VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Aziz Nagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.

VIDYA JYOTHI
INSTITUTE OF TECHNOLOGY
AN AUTONOMOUS INSTITUTION

COURSE SYLLABUS

M.Tech (R26)

For

M. Tech (Computer Science and Engineering)

VIDYA JYOTHI
INSTITUTE OF TECHNOLOGY
AN AUTONOMOUS INSTITUTION

[Accredited by NAAC & NBA, Approved by AICTE New Delhi & Permanently Affiliated to JNTUH]

Department of Computer Science & Engineering

MINUTES OF THE BOARD OF STUDIES (R26 - M.Tech (CSE))

Meeting held on 13th March 2026 at 2.00PM in the Board Room

The following members were present in the meeting.

S.No	Name of the Member	Designation	Signature
1.	Dr. D. Aruna Kumari, Professor & Head, CSE, VJIT	Chairman	
2.	Dr. S. Suresh Kumar, Asst.Professor in IT, JNTUH UCEJ	JNTU Nominee	
3.	Dr. V. Vijaya Kumar, Dean, CSE & IT and Director C&ACR, AU	Member	
4.	Dr. M. Nagamani, Associate Professor, School of Computer an Information Sciences, University of Hyderabad	Member	
5.	Dr. M. Rama Bai, Professor, Dept. of Emerging Technology, MGIT	Member	
6.	Dr. Kalyan Sarvepalli, Principal Consultant, Infosys.	Member	
7.	Ms. G. Srija, Software Engineer, HSBC	Member	
8.	Dr. A. Obulesh, Head, IT, VJIT	Member	
9.	Dr. KSRK Sarma, Head, CSE(DS), VJIT	Member	
10.	Dr. N. Anusha, Head, CSE(AI & ML), VJIT	Member	
11.	Dr. Ravi Mathey, Professor, CSE, VJIT	Member	
12.	Dr. Ch. Ramesh, Associate Professor, CSE, VJIT	Member	
13.	Dr. K. Rajesh Kannan, Associate Professor, CSE, VJIT	Member	
14.	Dr. B. Sailaja, Associate Professor, CSE, VJIT	Member	

Resolutions

Item No. 1	:	**Approval of M.Tech. (CSE) I and II Year Course Structure of R-26 regulations** The chairman of BoS presented a detailed course structure of M.Tech.(CSE) I and II Years under R-26 regulations.
Resolution 1	:	The members after thorough discussion approved the course structure of M.Tech.(CSE) I and II Years. The details of the course structure are given in Annexure -1 **Noted and Approved.**
Item No. 2	:	**Approval of M.Tech .(CSE) I & II Year Syllabi of R-26 regulations** The Chairman presented a detailed syllabi of M.Tech .(CSE) I & II Years
Resolution 2	:	The members after thorough discussion approved the syllabi of M.Tech . (CSE) I & II Years. The details of the syllabi approved are given in Annexure -2 **Noted and Approved.**
Item No. 3	:	**Approval of courses of M.Tech.(CSE) II Year Open Elective Courses of R-26 regulations** The chairman of BoS presented the details of Open Elective courses offered to other than CSE students.
Resolution3	:	The members after thorough discussion approved the courses of II Year Open Elective courses offered to other than CSE students.. **Noted and Approved.**
Item No.4		The BoS Chairman is also authorized to add or remove professional/substitute/Open elective courses with the approval of internal BoS members and through mail confirmation from the external BoS members.
Resolution 4	:	The BoS Members have agreed to authorize the BoS Chairman to add or remove professional/ substitute/Open elective courses with the approval of internal BoS members and through mail confirmation from the external BoS members. **Noted and Approved**
Item No.5	:	**To approve the Panel of examiners** The BoS Chairman emphasized the necessity of Panel of Examiners. Their services will be utilized in the preparation of End-Semester Question paper(s),

		Evaluation of End-Semester Examination Answer Scripts. They will be paid remuneration as per the recommendations of College Finance Committee.
Resolution 5	:	The BoS Chairman is authorized to prepare the Panel of examiners for all the M.Tech (CSE) courses in consultation with the senior faculty members of the dept. The same may be presented to the Examination branch (Autonomous) for further processing. **Noted and Approved.**

Signatures of the Members Present:

Dr. D Aruna Kumari	Dr. S. Suresh Kumar	Dr. V. Vijay Kumar	Dr. M. Nagamani
Dr. M. Rama Bai	Dr. Kalyan Sarvepalli	Ms. G. Sruti	Dr. A. Obulesh
Dr. [illegible]KK Sarma	Dr. N. Anusha	Dr. Ravi Mathey	Dr. Ch. Ramesh
Dr. K Rajesh Kannan	Dr. B. Sailaja		

M.Tech (CSE – R26)

M. TECH FIRST YEAR COURSE STRUCTURE

M. Tech I Year I Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	PC-I	Mathematical Foundations of Computer Science	3	0	0	3
2	PC-II	Advanced Data Structures	3	0	0	3
3	PE-I	Database Programming with PL/SQL Deep Learning Natural Language Processing Advanced UNIX Programming	3	0	0	3
4	PE-II	Applied Cryptography Software Quality Engineering Mining Massive Datasets Agile Methodologies	3	0	0	3
5	Lab-I	Advanced Data Structures Lab	0	0	4	2
6	Lab-II	Database Programming with PL/SQL Lab Deep Learning Lab Natural Language Processing Lab Advanced UNIX Programming Lab	0	0	4	2
7		Research Methodology & IPR	2	0	0	2
8	Audit-I	Audit Course- I	2	0	0	0
		Total	**16**	**0**	**8**	**18**

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sagarpalli	7. Ms. G. Sujia	8. Dr. A. Goutesh
9. Dr. [illegible] K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. CH. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

M. Tech I Year II Semester

Sl. No	Course Category	Course Title	L	T	P	Credits
1	PC-III	Advanced Algorithms	3	0	0	3
2	PC-IV	Advanced Computer Architecture	3	0	0	3
3	PE-III	Enterprise Cloud Concepts Cyber Security Parallel computing Large Language Models	3	0	0	3
4	PE-IV	Bioinformatics Adhoc Sensor Networks Robotic Process Automation Generative AI	3	0	0	3
5	Lab-III	Advanced Algorithms Lab	0	0	4	2
6	Lab-IV	Enterprise Cloud Concepts Lab Cyber Security Lab Parallel computing Lab Large Language Models Lab	0	0	4	2
7		Mini Project with Seminar	0	0	4	2
8	Audit-II	Audit Course- II	2	0	0	0
		Total	**14**	**0**	**12**	**18**

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Chervepalli	7. Ms. G. Srija	8. Dr. Ali Obaidat
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Baliaja		M. Tech (CSE – R26)

M. TECH SECOND YEAR COURSE STRUCTURE

M. Tech II Year I Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	PE-V	Digital Forensics Advanced Operating Systems Quantum Computing Prompt Engineering	3	0	0	3
2	OE	Open Elective	3	0	0	3
3	Dissertation	Dissertation Work Review – II	0	0	18	6
		Total	**6**	**0**	**18**	**12**

M. Tech II Year II Semester

Sl. No	Course Category	Course Title	L	T	P	Credits
1	Dissertation	Dissertation Work Review – III	0	0	18	6
2	Dissertation	Dissertation Viva-Voce	0	0	42	14
		Total	**0**	**0**	**60**	**20**

***For Dissertation Work Review - I, Please refer R25 Academic Regulations.**

Audit Course I&II:

1. English for Research Paper Writing
2. Disaster Management
3. Sanskrit for Technical Knowledge
4. Value Education
5. Constitution of India
6. Pedagogy Studies
7. Stress Management by yoga
8. Personality Development Through Life Enlightenment Skills

Open Electives for other Departments:

1. Intellectual Property Rights
2. Generative AI
3. Intrusion Detection Systems
4. Digital Forensics

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sagvepalli	7. Ms. G. Arija	8. Dr. A. Obulesh
9. Dr. R.S.R. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sujatha		**M. Tech (CSE – R26)**

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (PC-I)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand and construct precise mathematical proofs.
2. Use logic and set theory to formulate precise statements.
3. Analyze and solve counting problems on finite and discrete structures.
4. Describe and manipulate sequences.
5. Apply graph theory in solving computing problems.

UNIT-I

The Foundations Logic and Proofs: Propositional Logic, Applications of Propositional Logic, Propositional Equivalence, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Proof Methods and Strategy.

UNIT-II

Basic Structures, Sets, Functions, Sequences, Sums, Matrices and Relations: Sets, Functions, Sequences & Summations, Cardinality of Sets and Matrices Relations, Relations and Their Properties, n-ary Relations and Their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Orderings.

UNIT-III

Algorithms, Induction and Recursion: Algorithms, The Growth of Functions, Complexity of Algorithms. Induction and Recursion: Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms, Program Correctness.

UNIT-IV

Discrete Probability and Advanced Counting Techniques: An Introduction to Discrete Probability. Probability Theory, Bayes' Theorem, Expected Value and Variance. Advanced Counting Techniques.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Beevepalli	7. Ms. G. Sirja	8. Dr. A. Obulesh
9. Dr. K.V.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mateti	12. Dr.Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sudhir		**M. Tech (CSE – R26)**

Recurrence Relations, Solving Linear Recurrence Relations, Divide-and-Conquer Algorithms and Recurrence Relations, Generating Functions, Inclusion-Exclusion, Applications of Inclusion-Exclusion.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path Problems, Planar Graphs, Graph Coloring.

