Rashtriya Sanskrit Vidyapeetha
(Deemed University)
Tirupati – 517 507.
Department of Computer Science
M. Sc. Computer Science and Sanskrit Language Technologies
2019 - 2020
Semester wise Syllabus

S.No.	Semester	Paper	Title of the Paper	Credits
First Semester				
1.	I Semester	1	Data Structures	4
2.	I Semester	2	Computer Organization	4
3.	I Semester	3	Object Oriented Programming with Java	4
4.	I Semester	4	Natural Language Processing – I	4
5.	I Semester	5	Sanskrit Linguistics – I	4
6.	I Semester	Lab 1	Data Structures Lab	4
7.	I Semester	Lab 2	Object Oriented Programming with Java Lab	4
Second Semester				
8.	II Semester	6	Operating Systems	4
9.	II Semester	7	Data Base Management Systems	4
10.	II Semester	8	Computer Networks	4
11.	II Semester	9	Natural Language Process – II	4
12.	II Semester	10	Sanskrit Linguistics – II	4
13.	II Semester	Lab 1	Data Base Management Systems Lab	4
14.	II Semester	Lab 2	Natural Language Processing Lab	4
Third Semester				
15.	III Semester	11	Software Engineering	4
16.	III Semester	12	Artificial Intelligence	4
17.	III Semester	13	Programming with Visual Basic	4
18.	III Semester	14	Natural Language Processing – III	4
19.	III Semester	15	Sanskrit Linguistics – III	4
20.	III Semester	Lab 1	Programming with Visual Basic	4
21.	III Semester	Lab 2	Natural Language Processing Lab	4
Fourth Semester				
22.	IV Semester		Project Work	8

Programme Name: MSc(Computer Science and Language Technology) I year I semester

Course No: Paper 1. Data Structures

Name of the Text Book:

Prescribed Textbook:

1. SamanthaD, ClassicDataStructures,Prentice - Hallof India

Reference Books:

1. D S Malik, DataStructuresUsingC++, Thomson, India Edition.
2. Sahani S, DataStructures,AlgorithmsandApplicationsinOt +, McGraw - Hill,.
3. Heilman G I,. DataStructures,AlgorithmsandObject - OrientedProgramming,TataMcGraw - Hill..
4. Tremblay P, and Sorenson P G, IntroductiontoDataStructuresandApplications,Tata McGraw - Hill
5. Drozdek A, DataStructuresandAlgorithmsinC++), 2nd edition, Vikas Publishing House.
6. Kanetkar Y P, DataStructuresthroughC++, BPB Publications.

General Objective of the Course: The course is designed to develop skills to design and analyze simple linear and non linear data.

Objective of UNIT I: Introduction to different data types, arrays, stacks and queues.

Objective of UNIT II: The main objective of this unit is to learn linear linked list.

Objective of UNIT III: Here we discuss about Trees and traversals

Objective of UNIT IV: This unit makes clear study of Graphs, Searching, Depth First Search and Breadth first search methods.

Objective of UNIT V: Discusses about sorting and merging, Linear and Binary search techniques.

Detailed syllabus

Unit I

Introduction to Data Structures: primitive data structures: integer, float, character, Boolean – arrays – Stacks: push and pop operations – Queues: insert and delete operations. - Circular queues.

Unit II

Linear Linked Lists: creating a linked list, inserting a node and deleting node in linked list. - Double linked list – Circular linked list.

Unit III

Trees : Binary trees – inserting a node in a binary tree, deleting a node in binary tree, searching a node in a binary tree Tree traversal : Pre - order, Post - order and in - order traversals.

Unit IV

Graphs: Basic concepts, Representations: adjacency lists, adjacency Matrix, Searching, Depth First Search and Breadth first search methods.

Unit IV

Sorting: Bubble sort, Insertion sort, quick sort, selection sort – Merging, Searching: Linear search & Binary search.

LAB: Data Structures (100 Marks)

Programme Name: MSc(Computer Science and Language Technology) I year I semester

Course No: Paper 2. Computer Organization

Name of the Text Book:

Prescribed Textbook:

1. M.Morris Mano, Computer System Architecture, Third edition, PHI

Reference Textbook:

1. John Hazu, Computer Architecture & Organization, third Edition, Tata McGraw Hill

General Objective of the Course: This course is intended to teach the basics involved in data representation and digital logic circuits used in the computer system. This includes the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design. This course will also expose students to the basic architecture of processing, memory and i/o organization in a computer system.

