9.1,9.2 & 9.3 of Trivedi's book.)

Verification & Validation: Design of simulation experiments and validation of simulation experiments comparing model data units and real system data.

Section D

Simulation Language: A brief introduction to important discrete and continuous languages such as GPSS (Study & use of the language). Use of data base & AI techniques in the area of modeling and simulation.

Books:

1. Deo, Narsing: System Simulation with Digital Computers.
2. Gordon G: System Simulation, Prentice Hall (Two books above can be used as text books).
3. Shridhar Bhai Trivedi, Kishore: Probability & Statistics with reliability Queuing, Computer science Application.
4. Payer, T.A., Introduction to System Simulation, McGraw Hill.
5. Reitman, J., Modeling and performance measurement of Computer System.
6. Spriet, WI A., Computer Aided Modeling and Simulation (Academic Press).

E – COMMERCE & ERP

Section A

Introduction and Concepts: Networks and Commercial Transactions – Internet and other novelties: networks and electronic transactions today, Model for commercial transactions; Internet environment – Internet advantage, worlds wide web and other Internet Sales venues; online commerce solutions.

Electronic Payment Methods: Updating traditional transactions; secure online offline secure processing; private data networks, Security protocols.

Section B

Electronic Commerce Providers: On-line Commerce options; Company profiles, Electronic Payment System: Digital payment system; First virtual Internet payment system; cyber cash model. On-line Commerce environments; E-commerce Servers.

Digital Currencies Operational process of Digicash, Ecash Trail; Using Ecash; Smart cards;

Section C

ERP – an Enterprise Perspective: Production finance, Personnel disciplines and their relationships, Transiting environment, MIS Integration for disciplines, Information / workflow, Network Structure, Client Server Integrator System, Virtual Enterprise.

ERP – Resource Management Perspective: Functional and Process of Resource, Management, Introduction to basic Modules of ERP System: HRD, Personnel Management, Training and Development, Skill Inventory, Material Planning and Control, Inventory, forecasting, Manufacturing, Production Planning, Production Scheduling, Production Control, Sales and Distributions, Finance, Resource Management in global scenario.

ERP – Information System Perspective: Functional to OLAP (Online Analysis and Processing), TP, OAS, KBS, MRP, BPR, SCM, REP, CRM, and Information Communication Technology.

ERP – Key Managerial Issues: Concept Selling, IT Infrastructure, Implication, of ERP System on business Organization, Critical success factors in ERP System, ERP Culture Implementation Issues, resistance to change, ERP Selection issues, return on Investment, pre and post Implementation Issues.

Books:

1. Ravi lalakota, Andrew Whinston: Frontiers of Electronics Commerce, 1996, Addison Wesley.
2. V.K. Garg and N.K. Venkita Krishna: Enterprise Resource Planning – Concepts and practice, 1998, PHI.
3. John Antonio, Fernandz: The SAP/3 Handbook, TMH.
4. Denial Amor: The E-Business Revolution, Addison Welsey.
5. From Edi to E-Commerce: A Business Initiative: Sokol TMH.
6. Greenstein and Feinman: E-Commerce, TMH.
7. Diwan, Sharma: E-Commerce Excel.
8. Asset International “ Net Commerce”, TMH.
9. E-Commerce – Jaffrey F. Rayport, Bernard J. Jaworski, 2002, TMH.
10. Bajan and Nag: E-Commerce: The cutting Edge of Business, TMH.
11. Electronic Commerce – Security, Risk Management and Control, Greenstein, Geinman, 2002, TMH.

INTERNET TECHNOLOGY

Section A

Introduction to Java, Difference between C/C++ and Java, Applets and Applications, Java Development Kit, Advantages of Java, Classes, Inheritance (Single, Multilevel, Hierarchical), Multiple Inheritance using Interfaces, Arrays, Strings and Vectors, Java packages, Exception handling, Multithreading Apples, Graphics and AWT.

Section B

Multithreading: Java Thread Model, Thread Priorities, Creating Multiple Threads, Synchronization, Inter thread communication.

Applets: Applet Basic, Applet Architecture, Display Methods, HTML APPLET tag.

Event Handling: Event Handling Models, Event Classes, Event Listener Interfaces, Adapter Classes.

AWT Classes: Window fundamentals, working with frames windows, panels, working with color, fonts, AWT Controls, Layout Manager & Menus.

Section C

Swing: Swing components classes and their brief description such as buttons, boxes, panes, tables, fields and trees.

JDBC: Java as a database front end, Database Client/Server methodology, Two-and three-tier database design, The JDBC API, A JDBC Database example.

Section D

Java Beans: The Java Bean component model, The Java “Bean”, Bean introduction and customization, Simple Bean applications.

Servlets: Servlet engines, Life cycle of servlets, Run-time environment, Servlet exceptions.