Trees: Introduction to Trees, Applications of Trees, Tree Traversal, Spanning Trees, Minimum Spanning Trees.

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science: J.P. Tremblay, R. Manohar, McGraw-Hill, 1st ed.
2. Discrete Mathematics for Computer Scientists & Mathematicians: Joe l. Mott, Abraham Kandel, Teodore P. Baker, Prentis Hall of India, 2nd ed.

REFERENCE BOOKS:

1. Discrete and Combinatorial Mathematics - an applied introduction: Ralph. P. Grimald, Pearson education, 5th edition.
2. Discrete Mathematical Structures: Thomas Kosy, Tata McGraw Hill Publishing co.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Sugumari
5. Dr. M. Rama Bai	6. Dr. Kalvan Sarvepalli	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. [illegible] K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

ADVANCED DATA STRUCTURES (PC-II)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of heap data structures and their properties.
2. Apply hashing techniques to construct hash tables for storing and searching data.
3. Explain balancing mechanisms in AVL Trees, Red-Black Trees, and Splay Trees.
4. Evaluate the performance of digital search trees in text processing and information retrieval systems.
5. Analyze the efficiency and complexity of different pattern matching techniques.

UNIT-I

Heap Structures: Introduction, Min-Max Heaps, Leftist trees, Binomial Heaps, Fibonacci heaps.

UNIT-II

Hashing and Collisions: Introduction, Hash Tables, Hash Functions, different Hash Functions:- Division Method, Multiplication Method, Mid-Square Method, Folding Method, Collisions

UNIT-III

Search Structures: OBST, AVL trees, Red-Black trees; Splay trees,

Multiway Search Trees: B-trees, 2-3 trees

UNIT-IV

Digital Search Structures: Digital Search trees, Binary tries and Patricia, Multiway Tries, Suffix trees, Standard Tries, Compressed Tries

UNIT-V

Pattern matching: Introduction, Brute force, the Boyer –Moore algorithm, Knuth-Morris-Pratt algorithm, Naïve String, Harspool, Rabin Karp

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Begomani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarkepalli	7. Ms. G. Sirja	8. Dr. A. Obulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Sk. Ramesh
13. Dr. K. Rajesh Kannan	14. Dr. [illegible]		**M. Tech (CSE – R26)**

TEXT BOOKS:

1. Fundamentals of data structures in C++ Sahni, Horowitz, Mehatha, Universities Press.
2. Introduction to Algorithms, TH Cormen, PHI

REFERENCE BOOKS:

1. Design methods and analysis of Algorithms, SK Basu, PHI.
2. Data Structures & Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education.
3. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, Universities Press.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. KaVeti Sarvepalli	7. Ms. G. Se[illegible]	8. Dr. A. Obulesh
9. Dr. [illegible]K Sarma	10. Dr. M. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

DATABASE PROGRAMMING WITH PL/SQL (PROFESSIONAL ELECTIVE - I)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamentals of PL/SQL programming, including variables, data types, control structures, and exception handling.
2. Develop and implement PL/SQL procedures and functions to perform database operations efficiently.
3. Design and manage PL/SQL packages to organize and reuse database program components.
4. Implement database triggers for enforcing business rules and maintaining database integrity.
5. Apply advanced PL/SQL features such as collections, cursors, and bulk operations to build efficient database applications.

UNIT-I

PL/SQL Basics

Block Structure, Behavior of Variables in Blocks, Basic Scalar and Composite Data Types, Control Structures, Exceptions, Bulk Operations, Functions, Procedures, and Packages, Transaction Scope

UNIT-II

Language Fundamentals & Control Structures

Lexical Units, Variables and Data Types, Conditional Statements, Iterative Statements, Cursor Structures, Bulk Statements, Introduction to Collections, Object Types: Varray and Table Collections, Associative Arrays, Oracle Collection API

UNIT-III

Functions and Procedures

Function and Procedure Architecture, Transaction Scope, Calling Subroutines, Positional Notation, Named Notation, Mixed Notation, Exclusionary Notation, SQL Call Notation, Functions, Function Model Choices, Creation Options, Pass-by-Value Functions, Pass-by-Reference Functions, Procedures, Pass-by-Value Procedures, Pass-by-Reference Procedures, Supporting Scripts.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Yashmani
5. Dr. M. Rama Bai	6. Dr. Kalvar Suryapali	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. K. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sanjay		**M. Tech (CSE – R26)**

UNIT-IV

Packages

Package Architecture, Package Specification, Prototype Features, Serially Reusable Precompiler Directive, Variables, Types, Components: Functions and Procedures, Package Body, Prototype Features, Variables, Types, Components: Functions and Procedures, Definer vs. Invoker Rights Mechanics, Managing Packages in the Database Catalog, Finding, Validating, and Describing Packages, Checking Dependencies, Comparing Validation Methods: Timestamp vs. Signature.

UNIT-V

Triggers

Introduction to Triggers, Database Trigger Architecture, Data Definition Language Triggers, Event Attribute Functions, Building DDL Triggers, Data Manipulation Language Triggers, Statement-Level Triggers, Row-Level Triggers, Compound Triggers, INSTEAD OF Triggers, System and Database Event Triggers, Trigger Restrictions, Maximum Trigger Size, SQL Statements, LONG and LONG RAW Data Types.

TEXT BOOKS:

1. Oracle Database 12c PL/SQL Programming Michael McLaughlin, McGraw Hill Education.

REFERENCE BOOKS:

2. Benjamin Rosenzweig, Elena Silvestrova Rakhimov, Oracle PL/SQL by example Fifth Edition.
3. Dr. P. S. Deshpande, SQL & PL / SQL for Oracle 11g Black Book.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Sirisha	8. Dr. A. Obulesu
9. Dr. K.V.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mallory	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

DEEP LEARNING (PROFESSIONAL ELECTIVE - I)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of deep learning, neural network architectures, and optimization techniques such as gradient descent and backpropagation.
2. Analyze and implement deep learning models including Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) for various learning tasks.
3. Apply deep learning techniques for solving computer vision problems such as image classification, object detection, and image captioning.
4. Utilize deep learning approaches in Natural Language Processing (NLP) including word embeddings, sentiment analysis, and sequence modeling.
5. Evaluate and design deep learning solutions using advanced models such as autoencoders, GANs, and attention mechanisms for real-world applications.

UNIT-I

Introduction: Feed forward Neural networks, Gradient descent and the back propagation algorithm, Unit saturation, the vanishing gradient problem, and ways to mitigate it. RelU Heuristics for avoiding bad local minima, Heuristics for faster training, Nestors accelerated gradient descent, Regularization, Dropout

UNIT-II

Convolutional Neural Networks: Architectures, convolution/pooling layers, Recurrent Neural Networks: LSTM, GRU, Encoder Decoder architectures. Deep Unsupervised Learning: Auto encoders, Variational Auto-encoders, Adversarial Generative Networks, Auto-encoder and DBM Attention and memory models, Dynamic Memory Models

UNIT-III

Applications of Deep Learning to Computer Vision: Image segmentation, object detection, automatic image captioning, Image generation with Generative adversarial networks, video to text with LSTM models, Attention Models for computer vision tasks.

UNIT-IV

Applications of Deep Learning to NLP: Introduction to NLP and Vector Space Model of Semantics, Word Vector Representations: Continuous Skip-Gram Model, Continuous Bag-of-Words model (CBOW), Glove, Evaluations and Applications in word similarity

UNIT-V

Analogy reasoning: Named Entity Recognition, Opinion Mining using Recurrent Neural Networks: Parsing and Sentiment Analysis using Recursive Neural Networks: Sentence Classification using Convolutional Neural Networks, Dialogue Generation with LSTMs

TEXT BOOKS:

1. Deep Learning by Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press.
2. The Elements of Statistical Learning by T. Hastie, R. Tibshirani, and J. Friedman, Springer.
3. Probabilistic Graphical Models. Koller, and N. Friedman, MIT Press.

REFERENCE BOOKS:

1. Bishop, C, M., Pattern Recognition and Machine Learning, Springer, 2006.
2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
3. Golub, G.,H., and Van Loan, C.,F., Matrix Computations, JHU Press,2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004.

Extensive Reading:

1. http://www.deeplearning.net
2. https://www.deeplearningbook.org
3. https://developers.google.com/machine-learning/crash-course/ml-intro
4. www.cs.toronto.edu/~fritz/absps/imagenet.pdf
5. http://neuralnetworksanddeeplearning.com

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V.Vijay Kumar	4. Dr. M. Nagaratna
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Sirisha	8. Dr. A. Obulesh
9. Dr. K.V.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Ramesh Kannan	14. Dr. D. Sailaja		**M. Tech (CSE – R26)**

NATURAL LANGUAGE PROCESSING (PROFESSIONAL ELECTIVE - I)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
2. Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
3. Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
4. Able to design, implement, and analyze NLP algorithms Able to design different language modeling Techniques.
5. Able to design different language modeling Techniques.