Objective of UNIT I: Introduction to digital logic circuits, digital components discussed.

Objective of UNIT II: The main objective of this unit is about register transfer and micro operations in detail.

Objective of UNIT V: Discusses basic computer organization and design.

Objective of UNIT IV: The students will be able to know about micro programmed control, interrupts and stack organization

Objective of UNIT V: This unit makes clear study of I/O interface, memory hierarchy

Detailed syllabus

UNIT I

Digital Logic circuits: Digital computers – gates – Boolean algebra – map simplification – combinational circuits–flip flaps sequential circuits. Digital components: Integrated circuits– Decodes multiplexes–registers–shift registers–binary counting memory unit.

UNIT II

Register transfer and micro operations: register transfer language–register transfer–Bus and memory transfer–Arithmetic micro operations–logic micro operations–shift micro operations – arithmetic logic shift unit.

UNIT III

Basic computer organizations and Design: Intersection codes – computer registers – computer intersections – intersections cycle

UNIT IV

Micro programmed control: Control memory – address sequencing – Design of control unit. Control processing unit: general register organization–stack organization–interruption formats
–addressing modes

UNIT V

Input - output organization: peripheral Devices – I/O interface – asynchronous data transfer – modes of transfer–priority interrupt–DMA - Memory organization: memory hierarchy–main memory–auxiliary memory–associative memory cache memory–virtual memory.

Programme Name: MSc(Computer Science and Language Technology) I year I semester

Course No: Paper 3. Object Oriented Programming with Java

Name of the Text Book:

Prescribed book:

1. E.Balaguruswamy, Programming with Java A primer 4e, TATA McGraw - Hill Company

Reference Books:

1. John R. Hubbard, Programming with Java Second Edition, Tata McGraw-Hill.
2. Jana, Java and Object Oriented Programming Paradigm, PHI.
3. Deitel& Deitel. Java: How to Program, 7th Edition, PHI.

General Objective of the Course: Understanding fundamentals of Object Oriented Programming in Java, including classes, invoking methods, Java SDK environment to create, debug and run simple java programs

Objective of UNIT I: Objective: Understanding fundamentals of OOPs, fundamentals of programming such as variables, how to run java on different platforms.

Objective of UNIT II: Objective: The main objective of this unit is to learn about decision making and branching statements in Java language.

Objective of UNIT III: Objective: Students can learn decision making and branching statements, how to create classes, objects, arrays.

Objective of UNIT IV: Objective: interface are more flexible, because a classes can implement interfaces, that can be created by students by studying this unit, packages also discussed.

Objective of UNIT V: Exception handling concepts and multithreading also discussed.

Detailed syllabus

UNIT I

Fundamentals of Object Oriented programming: Object Oriented paradigm – Basic concepts of Object Oriented Programming – Benefits of OOP – Applications of OOP.

Java Evolution: Java Features – How Java differs from C and C++ - Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software Requirements – Java Environment. Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens - Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments. Constants, Variables and Data types: Constants – Variables – Data types – Declaration of Variables - Giving Values to variables - Scope of Variables - Symbolic Constants - Type Casting.

UNIT II

Operators and Expressions: Arithmetic Operators – Relational Operators - Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Operator Precedence and Associatively.

UNIT III

Decision Making and Branching: Decision Making with If statement – Simple If Statement - If else Statement - Nesting If Else Statement - the Else If Ladder - The switch Statement – The ?: operator.

Decision Making and Looping: The while statement – The do statement – The for statement – Jumps in Loops.

Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Abstract Methods and Classes – Visibility Control.

Arrays, Strings and Vectors: One - dimensional Arrays - creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

UNIT IV

Interfaces: Multiple Inheritance: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

Packages: Java API Packages – Using system Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import.

UNIT V

Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization.

Managing Errors and Exceptions: **Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Using Exceptions for debugging.**

LAB: Object Oriented Programming with Java (100 Marks)

Programme Name: MSc(Computer Science and Language Technology) I year I semester

Course No: Paper 4. Natural Language Processing - I

Name of the Text Book:

Prescribed Textbooks:

1. NaturalLanguage Processing: Paninian Perspective.Prof. V.Chaitanya, Rajiv Sangal, published by Prentice Hallof India
2. NaturalLanguage Modeling: Prof G.U. Rao published by HCU

General Objective of the Course: The goal of natural language processing (NLP) is to design and build computer systems that are able to analyze natural languages like Sanskrit, Telugu, English, etc and that generate their outputs in a natural language, too. Typical applications of NLPare information retrieval, language understanding, and text classification.