BOOKS:

1. Programming with JAVA, John R. Hubbard, Schaum’s Outline Series, McGraw Hill, New York.
2. Java Script, Don Gosselin, Thomson Learning, Cambridge, 2000.
3. Programming with Java, E. Balagurusamy, Tata McGraw Hill, New Delhi, 2002
4. The Complete Reference, Java 2, 3rd Edition, Patrick Naughton, Herbert Schildt, Tata McGraw Hill.

INTERNET TECHNOLOGY LAB

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

Programming in Java Script, ASP and JAVA / Swing / JDBC / Servlets / Beans.

* To be done in consultation with the faculty incharge for the course and should lead to the projects in groups of two.

1. Write an application that demonstrates some static method of character class.
2. Create a string buffer object to illustrate how to -
 - (a) Display capacity and length of string buffer
 - (b) Insert character at the beginning.
 - (c) Append & Reverse the string.
3. Write a program that display all the factors of a number entered by user: e.g. If entered 8 it would response with 2 & 4.
4. Write an application that defines sphere class with three constructors first from accepts no arguments. It assume that sphere is centered at origin & has radius of one unit. The record from accept one double value and represents radius and centered at origin, third from accepts four double arguments and specify radius and origin.
5. Write down a programme to implement polymorphism using
 - (a) Overloading
 - (b) Overriding
6. Write a programme that illustrate how to use throw statement, create class that has static method main (), a (), b (), c () and d (). Mmain invokes a (), a () invokes b (), b () invokes c() and so on. Method d () declares an array with ten elements and then attempts to access 20th element. Therefore array index out of bond exception is generated.

Write an application that execute two threads one after another, Create threads by implementing.

 - (a) Thread Class
 - (b) Runnable Interface.

Write a Multithreaded programme that simulate a set of grasshoppers jumping around in a bod. Each grasshopper jumps to a different location.
Every 2 to 12 seconds. Display the new location of grasshopper after each of these jumps.
Write down programme in java to implement following in java.

 - (a) Linked List
 - (b) Vector Class
 - (c) Hashtable
 - (d) Enumeration

MODELING AND SIMULATION LAB.

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

(For all the given exercise student has to make GUI)

1. Write a programme for the random number generation and do its testing and validation for various discrete and random variables.
2. Do the modeling and simulation of queuing system (i.e. in computer system).
3. Do the modeling and simulation of the ATC (Air Traffic Control System).
4. Do the modeling and simulation of the Monte-Carlo method.
5. Study the GPSS and implement various programme in it.

E- COMMERCE LAB.

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

This laboratory will be self-exploratory in nature with the undertaking of case studies such as by culling information from the Internet on

- a) Pay roll
- b) Back office accounting
- c) Supply chain
- d) Order Processing
- e) Shipments
- f) Web and Value addition to traditional business
- g) Study of packages such as SAP oracle.

At the end of the laboratory a student is expected to make a presentation of his exploration in the area of e-commerce and ERP.

PROJECT –I

Instructions for paper setter / Candidates

This Seminar / Viva will be conducted on the project done by the candidate.

At the time of seminar / viva-voce the industry guide / supervisor be invited.

VOCATIONAL TRAINING

Instructions for paper setter / Candidates

This training will be related to Industrial Projects / Software Projects to be undertaken under the guidance of Faculty preferably at Industry / Software Park / Incubation Centre or related areas. This may also be undertaken with in the Institute. The training will be undertaken during vacation. Student is supposed to submit the project report at the end of the training.

Evaluation will be based on Project Report presentation and comprehensive Vive-voce examination related to the project.

OPEN ELECTIVE-I

OPERATIONAL RESEARCH

Section A

Operations Research: Basic Concept, Definitions, Origin and development; Characteristics of O.R., Models in O.R., Steps (Phases) of O.R. Techniques; uses and limitations of O.R. Linear Programming: Basic Concepts, Problem Formulation and Graphical Solution.

Section B

Linear Programming: Mathematical Statement of the Problem, General, Canonical and Standard forms of LPP, Basic Feasible Solutions, Simplex Method of LPP; Special Cases:

- (i) Infeasible Solution
- (ii) n-bounded Solution
- (iii) Multiple Optimum Solutions
- (iv) Cases of Degeneracy and cycling
- (v) Cases of duality: Primal and dual Comparisons, Economic – Interpretation, Optimal solutions, Primal and dual problems and theorems of duality.

Section C

Transportation Problem: Basic Concepts, matrix form, Basic feasible solution using various methods, Optimal Solutions for Balanced and Unbalanced Transportation Problem, assignment problem; Balanced and Unbalanced Assignment problem, Traveling salesman Problem.

Section D

Inventory Control: Basic Concepts: Factors effecting Inventory Control; Simple EOQ models with demand Known and uniform, shortages back logged, Production instantaneous or uniform.