UNIT-I

Finding the Structure of Words: Words and Their Components, Issues and Challenges, Morphological Models Finding the Structure of Documents: Introduction, Methods, Complexity of the Approaches, Performances of the Approaches

UNIT-II

Syntax Analysis: Parsing Natural Language, Treebanks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms, Models for Ambiguity Resolution in Parsing, Multilingual Issues

UNIT-III

Semantic Parsing: Introduction, Semantic Interpretation, System Paradigms, Word Sense Systems, Software.

UNIT-IV

Predicate- Argument Structure, Meaning Representation Systems, Software.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Sri	8. Dr. A. Obulesu
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

UNIT-V

Discourse Processing: Cohesion, Reference Resolution, Discourse Cohesion and Structure Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems, Multilingual and Cross Lingual Language Modeling.

TEXT BOOKS:

1. Multilingual natural Language Processing Applications: From Theory to Practice – Daniel M. Bikel and Imed Zitouni, Pearson Publication.
2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary.

REFERENCE BOOKS:

1. Speech and Natural Language Processing - Daniel Jurafsky & James H Martin, Pearson Publications.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Chakravarthi	7. Mrs. M. Srija	8. Dr. A. Obulesh
9. Dr. K.V.V. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Rupesh
13. Dr. K Rajesh Kannan	14. Dr. B. Rajaiah		**M. Tech (CSE – R26)**

ADVANCED UNIX PROGRAMMING (PROFESSIONAL ELECTIVE - I)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand and use Linux/UNIX utilities and develop shell scripts to automate system tasks.
2. Apply system calls for file handling, directory management, and file system operations in UNIX environment.
3. Analyze and implement process management concepts including process creation, execution, termination, and signal handling.
4. Demonstrate Interprocess Communication (IPC) mechanisms such as pipes, message queues, semaphores, and shared memory.
5. Design and develop network applications using socket programming and client–server communication models.

UNIT-I

Linux Utilities - File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.

Shell programming with Bourne again shell (bash) - Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT-II

Files and Directories - File Concept, File types, File System Structure, file metadata-Inodes, kernel support for files, system calls for file I/O operations- open, creat, read, write, close, lseek, dup2, file status information-stat family, file and record locking- fcntl function, file permissions - chmod, fchmod, file ownership-chown, lchown, fchown, links-soft links and hard links – symlink, link, unlink. Directories - Creating, removing and changing Directories- mkdir, rmdir, chdir, obtaining current working directory getcwd, Directory contents, Scanning Directories-opendir, readdir, closedir, rewinddir functions.

UNIT-III

Process – Process concept, Layout of a C program image in main memory, Process environment environment list, environment variables, getenv, setenv, Kernel support for process, process identification, process control - process creation, replacing a process image, waiting for a process, process termination, zombie process, orphan process, system call interface for process management fork, vfork, exit, wait, waitpid, exec family, Process Groups, Sessions and Controlling Terminal, Differences between threads and processes. Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT-IV

Interprocess Communication - Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes-creation, IPC between related processes using unnamed pipes, FIFOs-creation, IPC between unrelated processes using FIFOs (Named pipes), differences between unnamed and named pipes, popen and pclose library functions. Message Queues - Kernel support for messages, APIs for message queues, client/server example. Semaphores - Kernel support for semaphores, APIs for semaphores, file locking with semaphores.

UNIT-V

Shared Memory - Kernel support for shared memory, APIs for shared memory, shared memory example.

Sockets - Introduction to Berkeley Sockets, IPC over a network, Client- Server model, Socket address structures (Unix domain and Internet domain),Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs-Single Server-Client connection, Multiple simultaneous clients, Socket options-setsockopt and fcntl system calls, Comparison of IPC mechanisms.

TEXT BOOKS:

1. Unix System Programming using C++, T. Chan, PHI.
2. Advanced Programming in the Unix Environment, 2nd edition, W. R. Stevens and S. A. Rago, Pearson Education.
3. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
4. Unix Network Programming, W. R. Stevens, PHI.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
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13. Dr. K. Santhosh Kannan	14. Dr. B. Sridhar		**M. Tech (CSE – R26)**

REFERENCE BOOKS:

1. C Programming Language, Kernighan and Ritchie, PHI.
2. Beginning Linux Programming, 4th Edition, N. Matthew, R. Stones, Wrox, Wiley India Edition.
3. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.
4. System Programming with C and Unix, A. Hoover, Pearson.
5. Unix System Programming, Communication, Concurrency and Threads, K. A. Robbins and S. Robbins, Pearson Education.
6. Unix shell Programming, S. G. Kochan and P. Wood, 3rd edition, Pearson Education.
7. Shell Scripting, S. Parker, Wiley India Pvt. Ltd.
8. Unix and Shell programming, B. A. Forouzan and R. F. Gilberg, Cengage Learning.
9. Linux System Programming, Robert Love, O'Reilly, SPD.

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APPLIED CRYPTOGRAPHY (PROFESSIONAL ELECTIVE - II)

B.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of cryptography including classical ciphers, cryptographic protocols, and security principles.
2. Analyze symmetric key cryptographic techniques and different encryption modes used in secure communication.
3. Apply public key cryptographic algorithms such as RSA, ElGamal, and Elliptic Curve Cryptography for secure data transmission.
4. Evaluate digital signature schemes, authentication mechanisms, and advanced cryptographic protocols such as secret sharing and zero-knowledge proofs.
5. Examine real-world cryptographic applications and standards such as Kerberos, PGP, PKCS, and secure electronic payment systems.

UNIT-I

Foundations: Terminology, Steganography, Substitution Ciphers and Transposition Ciphers, Simple XOR, One Time Pads, Computer Algorithms, Large Numbers, Cryptographic Protocols: Protocol Building Blocks Introduction to Protocols, Communications Using Symmetric Cryptography, One-Way Functions, One Way Hash Functions, Communications Using Public-Key Cryptography, Digital Signatures, Digital Signatures with Encryption, Random and Pseudo-Random-Sequence Generation

UNIT-II

Cryptographic Techniques Key length: Symmetric Key length, Public key length, comparing symmetric and public key length. Algorithm types and modes: Electronic Codebook Mode, Block Replay, Cipher Block Chaining Mode, Stream Cipher, Self-Synchronizing Stream Ciphers, Cipher-Feedback Mode, Synchronous Stream Ciphers, Output-Feedback Mod, Counter Mode, Other Block-Cipher Modes.

UNIT-III

Public-Key Algorithms Background, Knapsack Algorithms, RSA, Pohlig-Hellman, Rabin, ElGamal, McEliece, Elliptic Curve Cryptosystems, LUC, Finite Automaton Public-Key Cryptosystems

Public-Key Digital Signature Algorithms: Digital Signature Algorithm (DSA), DSA Variants, Gost Digital Signature Algorithm, Discrete Logarithm Signature Schemes, Ong-Schnorr-Shamir, ESIGN

UNIT-IV

Special Algorithms for Protocols Multiple-Key Public-Key Cryptography, Secret-Sharing Algorithms, Subliminal Channel, Undeniable Digital Signatures, Designated Confirmer Signatures, Computing with Encrypted Data, Fair Coin Flips, One-Way Accumulators, All-or-Nothing Disclosure of Secrets, Fair and Failsafe Cryptosystems, Zero Knowledge Proofs of Knowledge, Blind Signatures, Oblivious Transfer, Secure Multiparty Computation, Probabilistic Encryption, Quantum Cryptography

UNIT-V

Real World Approaches IBM Secret key management protocol, ISDN, Kerberos, KryptoKnight, Privacy enhanced mail (PEM), Message security protocol (MSP), PGP, Public-Key Cryptography Standards (PKCS), Universal Electronic Payment System (UEPS).

TEXT BOOKS:

1. Bruce Schneier, Applied Cryptography, Second Edition: Protocols, Algorithms, and Source Code in C (cloth).

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SOFTWARE QUALITY ENGINEERING (PROFESSIONAL ELECTIVE - II)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of software quality, quality frameworks, and software quality measurement techniques.
2. Analyze defect prevention, defect detection, and defect reduction techniques used in software quality assurance.
3. Apply quality engineering principles including quality planning, quality assessment, and continuous quality improvement in software processes.
4. Evaluate software testing activities such as test planning, execution, result analysis, and test management including automation techniques.
5. Assess software reliability using coverage-based testing and usage-based statistical testing methods for improving software quality.

UNIT-I

Software Quality

Quality: perspectives and expectations, Quality frameworks and ISO-9126, correctness and defects: Definitions, properties and Measurements, A historical perspective of quality, software quality.

UNIT-II

Quality Assurance

Classification: QA as dealing with defects, Defect prevention- Education and training, Formal method, Other defect prevention techniques, Defect Reduction - Inspection: Direct fault detection and removal, Testing: Failure observation and fault removal, other techniques and risk identification, Defect Containment- software fault tolerance, safety assurance and failure containment

UNIT-III

Quality Engineering Quality Engineering: Activities and process, Quality planning: Goal setting and Strategy formation, Quality assessment and Improvement, Quality engineering in software process.

1.Dr/ D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Mr. J. Srija	8. Dr. A. Ghulam
9. Dr. K.V.V. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
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UNIT-IV

Test Activities, Management and Automation

Test planning and preparation, Test execution, Result checking and measurement, Analysis and follow- up, Activities People and Management, Test Automation.