Objective of UNIT I: Objective: Introduction to NLP. Its goals and problems.

Objective of UNIT II: Objective: The main objective of this unit is to learn what is Morphological Analyzer, core parser.

Objective of UNIT III: Objective: Students able to learn words and their analyzer.

Objective of UNIT IV: Objective: Introduction to Paninian Grammar, paninian theory and active passive can understand from this unit

Objective of UNIT V: Paninian parser and machine translation discussed.

Detailed syllabus

UNIT I

Introduction to NLP: Achievements and Brief history - Open Problems–Major Goal

UNIT II

Language Structure and Language analyzer: Introduction to Language Structure, Overview of Language analyzer: Morphological Analyzer, Local word grouping (LWG), Core Parser.

UNIT III

Words and their Analyzer: Introduction to Morphological Analysis (MA), MA using Paradigms Speeding up of MA by compilation - Local Word Grouping: Verb groups, Noun groups, Strategy for grammar Development.

UNIT IV

Paninian Grammar: Introduction to Paninian grammar – Semantic model - Paninian theory: Karaka Relations–Active Passive: Karaka to Vibhakti Mapping, Karaka shares.

UNIT V

Paninian Parser: Introduction, Core Parser: Constraints – Preferences over Parses – Lakshan charts for Sense Disambiguation – Machine Translation: Introduction, Anusaraka or Language Accessor

Programme Name: MSc(Computer Science and Language Technology) I year I semester

Course No: Paper 5. Sanskrit Linguistics - I

Name of the Text Book:

PRESCRIBED TEXTBOOK:

1.M.Sriman Narayana Murti, An Introduction to Sanskrit Linguistics by D.K.publications, Delhi

General Objective of the Course: Linguistics for Sanskrit and Modern Indian Languages. This aspect brings it closer to the goals of natural language processing

Objective of UNIT I: Objective: Introduction to Language. Theories about origin of language.

Objective of UNIT II: Objective: The main objective of this unit is to learn nature of primitive language.

Objective of UNIT III: Objective: This unit concentrates on scope of linguistics, phases of development of lingistics.

Objective of UNIT IV: Objective: Methods of classification of languages can understand from this unit

Objective of UNIT : Evolution of Classical Sanskrit and other Indian Languages discussed.

Detailed syllabus

UNIT – I

Language – its Nature, Importance, Origin and Development – Definition and nature of language – Utility of language – Theories about origin of language

UNIT – II

Nature of Primitive language - Dialects and cognate languages

UNIT – III

General Survey of Linguistics – Nature and scope of linguistics – Phases of development of linguistics – Branches of linguistics – Diachronic and Synchronic study of language

UNIT – IV

Linguistic families – Number of languages – Living and dead languages – Concept of the family of languages – Methods of classification of languages.

UNIT – V

Outlines of history of Indo-Aryan-Old Indo-Aryan-Evolution of Classical Sanskrit Differences between the Vedic and the Classical Sanskrit – Middle Indo-Aryan – Modern Indo-Aryan – Dravidian languages.

Programme Name: MSc(Computer Science and Language Technology) I year II semester

Course No: Paper 6. Operating Systems

Name of the Text Book:

Prescribed Textbook:

1. William Stallings, Operating Systems–Internals and design principles 7th Edition, Pearson Education.

General Objective of the Course: The concepts, structure and mechanism of operating system. Its purpose is to present, as clearly and completely as possible, the nature and characteristics of modern-day operating systems.

Objective of UNIT I: Describes the Key functions of an Operating System.

Objective of UNIT II: Objective: The main objective of this unit is to learn concurrency, mutual exclusion approach and semaphores.

Objective of UNIT III: This unit concentrates on deadlock and starvation.

Objective of UNIT IV: Objective: Memory Management, paging and virtual memory can understand from this unit

Objective of UNIT : I/O Management, RAID, file management discussed.