Selective Inventory control: ABC and BED analysis Queuing theory Basic concepts; Characteristic; M/M/I model.

Books:

1. Kanti Swarup, "Operations Research".
2. N.G.Nari, "Operations Research".
3. Hearn and Gupta, "Operations Research".
4. S.D.Sharma, "Operations Research".
5. Goel and Mittal, "Operations Research".
6. V.K.Kapoor, "Problem and Solutions in Operations Research".

HUMAN VALUE

Section A

The Value – crisis in the contemporary Indian Society.

The nature of Values: The value spectrum for a 'good life'.

The Indian System of values.

Section B

Material development and its values: the challenge of science and technology.

Psychological values: integrated personality; mental health.

Societal values: the modern search for a 'good' society; justice, democracy, rule of law; values in the Indian constitution.

Section C

Aesthetic Values: perception and enjoyment of beauty.

Moral and ethical values: nature of moral judgments; canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility.

Work ethics: professional ethics.

Section D

Spiritual values: different concepts; secular spirituality.

Relative and absolute values.

Human values: Humanism and human values; human rights; human values as freedom, creativity, love and wisdom.

Management by values: professional excellence; inter-personal relationships at work place; leadership and team building; conflict resolution and stress management; management of power.

BOOKS:

1. Education in human values Burrows.L., Sri Sathy Sai Books and Publishing Trust, Prasanthi Nilayam.
2. Value Education: A Philosophical Study (Published thesis) N.N.Kar, The associated publishers, 2963/2 Kacha Bazar, PO Box No. 56, Ambala Cantt., 133001 India.
3. Education in Human Values, Madhu Kapani, Sterling Publishers.
4. Human Values and Education, Dr. S.P. Ruhela, Sterling publishers, Pvt. Ltd. Green park Extension New Delhi, 110016

ACCOUNTS AND FINANCIAL MANAGEMENT

Section A

Accounting: Principle, Concepts and conventions, double entry system of accounting, introduction of basic books of accounts of sole proprietary concern, control accounts for debtors and creditors, closing of books of accounts and preparation of trial balance.

Final Accounts: Trading, Profit and Loss Accounts and balance sheet of sole proprietary concern with normal closing entries. Introduction to manufacturing account, Final accounts of Partnership firms, Limited company.

Section B

Financial Management: Meaning and role.

Ration Analysis: Meaning, advantages, limitations, types of rations and their usefulness.

Fund Flow Statement: Meaning of the terms – fund flow and fund working capital cycle, preparation and interpretation of the fund flow statement.

Section C

Costing: Nature, Importance and basic principles, Budget and budgetary control: Nature and scope, importance, method of finalization of master budget and functional budgets.

Marginal Costing: Nature, Scope and importance, break – even analysis, its uses and limitations, construction of break-even chart, practical application of marginal costing.

Section D

Standard Costing: Nature and Scope, Computational and analysis of variances with reference to material cost, labour cost and overhead cost, interpretation of the variances.

Introduction to computerized accounting system: coding logic and codes required, master files transaction files; introduction to documents used for data collection, processing of different file sand output obtained.

BOOKS:

1. Rockely, L.E.: Finance for the Non-Accountant, 2nd Edition, and basic books, 1976.
2. Levy, and Sarnet: Principle of Financial Management, Prentice – Hall International.

WIRELESS COMMUNICATION

Section A

Introduction to Wireless Communication System: Evolution of mobile radio communication, examples of wireless comm. system, paging system, Cordless telephone system. Comparison of various wireless systems.

Modern Wireless Communication System: Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, blue tooth and personal area networks.

Section B

Introduction to Cellular Mobile System: Spectrum Allocation, basic cellular system, Performance Criteria. Operation of Cellular System, Analog cellular system, Digital Cellular System.

Cellular System Design Fundamentals: Frequency Reuse, Channel assignment strategies, handoff strategies. Interference and System capacity, tracking and grade off service, Improving Coverage and capacity.

Section C

Multiple Access Techniques for Wireless Communication: Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum Multiple Access, Space division multiple access, packet ratio, capacity of a cellular system.

Wireless Networking: Difference between wireless and fixed telephone networks, Development of Wireless Networks, Wireless Data Services, Common Channel Signaling, ISDN (Integrated Service Digital Network, Advanced Intelligent Networks.

Section D

Intelligent Cell Concept and Application: Intelligent cell concept, Application of Intelligent – cell system, In Building Communication, CDMA Cellular Radio Networks.

Books:

1. Wireless Communication: Theodore S. Rappaport: Pearsons.
2. Mobile Cellular Telecommunication: W.C.Y.Lee: McGraw Hill.
3. Mobile Communications: Jochen Schiller; Pearson.

7th semester