UNIT-V

Coverage and usage testing based on checklist and partitions

Checklist based testing and its limitations, Testing for partition Coverage, Usage based Statistical testing with Musa's operational profiles, Constructing operational profiles

Case Study: OP for the cartridge Support Software

TEXT BOOKS:

1. Jeff Tian, Software Quality Engineering, Testing, Quality Assurance, and Quantifiable improvement
2. Richard N. Taylor, Software Architecture: Foundations, Theory, and Practice

REFERENCE BOOKS:

1. Design and Analysis of algorithms, Aho, Ullman, and Hopcroft, Pearson education.
2. Introduction to Algorithms, second edition, T. H. Cormen, C.E. Leiserson, R. L. Rivest, and C.Stein, PHI Pvt. Ltd./ Pearson Education.
3. Algorithm Design: Foundations, Analysis and Internet Examples, M.T. Goodrich and R. Tamassia, John Wiley and Sons.

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MINING MASSIVE DATASETS (PROFESSIONAL ELECTIVE - II)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Handle massive data using MapReduce.
2. Develop and implement algorithms for massive data sets and methodologies in the context of data mining.
3. Understand the algorithms for extracting models and information from large datasets
4. Develop recommendation systems.
5. Gain experience in matching various algorithms for particular classes of problems.

UNIT-I

Data Mining-Introduction-Definition of Data Mining-Statistical Limits on Data Mining, MapReduce and the New Software Stack-Distributed File Systems, MapReduce, Algorithms Using MapReduce.

UNIT-II

Similarity Search: Finding Similar Items-Applications of Near-Neighbor Search, Shingling of Documents, Similarity-Preserving Summaries of Sets, Distance Measures. Streaming Data: Mining Data Streams-The Stream Data Model , Sampling Data in a Stream, Filtering Streams.

UNIT-III

Link Analysis-PageRank, Efficient Computation of PageRank, Link Spam Frequent Itemsets-Handling Larger Datasets in Main Memory, Limited-Pass Algorithms, Counting Frequent Items in a Stream. Clustering-The CURE Algorithm, Clustering in Non-Euclidean Spaces, Clustering for Streams and Parallelism

UNIT-IV

Advertising on the Web-Issues in On-Line Advertising, On-Line Algorithms, The Matching Problem, The Adwords Problem, Adwords Implementation. Recommendation Systems-A

Model for Recommendation Systems, Content-Based Recommendations, Collaborative Filtering, Dimensionality Reduction, The NetFlix Challenge.

UNIT-V

Mining Social-Network Graphs-Social Networks as Graphs, Clustering of Social-Network Graphs, Partitioning of Graphs, Simrank, Counting Triangles

TEXT BOOKS:

1. Jure Leskovec, Anand Rajaraman, Jeff Ullman, Mining of Massive Datasets, 3rd Edition.

REFERENCE BOOKS:

1. Jiawei Han & Micheline Kamber , Data Mining – Concepts and Techniques 3rd Edition Elsevier.
2. Margaret H Dunham, Data Mining Introductory and Advanced topics, PEA.
3. Ian H. Witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, Morgan Kaufmann.

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AGILE METHODOLOGIES (PROFESSIONAL ELECTIVE - II)

M.Tech I Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the principles, values, and practices of Agile development and Extreme Programming (XP).
2. Analyze collaboration practices in Agile projects including customer involvement, communication, and team coordination.
3. Apply Agile releasing practices such as version control, continuous integration, and collective ownership in software development.
4. Plan Agile projects using techniques such as release planning, iteration planning, risk management, and effort estimation.
5. Implement Agile development practices including test-driven development, refactoring, incremental design, and performance optimization.

UNIT-I

Introduction Extreme Programming (XP) - Agile Development Why Agile - Understanding Success, Beyond Deadlines, Importance of Organizational Success, Introduction to Agility How to Be Agile - Agile methods, Don't make your own method, Road to mastery Understanding XP (Extreme Programming) - XP life cycle, XP team, XP Concepts Adopting XP - Knowing whether XP is suitable, Implementing XP, assessing Agility Practicing XP - Thinking - Pair Programming, Energized work, Informative Workspace, Root cause Analysis, Retrospectives

UNIT-II

Collaborating Trust, Sit together, Real customer involvement, Ubiquitous language, meetings, coding standards, Iteration demo, Reporting

UNIT-III

Releasing Bugfree Release, Version Control, fast build, continuous Integration, Collective ownership, Documentation

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9. Dr. [illegible] K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
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UNIT-IV

Planning Version, Release Plan, Risk Management, Iteration Planning, Slack, Stories, Estimating

UNIT-V

Developing: Incremental requirements, Customer tests, Test driven development, Refactoring, Incremental design and architecture, spike solutions, Performance optimization, Exploratory testing

TEXT BOOKS:

1. The art of Agile Development, James Shore and Shane Warden, 11th Indian Reprint, O'Reilly,2018.

REFERENCE BOOKS:

1. Learning Agile, Andrew Stellman and Jennifer Greene, O'Reilly, 4th Indian Reprint, 2018.
2. Practices of an Agile Developer, Venkat Subramaniam and Andy Hunt, SPD, 5th Indian Reprint, 2015.
3. Agile Project Management - Jim Highsmith, Pearson Low price Edition 2004.

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ADVANCED DATA STRUCTURES LAB (LAB - I)

M.Tech I Year I Semester

Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Implement abstract data types and basic data structures such as stacks, queues, and trees using programming languages.
2. Apply various sorting algorithms such as Merge Sort, Heap Sort, and Quick Sort to solve computational problems.
3. Design and implement efficient tree-based data structures including Binary Search Trees, AVL Trees, and Red-Black Trees.
4. Develop programs using advanced data structures such as B-Trees, Heaps, and Leftist Trees for efficient data storage and retrieval.
5. Analyze and implement advanced data structures such as Binomial Heaps and other tree structures to improve performance of data operations.

List of Experiments:

1. Write a program to perform the following operations:
   a) Insert an element into a binary search tree.
   b) Delete an element from a binary search tree.
   c) Search for a key element in a binary search tree.
2. Write a program for implementing the following sorting methods:
   a) Merge sort
   b) Heap sort
   c) Quick sort
3. Write a program to perform the following operations:
   a) Insert an element into a B- tree.
   b) Delete an element from a B- tree.
   c) Search for a key element in a B- tree.
4. Write a program to perform the following operations:
   a) Insert an element into a Min-Max heap
   b) Delete an element from a Min-Max heap
   c) Search for a key element in a Min-Max heap
5. Write a program to perform the following operations:
   a) Insert an element into a Leftist tree

b) Delete an element from a Leftist tree
c) Search for a key element in a Leftist tree

6. Write a program to perform the following operations:
   a) Insert an element into a binomial heap
   b) Delete an element from a binomial heap.
   c) Search for a key element in a binomial heap
7. Write a program to perform the following operations:
   a) Insert an element into a AVL tree.
   b) Delete an element from a AVL search tree.
   c) Search for a key element in a AVL search tree.
8. Write a program to perform the following operations:
   a) Insert an element into a Red-Black tree.
   b) Delete an element from a Red-Black tree.
   c) Search for a key element in a Red-Black tree.
9. Write a program to implement all the functions of a dictionary using hashing.
10. Write a program for implementing Knuth-Morris-Pratt pattern matching algorithm.
11. Write a program for implementing Brute Force pattern matching algorithm
12. Write a program for implementing Boyer pattern matching algorithm.

TEXTBOOKS:

1. Fundamentals of Data structures in C, E. Horowitz, S. Sahni and Susan Anderson Freed, 2nd Edition, Universities Press
2. Data Structures Using C – A.S. Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson education.
3. Introduction to Data Structures in C, Ashok Kamthane, 1st Edition, Pearson.

SUGGESTED READING:

1. Ethan Brown, "Web Development with Node and Express", O'Reilly Publishers, First Edition, 2014.

REFERENCE BOOKS:

1. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education
2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
3. Data structures: A Pseudocode Approach with C, R.F. Gilberg And B.A. Forouzan, 2nd Edition, Cengage Learning

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DATABASE PROGRAMMING WITH PL/SQL LAB (LAB - II)

M.Tech I Year I Semester

Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Understand and apply fundamental SQL and PL/SQL concepts for database programming.
2. Develop PL/SQL programs using control structures, loops, and exception handling for database operations.
3. Implement cursors, functions, and stored procedures to process and manage database records.
4. Design and implement packages in PL/SQL to organize and manage database program units.
5. Create and use database triggers to enforce data integrity and automate database operations.

LIST OF EXPERIMENTS:

1. Write a PI/SQL program using FOR loop to insert ten rows into a database table.
2. Given the table EMPLOYEE (EmpNo, Name, Salary, Designation, DeptID), write a cursor to select the five highest paid employees from the table.
3. Illustrate how you can embed PL/SQL in a high-level host language such as C/Java And demonstrates how a banking debit transaction might be done.
4. Given an integer I, write a PL/SQL procedure to insert the tuple (i, 'xxx') into a given relation.
5. Write a PL/SQL program to demonstrate Exceptions.
6. Write a PL/SQL program to demonstrate Cursors.
7. Write a PL/SQL program to demonstrate Functions.
8. Write a PL/SQL program to demonstrate Packages.
9. Write PL/SQL queries to create Procedures.
10. Write PL/SQL queries to create Triggers..