Detailed syllabus

UNIT - 1

Operating System Overview: Operating System Objectives and Functions – The Evolution of Operating Systems – Developments leading to Modern operating systems – Microsoft windows overview- Process Description and Control: Process States, Description

UNIT–II

Concurrency: Mutual Exclusion and Synchronization; Principles of Concurrency – Mutual Exclusion: Software Approach and Hardware Support - Semaphores – Monitors – Message Passing

UNIT - III

Concurrency: Deadlock and Starvation: Principles of Deadlock–Deadlock Prevention - Deadlock Avoidance–Deadlock Detection–Integrated Deadlock Strategy–Dining Philosophers Problem

UNIT–IV

Memory Management: Memory Management Requirements–Memory Partitioning–Paging – Segmentation. Virtual Memory: Hardware and Control Structures – Operating System Software –Scheduling: Types of Process Scheduling–Scheduling Algorithms.

UNIT–V

I/O Management and Disk Scheduling: Introduction –Disk Scheduling –RAID –Disk Cache–. File Management: File Organization – File Directories - Storage Management

Programme Name: MSc(Computer Science and Language Technology) I year II semester

Course No: Paper 7. Data Base Management Systems

Name of the Text Book:

Prescribed Textbook:

1. Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, 7th Edition, Thomson

Reference Books:

2. Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley.
3. Raman A Mata – Toledo/Panline K Cushman, Database Management Systems, Schaum's Outlibe series, Tata McGraw Hill
4. C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, 8th Edition, Pearson Education.

Michel Kifer, Arthur Bernstein, Philip M. Lewis, Prabin K. Pani Graphi, and Database Systems: An application oriented Approach, second edition, Pearson education.

5. Atul Kahate, Introduction to Database Management Systems, Pearson Education.

General Objective of the Course: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

Objective of UNIT I: Discuss the fundamentals of DBMS

Objective of UNIT II: Discuss the concepts of Relational DataBase Model, ER model.

Objective of UNIT III: Discuss the database design by normalization.

Objective of UNIT IV: how to write SQL queries discussed.

Objective of UNIT V: Advance SQL queries are important in database design which discussed in this unit.

Detailed syllabus

UNIT I

Database Systems: Introducing the database and DBMS, Why the database is important, Historical Roots: Files and File Systems, Problems with File System Data Management, Database Systems - Data Models: The importance of Data models, Data Model Basic Building Blocks, Business Rules, The evaluation of Data Models, Degree of Data Abstraction.

UNIT II

The Relational Database Model: A logical view of Data, Keys, Integrity Rules, Relational Set Operators, The Data Dictionary and the system catalog, Relationships within the Relational Database, Data Redundancy revisited, Indexes, Codd's relational database rules. – Entity Relation ship Model: The ER Model, Developing ER Diagram, and Database Design Challenges: Conflicting Goals. - Advanced Data Modeling: The Extended Entity Relationship Model, Entity clustering, Entity integrity: Selecting Primary keys, Design Cases: Learning Flexible Database Design.

UNIT III

Normalization of database tables: Database Tables and Normalization, The need for Normalization, The Normalization Process, Improving the design, Surrogate Key Considerations, High level Normal Forms, Normalization and database design, denormalization.

UNIT IV

Introduction to SQL: Data Definition Commands, Data Manipulation Commands, Select queries, Advanced Data Definition Commands, Advanced Select Queries, Virtual Tables, Joining Database Tables.

UNIT V

Advanced SQL: Relational Set Operators, SQL Join Operators, Sub queries and correlated queries, SQL Functions, Oracle Sequences, Updatable Views, and Procedural SQL.

Prescribed Textbook:

1.Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, 7th Edition, Thomson

Reference Books:

1.Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley.
2.Raman A Mata – Toledo/Panline K Cushman, Database Management Systems, Schaum's Outlibe series, Tata McGraw Hill
3.C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, 8th Edition, Pearson Education.
4.Michel Kifer, Arthur Bernstein, Philip M. Lewis, Prabin K. Pani Graphi, and Database Systems: An application oriented Approach, second edition, Pearson education.
5.Atul Kahate, Introduction to Database Management Systems, Pearson Education.

Lab: Data Base Management Systems (100 Marks)

Programme Name: MSc(Computer Science and Language Technology) I year II semester

Course No: Paper 8. Computer Networks

Name of the Text Book:

Prescribed Textbook:

1. Computer Networks 5th Edition by Andrew S. Tanenbaum, David J. Wetherall, Publisher: Pearson.

Reference Books:

1. S.Keshav, An Engineering approach to computer networking Addision – Wesley, International student Edition.
2. Stalling, W. Data and Computer Communication, 4th Edition, New York, Macmillan.
3. James Martin, "computer Networks and distributed Processing – Software Techniques and Architecture", PHI
4. Barly Nance, "Network Programming in C", PHI

General Objective of the Course: To provide students with an overview of the concepts and fundamentals of data communication and computer networks.