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DEEP LEARNING LAB (LAB - II)

M.Tech I Year I Semester
Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Develop and execute Python programs using deep learning libraries such as TensorFlow, Keras, and PyTorch.
2. Implement Convolutional Neural Network (CNN) models for solving computer vision problems such as image classification.
3. Apply Recurrent Neural Networks (RNN), LSTM, and GRU models for natural language processing tasks such as sentiment analysis.
4. Implement Autoencoders and Generative Adversarial Networks (GANs) for data representation and image generation tasks.
5. Design and evaluate deep learning models to solve real-world machine learning problems in different application domains.

LIST OF EXPERIMENTS:

1. Setting up the Spyder IDE Environment and Executing a Python Program
2. Installing Keras, Tensorflow and Pytorch libraries and making use of them
3. Applying the Convolution Neural Network on computer vision problems
4. Image classification on MNIST dataset (CNN model with Fully connected layer)
5. Applying the Deep Learning Models in the field of Natural Language Processing
6. Train a sentiment analysis model on IMDB dataset, use RNN layers with LSTM/GRU notes
7. Applying the Autoencoder algorithms for encoding the real-world data
8. Applying Generative Adversial Networks for image generation and unsupervised tasks.

TEXT BOOKS:

1. Deep Learning by Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press.
2. The Elements of Statistical Learning by T. Hastie, R. Tibshirani, and J. Friedman, Springer.
3. Probabilistic Graphical Models. Koller, and N. Friedman, MIT Press..

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Rajmani
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13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

REFERENCE BOOKS:

1. Bishop, C, M., Pattern Recognition and Machine Learning, Springer, 2006.
2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
3. Golub, G.,H., and Van Loan, C.,F., Matrix Computations, JHU Press,2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004.

Extensive Reading:

1. http://www.deeplearning.net
2. https://www.deeplearningbook.org/
3. https://developers.google.com/machine-learning/crash-course/ml-intro
4. www.cs.toronto.edu/~fritz/absps/imagenet.pdf
5. http://neuralnetworksanddeeplearning.com/

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NATURAL LANGUAGE PROCESSING LAB (LAB - II)

M.Tech I Year I Semester

Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Implement fundamental NLP preprocessing techniques such as tokenization, stemming, and stop-word removal using Python.
2. Apply word analysis and word generation techniques to process and understand textual data.
3. Implement Part-of-Speech (POS) tagging, morphology, and chunking for syntactic analysis of natural language.
4. Develop statistical language models using N-grams and apply smoothing techniques for better language prediction.
5. Design and analyze NLP programs using Python to process and extract meaningful information from textual data.

LIST OF EXPERIMENTS:

Implement the following using Python

1. Tokenization
2. Stemming
3. Stop word removal (a, the, are,.)
4. Word Analysis
5. Word Generation
6. Pos tagging
7. Morphology
8. Chunking
9. N-Grams
10. N-Grams Smoothing

TEXT BOOKS

1. Multilingual natural Language Processing Applications: From Theory to Practice – Daniel M. Bikel and Imed Zitouni, Pearson Publication
2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Segumann
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Mr. P. Srija	8. Dr. A. Obulesh
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13. Dr. K. Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

REFERENCE BOOKS:

1. Speech and Natural Language Processing - Daniel Jurafsky & James H Martin, Pearson Publications

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ADVANCED UNIX PROGRAMMING LAB (LAB - II)

M.Tech I Year I Semester

Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Demonstrate the use of basic Linux utilities and develop shell scripts using pipes, redirection, and command-line tools to automate system tasks.
2. Develop shell programs using control structures, variables, arithmetic operations, and functions to solve simple computational and file-processing problems.
3. Implement C programs to perform file and directory operations using Linux system calls and understand file metadata and permissions.
4. Design and implement programs for process management and signal handling using system calls such as fork(), exec(), wait(), and signal-related functions.
5. Develop interprocess communication (IPC) applications using mechanisms such as pipes or sockets to build simple client–server communication programs.

List of Experiments:

1. Implement a shell script to demonstrate basic Linux utilities such as file handling commands (ls, cp, mv, rm), disk utilities (df, du), and networking commands (ping, ifconfig/ip).
2. Implement a shell script to demonstrate pipes and redirection, including input (<), output (>), append (>>), and pipelines (|) using common Linux commands.
3. Develop a shell script using control structures (if, case, for, while, until) to perform tasks such as checking whether a file exists and counting lines, words, and characters in a file.
4. Implement a shell script to demonstrate shell variables, command substitution, arithmetic operations, and functions (e.g., simple calculator using functions).
5. Implement a C program to demonstrate file operations using system calls: open(), creat(), read(), implement(), close(), and lseek().
6. Implement a C program to display file status information using the stat() family of functions and demonstrate changing file permissions using chmod().

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nageswara
5. Dr. M. Rama Bai	6. Dr. Kalyan Sahepalli	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. MSRK Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

7. Implement a C program to create and manipulate directories, including creating a directory, listing its contents using opendir() and readdir(), and deleting it.
8. Implement a C program to demonstrate process creation and control using fork(), exec(), wait(), and exit() system calls.
9. Implement a C program to demonstrate signal handling, including sending and catching signals using functions such as signal(), kill(), and alarm().
10. Implement C programs to demonstrate Interprocess Communication (IPC) using pipes or sockets by Implementing a simple client–server communication program.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Ajay Kumar	4. Dr. M. Nagamani
5. Dr. M. Ratna Raj	6. Dr. Kalyan Sarvepalli	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. KS. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mallacy	12. Dr. C.H. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sankaja		**M. Tech (CSE – R26)**

RESEARCH METHODOLOGY & IPR

M.Tech I Year I Semester
Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Identify and formulate research problems and apply appropriate research methodologies to investigate them.
2. Conduct effective literature surveys and analyze research information using proper research techniques.
3. Apply research ethics and avoid plagiarism while conducting and reporting research work.
4. Prepare technical reports, research papers, and research proposals using standard scientific writing practices.
5. Understand the concepts of Intellectual Property Rights (IPR) including patents, copyrights, trademarks, and the patent filing process

UNIT-I

Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations

UNIT-II

Effective literature studies approaches, analysis, Plagiarism, Research ethics

UNIT-III

Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

UNIT-IV

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. [illegible] Vijay Kumar	4. Dr. M. Nagaraju
5. Dr. M. Rama Bai	6. Dr. KalyaneSarvepalli	7. Ms. [illegible]. Srija	8. Dr. A.Obulesh
9. Dr. K. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mahey	12. Dr. [illegible] Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sujitha		M. Tech (CSE – R26)

UNIT-V

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

TEXT BOOKS:

1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students"
2. C.R. Kothari, Research Methodology, methods & techniques, 2nd edition, New age International publishers

REFERENCE BOOKS:

1. Ranjit Kumar, 2nd Edition, "Research Methodology: A Step by Step Guide for beginners"
2. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2007.
3. Mayall, "Industrial Design", McGraw Hill, 1992.
4. Niebel, "Product Design", McGraw Hill, 1974.
5. Asimov, "Introduction to Design", Prentice Hall, 1962.
6. Robert P. Merges, Peter S. Menell, Mark A. Lemley, "Intellectual Property in New Technological Age", 2016.
7. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008.

1.Dr. D. Anand Kumar	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagmani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. P. Srija	8. Dr. A. Obulesh
9. Dr. K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. Ch. Ramesh
13. Dr. K Ramesh Kannan	14. Dr. G. Suraja		**M. Tech (CSE – R26)**

ADVANCED ALGORITHMS (PC - III)

M.Tech I Year II Semester
Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Analyze the performance and complexity of advanced algorithms used for solving computational problems.
2. Apply graph algorithms such as shortest path, topological sorting, and strongly connected components to solve network problems.
3. Design algorithms using paradigms such as greedy method, divide and conquer, and dynamic programming.
4. Implement advanced algorithmic techniques including maximum flow, graph matching, matrix computations, and FFT-based algorithms.
5. Evaluate computational complexity and classify problems using NP-completeness and linear programming concepts.

UNIT-I

Sorting: Review of various sorting algorithms, topological sorting

Graph: Definitions and Elementary Algorithms: Shortest path by BFS, shortest path in edge-weighted case (Dijkstra's), depth-first search and computation of strongly connected components, emphasis on correctness proof of the algorithm and time/space analysis, example of amortized analysis.

UNIT-II

Matroids: Introduction to greedy paradigm, algorithm to compute a maximum weight maximal independent set. Application to MST.

Graph Matching: Algorithm to compute maximum matching. Characterization of maximum matching by augmenting paths, Edmond's Blossom algorithm to compute augmenting path.

UNIT-III

Flow-Networks: Maxflow-mincut theorem, Ford-Fulkerson Method to compute maximum flow, Edmond-Karp maximum-flow algorithm.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Sreelatha
5. Dr. M. Rama Bai	6. Dr. Kalvan Saurabh	7. Ms. G. Srija	8. Dr. Ali Obulesu
9. Dr. [illegible] Sarma	10. Dr. M. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K. Rajesh Kannan	14. Dr. D. Sudha		M. Tech (CSE – R26)

Matrix Computations: Strassen's algorithm and introduction to divide and conquer paradigm, inverse of a triangular matrix, relation between the time complexities of basic matrix operations, LUP-decomposition.

UNIT-IV

Shortest Path in Graphs: Floyd-Warshall algorithm and introduction to dynamic programming paradigm. More examples of dynamic programming.

Modulo Representation of integers/polynomials: Chinese Remainder Theorem, Conversion between base-representation and modulo-representation. Extension to polynomials. Application: Interpolation problem.

Discrete Fourier Transform (DFT): In complex field, DFT in modulo ring. Fast Fourier Transform algorithm. Schonhage-Strassen Integer Multiplication algorithm.

UNIT-V

Linear Programming: Geometry of the feasibility region and Simplex algorithm

NP-completeness: Examples, proof of NP-hardness and NP-completeness. Recent Trends in problem solving paradigms using recent searching and sorting techniques by applying recently proposed data structures.

REFERENCE BOOKS:

1. Cormen, Leiserson, Rivest, Stein, "Introduction to Algorithms".
2. Aho, Hopcroft, Ullman "The Design and Analysis of Computer Algorithms".
3. Kleinberg and Tardos."Algorithm Design".

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarkepalli	7. Mr. G. Srija	8. Dr. A. Obulesu
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sudha		**M. Tech (CSE – R26)**

ADVANCED COMPUTER ARCHITECTURE (PC - IV)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of parallel computing models and advanced computer architectures.
2. Analyze performance metrics, scalability, and speedup laws used in parallel processing systems.
3. Apply pipelining and superscalar techniques to improve processor performance.
4. Evaluate shared-memory and distributed-memory architectures, including multiprocessors and multicomputers.
5. Understand vector processing and SIMD architectures and their applications in high-performance computing.

UNIT-I

Theory of Parallelism, Parallel computer models, The State of Computing, Multiprocessors and Multicomputers, Multivector and SIMD Computers, PRAM and VLSI models, Architectural development tracks, Program and network properties, Conditions of parallelism, Program partitioning and Scheduling, Program flow Mechanisms, System Interconnect Architectures.

UNIT-II

Principles of Scalable performance, Performance metrics and measures, Parallel Processing applications, Speed up performance laws, Scalability Analysis and Approaches, Hardware Technologies, Processes and Memory Hierarchy, Advanced Processor Technology, Superscalar and Vector Processors

UNIT-III

Shared-Memory Organizations, Sequential and weak consistency models, Pipelining and superscalar techniques, Linear Pipeline Processors, Non-Linear Pipeline Processors, Instruction Pipeline design, Arithmetic pipeline design, superscalar pipeline design.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Rajasekhara
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

UNIT-IV

Parallel and Scalable Architectures, Multiprocessors and Multicomputers, Multiprocessor system interconnects, cache coherence and synchronization mechanism, Three Generations of Multicomputers, Message-passing Mechanisms, Multivetor and SIMD computers.

UNIT-V

Vector Processing Principles, Multivector Multiprocessors, Compound Vector processing, SIMD computer Organizations, The connection machine CM-5.

TEXT BOOKS:

1. Advanced Computer Architecture, Kai Hwang, 2nd Edition, Tata McGraw Hill Publishers.

REFERENCE BOOKS:

1. Computer Architecture, J.L. Hennessy and D.A. Patterson, 4th Edition, ELSEVIER.
2. Advanced Computer Architectures, S.G.Shiva, Special Indian edition, CRC, Taylor &Francis.
3. Introduction to High Performance Computing for Scientists and Engineers, G. Hager and G. Wellein, CRC Press, Taylor & Francis Group.
4. Advanced Computer Architecture, D. Sima, T. Fountain, P. Kacsuk, Pearson education. 5. Computer Architecture, B. Parhami, Oxford Univ. Press.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. J. Sirija	8. Dr. A. Obulesh
9. Dr. K.V.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sudhir		**M. Tech (CSE – R26)**

ENTERPRISE CLOUD CONCEPTS (PROFESSIONAL ELECTIVE - III)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts, characteristics, and deployment models of cloud computing.
2. Analyze cloud architecture, virtualization technologies, and data center technologies used in cloud environments.
3. Evaluate cloud computing mechanisms and infrastructure components such as virtual servers, cloud storage, and resource replication.
4. Apply cloud management and architecture models including resource management, SLA management, and workload distribution.
5. Examine enterprise cloud transformations and cloud-based business strategies for building cloud-enabled smart enterprises.

UNIT-I

Understanding Cloud Computing: Origins and influences, Basic Concepts and Terminology, Goals and Benefits, Risks and Challenges.

Fundamental Concepts and Models: Roles and Boundaries, Cloud Characteristics, Cloud Delivery Models, Cloud Deployment Models.

UNIT-II

Cloud-Enabling Technology: Broadband Networks and Internet Architecture, Data Center Technology, Virtualization Technology

CLOUD COMPUTING MECHANISMS:

Cloud Infrastructure Mechanisms: Logical Network Perimeter, Virtual Server, Cloud Storage Device, Cloud Usage Monitor, Resource Replication

UNIT-III

Cloud Management Mechanisms: Remote Administration System, Resource Management System, SLA Management System, Billing Management System, Case Study Example Cloud Computing Architecture

Fundamental Cloud Architectures: Workload Distribution Architecture, Resource Pooling Architecture, Dynamic Scalability Architecture, Elastic Resource Capacity Architecture,

Service Load Balancing Architecture, Cloud Bursting Architecture, Elastic Disk Provisioning Architecture, Redundant Storage Architecture, Case Study Example

UNIT-IV

Cloud-Enabled Smart Enterprises Introduction, Revisiting the Enterprise Journey, Service-Oriented Enterprises, Cloud Enterprises, Smart Enterprises, The Enabling Mechanisms of Smart Enterprises

Cloud-Inspired Enterprise Transformations Introduction, The Cloud Scheme for Enterprise Success, Elucidating the Evolving Cloud Idea, Implications of the Cloud on Enterprise Strategy, Establishing a Cloud-Incorporated Business Strategy

UNIT-V

Transitioning to Cloud-Centric Enterprises The Tuning Methodology, Contract Management in the Cloud

Cloud-Instigated IT Transformations Introduction, Explaining Cloud Infrastructures, A Briefing on Next-Generation Services, Service Infrastructures, Cloud Infrastructures, Cloud Infrastructure Solutions, Clouds for Business Continuity, The Relevance of Private Clouds, The Emergence of Enterprise Clouds

TEXT BOOKS:

1. Erl Thomas, Puttini Ricardo, Mahmood Zaigham, Cloud Computing: Concepts, Technology & Architecture 1st Edition,
2. Pethuru Raj, Cloud Enterprise Architecture, CRC Press

REFERENCE BOOKS:

1. James Bond, The Enterprise Cloud, O'Reilly Media, Inc. R25 M.Tech CSE/CS

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. [illegible] Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sagarpalli	7. Ms. S. Sreja	8. Dr. A. Obulesh
9. Dr. K. V. K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sathija		**M. Tech (CSE – R26)**

CYBER SECURITY (PROFESSIONAL ELECTIVE - III)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of cyber security, including threats, vulnerabilities, and different types of cyber-attacks.
2. Analyze cyber security regulations, cyber laws, and digital forensics techniques used for investigating cyber crimes.
3. Evaluate security issues related to mobile and wireless devices, including authentication mechanisms and mobile security threats.
4. Examine organizational security challenges and cyber risks, including web threats, social media security, and enterprise security policies.
5. Understand data privacy concepts and privacy attacks, and analyze real-world cybercrime cases and security implications.

UNIT-I

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

UNIT-II

Cyberspace and the Law & Cyber Forensics: Introduction, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace, National Cyber Security Policy. Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics

UNIT-III

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless

Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Organizational security Policies and Measures in Mobile Computing Era, Laptops.

UNIT-IV

Cyber Security: Organizational Implications: Introduction, cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations

UNIT-V

Privacy Issues: Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domains- medical, financial, etc

Cybercrime: Examples and Mini-Cases

Examples: Official Website of Maharashtra Government Hacked, Indian Banks Lose Millions of Rupees, Parliament Attack, Pune City Police Bust Nigerian Racket, e-mail spoofing instances.

Mini-Cases: The Indian Case of online Gambling, An Indian Case of Intellectual Property Crime, Financial Frauds in Cyber Domain.

TEXT BOOKS:

1. Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley
2. B.B. Gupta, D.P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335,2018.

REFERENCE BOOKS:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&FGroup.

1. Dr. D. Arudra Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Soja	8. Dr. A. Obulesh
9. Dr. K. V. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sahaja		M. Tech (CSE – R26)

PARALLEL COMPUTING (PROFESSIONAL ELECTIVE - III)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of parallel computing architectures and programming platforms.
2. Analyze and design parallel algorithms using appropriate models and analytical performance measures.
3. Implement parallel programs using message passing (MPI) and shared memory programming (PThreads).
4. Apply parallel computing techniques to solve matrix computations and sorting problems efficiently.
5. Develop parallel solutions for graph algorithms and search algorithms and evaluate their performance.