Objective of UNIT I: Discuss the fundamentals Computer Networks and Physical layer.

Objective of UNIT II: Explains Data link layer and medium access sub layer in detail.

Objective of UNIT III: Discuss about Network layer and algorithms used in this layer

Objective of UNIT IV: how transport layer supports end to end communication was discussed.

Objective of UNIT V: How Application layer works was discussed in this unit.

Detailed syllabus

UNIT–I

INTRODUTION: Uses of Computer Networks - Network Hardware: LAN, MAN, WAN– ISO OSI and TCP/IP Reference Models

PHYSICAL LAYER: Guided Transmission Media– Wireless Transmissions – Communication Satellites.

UNIT–II

DATA LINK LAYER: Design Issues - Error Detection and Correction Codes–Elementary Data Link Protocols - Sliding Window Protocols

MEDIUM ACCESS SUBLAYER - Multiple Access Protocols - Wireless LANS–Broadband Wireless–Bluetooth–Networking Devices: Repeaters, Hubs, Bridges, Switches, Routers, Gateways .

UNIT–III

NETWORK LAYER: Design Issues–Routing Algorithms–Congestion Control Algorithms

UNIT IV

TRANSPORT LAYER: Transport Layer Issues, Addressing, Connection Establishment, Connection Release, Error control and flow control, Multiplexing – TCP Protocol – UDP Protocol

UNIT - V

APPLICATION LAYER: Domain Name System – Electronic Mail- WWW

Programme Name: MSc(Computer Science and Language Technology) I year II semester

Course No: Paper 9. Natural Language Process – II (Language and Speech Processing)

Name of the Text Book:

Prescribed Textbook:

1. Speech and Language Processing–Danial Juafsky, Jamaes H. Martin.

General Objective of the Course: Students can learn how Natural language processing helps computers communicate with humans in their own language and scales other language-related tasks. For example, makes it possible for computers to read text, hear speech, interpret it, measure sentiment and determine which parts are important.

Objective of UNIT I: Discuss the fundamentals of Knowledge in speech and language processing.

Objective of UNIT II: . The major objective of this is unit is to understand automata theory which develops methods for which students can describe and analyze the dynamic behavior of discrete systems, in which signals are sampled periodically.

Objective of UNIT III: Discuss about Morphology and finate Transducers.

Objective of UNIT IV: Reference resolution and text coherence discussed.

Objective of UNIT V: How Automatic interpretation of Dialogue acts and coherence explained in this unit.

Detailed syllabus

UNIT I

Introduction to NLP: Knowledge in Speech and Language Processing–Ambiguity–Models and Algorithms – Language, Thought and Understanding – Brief History

UNIT II

Finite state automata, Using FSA to recognize sheep talk, Non - deterministic FSAs, Using an NFSA to accept strings, Relating Deterministic and Non - Deterministic Automata.

UNIT III

Morphology and Finite State Transducers: English Inflectional and Derivational Morphology, Finite state Morphological parsing, Combining FST Lexicon and Rules, Lexicon - Fee FST–Porter Stemmer, Human Morphological Processing

UNIT IV

Discourse: Reference resolution–Text Coherence - Discourse Structure–Psycholinguistic studies of Reference and coherence - Dialogue and Conversational Agents: What makes dialogue different–Dialogue Acts–

UNIT V

Automatic Interpretation of Dialogue Acts–Dialogue Structure and Coherence–Dialogue managers in conversational Agents

Lab: Natural Language Processing

Programme Name: MSc(Computer Science and Language Technology) I year II semester

Course No: Paper 10. Sanskrit Linguistics– II

Name of the Text Book:

PRESCRIBED TEXTBOOK:

1.M.Sriman Narayana Murti, An Introduction to Sanskrit Linguistics, D.K.publications, Delhi

General Objective of the Course: Linguistics for Sanskrit and Modern Indian Languages. This aspect brings it closer to the goals of natural language processing.

Objective of UNIT I: Discuss the fundamentals of Phonetics.

Objective of UNIT II: . The major objective of this is unit is to understand analysis of Sanskrit alphabets

Objective of UNIT III: Discuss about Source of Sanskrit Vowels.

Objective of UNIT IV: Phonetic law discussed.