UNIT-I

Parallel Computing: Introduction, Motivation and scope - Parallel Programming Platforms – Basic Communication Operations

UNIT-II

Principles of Parallel Algorithm Design - Analytical Modelling of Parallel Programs

UNIT-III

Programming using Message Passing Paradigm (MPI) – Programming Shared Address Space Platforms (PThreads)

UNIT-IV

Dense Matric Algorithms (Matrix-Vector Multiplication, Matrix-Matrix Multiplication) – Sorting Algorithms (Issues, Bubble Sort, Quick Sort, Bucket Sort, Enumeration Sort, Radix Sort)

UNIT-V

Graph Algorithms (Minimum Spanning Tree: Prim's Algorithm - Single-Source Shortest Paths: Dijkstra's Algorithm) Search Algorithms (DFS, BFS)

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Rajasekhara
5. Dr. M. Rama Bai	6. Dr. Kalyan Chakrapalli	7. Mrs. G. Srija	8. Dr. A. Obulesh
9. Dr. K.V.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. C. Ramesh
13. Dr. K Rajesh Kahman	14. Dr. B. Sankya		**M. Tech (CSE – R26)**

TEXT BOOKS:

1. Introduction to Parallel Computing, Second Edition, Ananth Grama, George Karypis, Vipin Kumar, Anshul Gupta, Addison-Wesley, 2003, ISBN: 0201648652

REFERENCE BOOKS:

1. Parallel Computing – Theory and Practice, Second Edition, Michaek J. Quinn, Tata McGraw Hill Edition.
2. Parallel Computers – Architectures and Programming, V. Rajaraman, C. Siva Ram Murthy, PHI.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. T. Srija	8. Dr. A. Obulesh
9. Dr. K. V. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathew	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

LARGE LANGUAGE MODELS (PROFESSIONAL ELECTIVE - III)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the architecture and inner workings of transformer-based LLMs.
2. Apply prompt engineering and fine-tuning techniques for domain-specific tasks.
3. Evaluate LLM performance using standard metrics and benchmarks.
4. Identify challenges in LLM training, deployment, and scaling.
5. Analyze ethical, legal, and societal implications of LLM usage.

UNIT-I

Foundations of Large Language Models

Introduction to LLMs: Definition, scope, and historical evolution from statistical NLP to transformers. The Transformer architecture: Attention mechanisms, self-attention, multi-head attention. Pretraining objectives: Masked language modeling (MLM), Causal language modeling (CLM). Evolution of LLMs: BERT, GPT series, T5, LLaMA, Mistral.

UNIT-II

Training and Fine-Tuning LLMs

Pretraining datasets and tokenization: BPE, SentencePiece, WordPiece. Fine-tuning approaches: Full fine-tuning, LoRA, adapters, instruction tuning. Domain adaptation and few-shot/zero-shot learning. Data augmentation for LLMs and prompt-based tuning.

UNIT-III

Prompt Engineering and Applications

Principles of prompt design: Zero-shot, few-shot, and chain-of-thought prompting. System prompts, role prompting, and context length optimization.

Use cases: Text generation, summarization, code generation, question answering, chatbots. Tools & frameworks: Lang Chain, Llama Index, Hugging Face Transformers.

UNIT-IV

Evaluation and Deployment of LLMs

Evaluation metrics: Perplexity, BLEU, ROUGE, METEOR, human evaluation.

Benchmark datasets: GLUE, SuperGLUE, HELM, BIG-bench.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Laxmaiah
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. CHKS Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sudha		**M. Tech (CSE – R26)**

Deployment strategies: API-based deployment, on-prem deployment, inference optimization. Scaling and latency considerations; quantization and pruning for LLMs.

UNIT-V

Ethics, Safety, and Future Directions Bias, fairness, and toxicity in LLMs. Hallucination problem and mitigation techniques. Legal and regulatory issues: Copyright, data privacy, AI Act. Trends in LLM research: Multimodal LLMs, retrieval-augmented generation (RAG), open-source LLM ecosystems.

TEXT BOOKS:

1. Vaswani, A. et al. (2017) Attention Is All You Need – NIPS Conference Paper.
2. Lewis, P. et al. (2021) Language Models are Few-Shot Learners – OpenAI Research Paper.
3. Tunstall, L., von Werra, L., & Wolf, T. (2022) Natural Language Processing with Transformers – O'Reilly Media.

REFERENCE BOOKS:

1. Bommasani, R. et al. (2021) On the Opportunities and Risks of Foundation Models – Stanford CRFM.
2. Jurafsky, D., & Martin, J. H. (2023) Speech and Language Processing (3rd Edition draft) – Pearson.
3. Mollick, E., & Mollick, L. (2024) Co-Intelligence: Living and Working with AI – Little, Brown Spark.
4. Hugging Face Documentation – https://huggingface.co/docs/

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. [illegible] Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. A. Srija	8. Dr. A. Goulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

BIOINFORMATICS (PROFESSIONAL ELECTIVE - IV)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of bioinformatics, including the central dogma of molecular biology and BioXML.
2. Apply Perl/BioPerl programming techniques to analyze and manipulate biological sequence data.
3. Analyze bioinformatics databases and database management technologies used for storing and retrieving biological information.
4. Implement sequence alignment algorithms and apply computational techniques for biological sequence analysis.
5. Perform phylogenetic analysis and clustering techniques to study evolutionary relationships and biological data patterns.

UNIT-I

The Central Dogma & XML (Bio XML) for Bioinformatics: Watson's definition, information flow, from data to knowledge, Convergence, the organization of DNA, the organization of Proteins, Introduction, Differences between HTML and XML, fundamentals of XML, fundamentals of XML namespoces. Introduction to DTDs, Document type Declarations, Declaring elements, declaring attributes, working with entities XML Schemas, Essential Concepts, working with simple types, working with complex types, Basic namespaces issues.

UNIT-II

Perl (Bioperl) for Bioinformatics: Representing sequence data, program to store a DNA sequence, concatenating DNA fragments, Transcription, Calculating the reverse complement in Perl, Proteins, files, reading proteins in files, Arrays, Flow control, finding motifs, counting Nucleotides, exploding strings into arrays, operating on strings, writing to files, subroutines and bugs.

UNIT-III

Databases: Flat file, Relational, object oriented databases, object Relational and Hypertext, Data life cycle, Database Technology, Database Architecture, Database Management Systems and Interfaces.

UNIT-IV

Sequence Alignment Algorithms: Biological motivations of sequence analysis, the models for sequence analysis and their biological motivation, global alignment, local alignment, End free-space alignment and gap penalty, Sequence Analysis tools and techniques.

UNIT-V

Phylogenetic Analysis: Introduction, methods of Phylogenetic analysis, distance methods, the neighbor- Joining (NJ) method, The Fitch/ Margoliash method, character-based methods, Other methods, Tree evaluation and problems in phylogenetic analysis, Clustering, Protein structure visualization and Protein structure prediction.

TEXT BOOKS:

1. S.C. Rastogi, N. Mendiratta, "Bioinformatics Methods and Applications", CBS publications, 2004
2. James D. Tisdall, "Beginning Perl for Bioinformatics" O'Reilly media, 1st Edition, 2001

REFERENCE BOOKS:

1. D.R. Westhead, J.H. Parish, "Bioinformatics" Viva books private limited, New Delhi (2003)
2. Att Wood, "Bioinfarmatics" Pearson Education, 2004
3. Bryan Bergeron, M.D, "Bioinformatics Computing" Pearson Education, 2003

1. Dr. D. Arumugam	2. Dr. S. Suresh Kumar	3. Dr. V. [illegible]	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Vidyasagar Sarvepalli	7. Ms. G. Erija	8. Dr. A. Obulesu
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mather	12. Dr. Ch. Ramesh
13. Dr. K Ramesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

AD-HOC AND SENSOR NETWORKS (PROFESSIONAL ELECTIVE - IV)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts, characteristics, and applications of Ad-hoc Networks and Wireless Sensor Networks (WSN).
2. Analyze and compare various routing protocols used in Mobile Ad-hoc Networks (MANETs).
3. Evaluate broadcasting, multicasting, and geocasting techniques used for data transmission in ad-hoc networks.
4. Understand the architecture and lower layer issues of wireless sensor networks, including physical, MAC, link, and routing layers.
5. Analyze transport and application layer issues in WSNs and apply suitable protocols for efficient communication

UNIT-I

Introduction to Ad Hoc Networks

Characteristics of MANETs, Applications of MANETs and Challenges of MANETs. Routing in MANETs Criteria for classification, Taxonomy of MANET routing algorithms, Topology-based routing algorithms-Proactive: DSDV, WRP; Reactive: DSR, AODV, TORA; Hybrid: ZRP; Position- based routing algorithms-Location Services-DREAM, Quorum-based, GLS; Forwarding Strategies Greedy Packet, Restricted Directional Flooding-DREAM, LAR; Other routing algorithms-QoS Routing, CEDAR.

UNIT-II

Data Transmission

Broadcast Storm Problem, Rebroadcasting Schemes-Simple-flooding, Probability-based Methods, Area-based Methods, Neighbour Knowledge-based: SBA, Multipoint Relaying, AHBP. Multicasting: Tree-based: AMRIS, MAODV; Mesh-based: ODMRP, CAMP; Hybrid: AMRoute, MCEDAR.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. [illegible]	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Vinija	8. Dr. A. Obulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathew	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

UNIT-III

Geocasting Data-transmission Oriented-LBM; Route Creation Oriented-GeoTORA, MGR. TCP over Ad Hoc TCP protocol overview, TCP and MANETs, Solutions for TCP over Ad hoc

UNIT-IV

Basics of Wireless Sensors and Lower Layer Issues

Applications, Classification of sensor networks, Architecture of sensor network, Physical layer, MAC layer, Link layer, Routing Layer.