Objective of UNIT V: Basis for Classification and sources of Sanskrit consonants explained in this unit.

Detailed syllabus

UNIT – I

Phonetics : Phonology , Phoneme, Allophone – Phonetic Tendencies in Language - Phonemes in PIE – Sanskrit Alphabet - Physiology of Language – Organs of Speech – Process of articulation of speech

UNIT – II

Analysis of Sanskrit Alphabet – Indian tradition of Phonetics – Processes – Distinction between vowel and consonant – Stops – Fricatives – Semivowels – Vowels – Nasalization of vowels and Semi Vowels – Glide – Acoustic Phonetics – Accent

UNIT – III

Sources of Sanskrit vowels : Simple vowels – Diphthongs – PIE Neutral Vowel – PIE Sonant Nasals – PIE Sonant Liquids

UNIT - IV

Phonetic law – PIE Consonants in Different Branches – Gutturals in PIE – Satam and Centum Groups of Languages

UNIT - V

Basis for Classification – Sources of Sanskrit Consonants – Palatals – Gutturals – Retroflex – Dentals – Labials – Nasals – Semivowels – Liquids – Spirants.

Programme Name: MSc(Computer Science and Language Technology) II year I semester

Course No: Paper 11. Software Engineering

Name of the Text Book:

Prescribed Textbook:

1. Software Engineering: A Practitioners Approach,6th Edition by Roger S. Pressman, Publisher: McGraw - Hill

General Objective of the Course: The basic objective of software engineering is to develop methods and procedures for software development that can scale up for large systems and that can be used consistently to produce high-quality software at low cost and with a small cycle of time.

Objective of UNIT I: Discuss the fundamentals Software Engineering and process model.

Objective of UNIT II: . The major objective of this unit is to build analysis models.

Objective of UNIT III: Discuss Design engineering concepts for SDLC.

Objective of UNIT IV: Discuss about Testing Srategies in Software Engineering.

Objective of UNIT V: Estimation of the project planning process and risk management explained in this unit.

Detailed syllabus

UNIT I

Introduction to Software Engineering: The Evolving Role of software – Software-Software Myths

A Generic View of Process: Software Engineering: A Layered Technology - A Process Framework – The Capability Maturity Model Integration (CMMI) – Process Patterns – Process Assessment – Personal and Team Process Models – Process Technology – Product and Process

Process Models: Prescriptive Models – The Waterfall Model – Incremental Process Models - Evolutionary Process Models

UNIT II

System Engineering: The Systems Engineering Hierarchy - Product Engineering: An Overview – System Modeling

Requirements Engineering: Requirements Engineering Tasks – Initiating the Requirements Engineering Process-Eliciting Requirements – Developing Use Cases – Building the Analysis Model – Negotiating Requirements – Validating Requirements

Building the Analysis Model: Requirements Analysis – Analysis Modeling Approaches – Data Modeling Concepts

UNIT III

Design Engineering: Design Concepts – The Design Model

Creating an Architectural Design: Data Design – Architectural Styles and Patterns- Architectural Design – Mapping Data Flow into a Software Architecture

Performing User Interface Design: User Interface Analysis and Design – Interface Analysis – Interface Design Steps

UNIT IV

Testing Strategies: A Strategic Approach to Software Testing – Strategic Issues – Test Strategies for Conventional Software – Validation Testing – System Testing

Testing Tactics: Software Testing Fundamentals – Black box and White box Testing – Basis Path Testing – Control Structure Testing

Product Metrics: Software Quality – A Framework for Product Metrics – Metrics for the Analysis Model – Metrics for the Design Model – Metrics for Source Code – Metrics for Testing – Metrics for Maintenance

Project Management: The Management Spectrum – The People – The Product – The Process – The Project

UNIT V

Estimation: The Project Planning Process – Software Scope and Feasibility – Resources – Software Project Estimation – Decomposition Techniques – Empirical Estimation Models – Estimation for Object-Oriented Projects- Specialized Estimation Techniques

Project Scheduling: Basic Concepts – Project Scheduling – Defining a Task Set for the Software Project – Defining a Task Network – Scheduling

Risk Management: Reactive vs Proactive Risk Strategies – Software Risks – Risk Identification – Risk Projection – Risk Refinement – Risk Mitigation, Monitoring and Management – The RMMM Plan

Programme Name: MSc(Computer Science and Language Technology) II year I semester

Course No: Paper 12. Artificial Intlligence

Name of the Text Book:

Prescribed Textbook:

1. Elain Rich, Kevin Knight, Aritificial Intelligence, Tata McGraw – Hill Publishing Company Limited

General Objective of the Course: The goal this subject is to know about how to create technology that allows computers and machines to function in an intelligent manner.

Objective of UNIT I: Discuss the fundamentals Artificial Intelligence, defining problem and design search programs.

Objective of UNIT II: The major objective of this unit is to Heuristic search techniques and knowledge representation.

Objective of UNIT III: Discuss how to use predicate logic and represent knowledge using logic programming.

Objective of UNIT IV: Discuss about symbolic reasoning under uncertainty, search techniques.

Objective of UNIT V: Explains how expert systems work using domain knowledge.

Detailed syllabus

UNIT – I

Problems and Search: what Is Artificial Intelligence? – The AI Problems- The Underlying Assumption – What Is an AI Technique? – The Level of the Model – Criteria for Success. **Problems, Problem Spaces, and Search:** Defining the Problem as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – issues in the Design of Search Programs

UNIT – II

Heuristic Search Techniques: Generate – and - Test- Hill Climbing – Best – First Search – Problem Reduction – Constraint Satisfaction – Means- Ends Analysis. **Knowledge Representation:** Representations and Mappings – Approaches to Knowledge Representation – Issues in Knowledge Representation - The Frame Problem

UNIT – III

Using Predicate Logic: Representing Simple Facts in Logic – Representing Instance and Isa Relationships – Computable functions and Predicates – Resolution – Natural Deduction. **Representing Knowledge Using Rules** – Procudural versus Declerative knowledge – Logic Programming – Forward Versus Backward Reasoning

UNIT – IV

Symbolic Reasoning under Uncertainty: Introduction to Nonmonotonic Reasoning – Logics for Non-monotonic Reasoning – Implementation Issues – Implementation: Depth-First Search – Implementation Breadth-First Search. **Weak Slot-and –Filler Structures:** Semantic Nets – Frames. Strong Slot-and-Filler Structures: Conceptual Dependency – Scripts.

UNIT - V

Expert Systems: Representing and Using Domain Knowledge – Expert System Shells – Knowledge Acquisition

Programme Name: MSc(Computer Science and Language Technology) II year I semester

Course No: Paper 13. Programming with Visual Basics

Name of the Text Book:

Prescribed Textbook:

1. Programming in Visual Basic 6.0 by Julia Case Bradley, Anita C.Millspaugh, McGraw - Hill Publishing Company Limited, New Delhi.

Reference Textbook:

1. Mastering Visual Basic by Evangelos Petroutsos : BPB Publications

General Objective of the Course: The objective of the course is to introduce GUI Programming with Visual Basic 6.0.

Objective of UNIT I: Discuss Windows applications with VB, Visual Basic Environment.

Objective of UNIT II: Introduction to controls and working with multiple controls discussed.

Objective of UNIT III: Variable, constants studied in this unit.

Objective of UNIT IV: Decision making and loop control statements are important in programming which discussed in this unit.

Objective of UNIT V: how to create menus, sub procedures and sub function can be understand by reading this unit.

Detailed syllabus

UNIT I

Introduction to Visual Basic: Writing Windows applications with Visual Basic–programming languages – procedural, object oriented, and Event Driven – The Visual Basic environment – Finding and fixing errors.

UNIT II

Controls: Introducing Controls–Working with Multiple controls–Coding for the controls.

Variables, Constants and Calculations: Data – Variables and constants – calculations – Val function–Arithmetic Operations–Formatting Data–A Calculation Programming - Counting and Accumulating sums.

UNIT III

Decisions and conditions: If Statements–conditions–Using If Statement switch Option buttons and check boxes – Displaying messages in message boxes – input validation – calling event procedures–Debugging visual basic projects.

UNIT IV

Menus, Sub Procedures and Sub Functions: Menus–Common Dialog Boxes–Writing General Procedures

Lab: Programming with Visual Basic (100 Marks)

Programme Name: MSc(Computer Science and Language Technology) II year I semester

Course No: Paper 14. Natural Language Processing - III

Name of the Text Book:

Prescribed Text Book:

1.Daniel Jurafsky, James H. Martin, Speech and Language Processing 2nd Edition, Pearson Publications, 2009

General Objective of the Course: The goal of natural language processing (NLP) is to design and build computer systems that are able to analyze natural languages like Sanskrit, Telugu, English, etc and that generate their outputs in a natural language, too. Typical applications of NLPare information retrieval, language understanding, and text classification.

Objective of UNIT I: Discuss Regular Expressions and Automata.

Objective of UNIT II: Introduction to word classes, parts-of-speech tagging and context free grammar discussed.

Objective of UNIT III: lexical semantics and word sense disambiguation and information retrieval studied in this unit.

Objective of UNIT IV: Pragmatics, dialogue and conversational agents discussed in this unit.

Objective of UNIT V: Natural Language Generation can understand by reading this unit.

Detailed syllabus

Unit – I

Words : Regular Expressions and Automata – Regular Expressions – Finite State Automata – Regular Languages and FSAs – Morphology and Finite-State Transducers**:** Survey of English Morphology – Finite-Stage Morphological Parsing – Combining FST Lexicon and Rules – Lexicon-Free FSTs – Human Morphological Processing

Unit – II

Word Classes and Part-of-Speech Tagging : English Word Classes – Tagsets for English – Part-of-Speech Tagging – Rule-Based Part-of-Speech Tagging – Stochastic Part-of-Speech Tagging – Transformation –Based Tagging – Other issues: Multiple Tags and Multiple Words – Unknown Words – Class-based N-grams.

Context-Free Grammars for English : Constituency – Context-Free Rules and Trees – Sentence-Level Constructions – The Noun Phrase – Coordination – Agreement – The verb Phrase and Sub categorization – Auxiliaries – Grammar Equivalence and Normal Form – Finite-State and Context-Free Grammars – Grammars and Human processing

Unit – III

Lexical Semantics : Relations Among Lexemes and Their Senses – WordNet – The Internal Structure of Words – Creativity and the Lexicon.

Word Sense Disambiguation and Information Retrieval : Selectional Restriction-Based Disambiguation – Robust Word Sense Disambiguation – Information Retrieval – Other Information Retrieval Tasks

Unit – IV

Pragmatics : Discurse – Regerence Resolution – Text Coherence – Discourse Structure – Psycholinguistic Studies of Reference and Coherence.

Dialogue and Conversational Agents : What Makes Dialogue Different – Dialogue Acts – Automatic Interpretation of Dialogue Acts – Dialogue Structure and Coherence – Dialogue managers in Conversational Agents.

UNIT -V

Natural Language Generation : Introduction to Language Generation – An Architecture for Generation – Surface Realization – Discourse Planning – Other Issues: Microplanning – Lexical Selection – Evaluating Generation Systems – Generating Speech

Lab: Natural Language Processing (100 Marks)

Programme Name: MSc(Computer Science and Language Technology) II year I semester

Course No: Paper 15. Sanskrit Linguistics - III

Name of the Text Book:

PRESCRIBED TEXTBOOK:
1. M.Sriman Narayana Murti, An Introduction to Sanskrit Linguistics by D.K.publications, Delhi

General Objective of the Course: Linguistics for Sanskrit and Modern Indian Languages. This Unit brings closer aspect of morphology, noun formative, compounds used in Linguistics.

Objective of UNIT I: Morphology can understand from this unit.

Objective of UNIT II: . The major objective of this is unit is to understand noun formative suffixes.

Objective of UNIT III: Discuss about compounds used in Linguistics.

Objective of UNIT IV: Verb Morphology discussed.

Objective of UNIT V: PIE verb system explained in this unit.

Detailed syllabus

UNIT – I
Morphology : Morpheme – Allomorph – Morph – Morphelogy, Suffixes : Nature of the root – Origin of suffixes – Composition theory – Secretion theory.

UNIT – II
Noun Formative Suffixes : Comparison of the division of the formative suffixes into primary and secondary with panian classification of krt and taddhita – Simple and compound suffixes – Comparative and superlative suffixes

UNIT – III
Compounds : Nature of the compound – Paninian classification of compounds – Origin of compounds – Tatpurusa – Bahuvrihi – Dvandva – Obscure compounds

UNIT – IV
Verb Morphology : Verbal root – Thematic and Athematic roots – Panini's classification of roots –

UNIT - V
PIE verb system : Person – Number – Voice – Aspect or type of verbal action – Reduplication – Augment – Personal endings – Tenses – Moods

Programme Name :MSc(Computer Science and Language Technology) II yr II semester

Course No: Paper 8. Project Work