UNIT-V

Upper Layer Issues of WSN Transport layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs.

TEXT BOOKS:

1. Ad Hoc and Sensor Networks – Theory and Applications, Carlos Corderio Dharma P.Aggarwal, World Scientific Publications, March 2006, ISBN – 981-256-681-3
2. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Gulbas, Elsevier Science, ISBN – 978-1-55860-914-3 (Morgan Kauffman)

REFERENCE BOOKS:

1. C. Siva Ram Murthy, B.S. ManojAd Hoc Wireless Networks: Architectures and Protocols
2. Taieb Znati Kazem Sohraby, Daniel Minoli, Wireless Sensor Networks: Technology, Protocols and Applications, Wiley.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Laxmaiah
5. Dr. M. Rama Bai	6. Dr. Kalyan Sadhepalli	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. [illegible] K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sarada		**M. Tech (CSE – R26)**

ROBOTIC PROCESS AUTOMATION (PROFESSIONAL ELECTIVE - IV)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts, architecture, and applications of Robotic Process Automation (RPA) in business process automation.
2. Analyze the components of RPA platforms, including Web Control Room, client tools, and workload management.
3. Develop automation bots using bot creators, recorders, and task editors for automating repetitive tasks.
4. Implement automation workflows using commands for Excel, databases, strings, XML, and loops in RPA tools.
5. Apply advanced RPA features such as error handling, object cloning, API integration, and workflow/report design for enterprise automation.

UNIT-I

Introduction to Robotic Process Automation & Bot Creation Introduction to RPA and Use cases – Automation Anywhere Enterprise Pla
tform – Advanced features and capabilities – Ways to create Bots

UNIT-II

Web Control Room and Client Introduction - Features Panel - Dashboard (Home, Bots, Devices, Audit, Workload, Insights) - Features Panel – Activity (View Tasks in Progress and Scheduled Tasks) - Bots (View Bots Uploade

UNIT-III

Devices (View Development and Runtime Clients and Device Pools) - Workload (Queues and SLA Calculator) - Audit Log (View Activities Logged which are associated with Web CR) - Administration (Configure Settings, Users, Roles, License and Migration) - Demo of Exposed API's – Conclusion – Client introduction and Conclusion.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Keerthi Srivapalli	7. Ms. G. Raja	8. Dr. A. Obulesh
9. Dr. G.V.K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

UNIT-IV

Bot Creator Introduction – Recorders – Smart Recorders – Web Recorders – Screen Recorders - Task Editor – Variables - Command Library – Loop Command – Excel Command – Database Command - String Operation Command - XML Command

UNIT-V

Terminal Emulator Command - PDF Integration Command - FTP Command - PGP Command - Object Cloning Command - Error Handling Command - Manage Windows Control Command - Workflow Designer - Report Designer

TEXT BOOKS:

1. Learning Robotic Process Automation: Create Software robots and automate business processes with the leading RPA tool - UiPath: Create Software robots. with the leading RPA tool – UiPath Kindle Edition.

REFERENCE BOOKS:

1. Robotic Process Automation A Complete Guide - 2020 Edition Kindle Edition.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. [illegible]	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. [illegible]	8. Dr. A. Soudeep
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

GENERATIVE AI (PROFESSIONAL ELECTIVE - IV)

M.Tech I Year II Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of Artificial Intelligence, Machine Learning, Deep Learning, and Generative AI models.
2. Analyze advanced neural architectures such as GANs, Variational Autoencoders (VAEs), Transformers, and Large Language Models (LLMs).
3. Apply prompt engineering techniques and fine-tuning methods to develop effective generative AI applications.
4. Design and implement multi-agent systems and generative AI applications using modern frameworks and tools.
5. Evaluate multimodal generative AI systems and ethical considerations in deploying AI solutions across real-world domains.

UNIT-I

Foundations of AI and Generative Models Introduction and historical evolution to Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP)and Deep Learning (DL), Structure of Artificial Neural Networks (ANNs), Mathematical and computational foundations of generative modeling, Overview of generative models and their applications across various domains; Importance of Generative AI in modern applications, Transfer learning and in advancing Generative AI

UNIT-II

Advanced Neural Architectures for Generative AI Variational Autoencoders (VAEs): principles and applications, Generative Adversarial Networks (GANs): architecture and working principles; Transformer architecture and attention mechanisms (in detail); Long Short-Term Memory Networks (LSTMs) and the limitations of traditional RNNs/LSTMs, Advanced Transformer architectures and techniques, Pre-training and transfer learning strategies for generative models

UNIT-III

Large Language Models and Prompt Engineering Overview of Large Language Models (LLMs), GPT architecture, variants, and working principles, Pré training and fine-tuning

GPT models for applications (e.g., chatbots, text generation), Case study: GPT-based customer support chatbot, BERT architecture, pre-training objectives, and fine-tuning, Prompt Engineering: Designing effective prompts, controlling model behavior, and improving output quality, Fine-tuning language models for creative writing and chatbot development

UNIT-IV

Multi-Agent Systems and Generative AI Applications Introduction to Multi-Agent Systems (MAS),Types of agents: reactive, deliberative, hybrid, and learning agents, Multi-agent collaboration and orchestration for generative tasks, Use cases: autonomous research assistants, cooperative creative generation, distributed problem-solving, Frameworks and tools: AutoGen, CrewAI, Hugging GPT for LLM-powered multi-agent systems, Generative AI applications: Art, Creativity, Image/Video generation, Music composition, Healthcare, Finance, Real-world case studies and deployment challenges

UNIT-V

Frameworks, Multimodal Applications, and Ethics LangChain framework: components and LLM application development, Retrieval-Augmented Generation (RAG), Embeddings, Indexing networks, and Vector databases, Generative AI across modalities: Text, Code, Image, and Video generation, Image and Video generation using GANs and VAEs, Multimodal Generative AI: integration and training strategies, Ethical considerations: bias, fairness, trust, and responsible AI deployment, Social and legal implications of Generative AI, Risk mitigation strategies and real-world ethical case studies

TEXT BOOKS

1. Altaf Rehmani, Generative AI for Everyone: Understanding the Essentials and Applications of This Breakthrough Technology.
2. Charu C. Aggarwal, Neural Networks and Deep Learning: A Textbook. Joseph Babcock, Raghav Bali, Generative AI with Python and TensorFlow 2, 2024.

REFERENCE BOOKS

1. Josh Kalin, Generative Adversarial Networks Cookbook.
2. Jesse Sprinter, Generative AI in Software Development: Beyond the Limitations of Traditional Coding, 2024.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Ruvan Satyapalli	7. Ms. [illegible]	8. Dr. A. Obulesh
9. Dr. K. V. K. Sarma	10. Dr. M. Anusha	11. Dr. Ravi Mathur	12. Dr. Ch. Ramesh
13. Dr. K. Rajesh Kannan	14. Dr. R. Sahaja		**M. Tech (CSE – R26)**

ONLINE REFERENCES

1. Fabian Gloeckle et al., Better & Faster Large Language Models via Multi-token Prediction, arXiv:2404.19737v1, 2024.Vaswani et al., Attention Is All You Need, NeurIPS 2017.

1.Dr. D. Anuradha Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Rajamani
5. Dr. M. Rama Bai	6. Dr. Kalyani Kadarla	7. Ms. M. Sirija	8. Dr. A. Obulesu
9. Dr. [illegible] K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

ADVANCED ALGORITHMS LAB (LAB - III)

M.Tech I Year II Semester

Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Implement and analyze algorithms using different design techniques such as brute force, divide and conquer, and greedy methods.
2. Apply advanced algorithmic techniques to solve problems such as knapsack, assignment problem, and maximum flow.
3. Implement matrix and graph algorithms including Gaussian elimination, LU decomposition, and Warshall's algorithm.
4. Develop and analyze string matching algorithms such as Rabin-Karp, KMP, and Horspool algorithms.
5. Evaluate the performance and efficiency of advanced algorithms through practical implementation and testing.

List of Experiments

1. Implement assignment problem using Brute Force method
2. Perform multiplication of long integers using divide and conquer method.
3. Implement a solution for the knapsack problem using the Greedy method.
4. Implement Gaussian elimination method.
5. Implement LU decomposition
6. Implement Warshall algorithm
7. Implement the Rabin Karp algorithm.
8. Implement the KMP algorithm.
9. Implement Horspool algorithm
10. Implement max-flow problem.

TEXT BOOK:

1. Design and Analysis of Algorithms, S.Sridhar, OXFORD University Press

REFERENCE BOOKS:

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest and C.Stein,PHI Pvt. Ltd./ Pearson Education.

1. Dr. D. Anuradha Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Sree	8. Dr. A. Obulesh
9. Dr. [illegible] K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. S. Sasikala		M. Tech (CSE – R26)

2. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Universities Press.
3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Ranbir Bai	6. Dr. Kalyan Sarvepalli	7. Ms. [illegible]	8. Dr. A. Obulesh
9. Dr. K. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathew	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

ENTERPRISE CLOUD CONCEPTS LAB (LAB -IV)

M.Tech I Year II Semester

Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Implement and manage virtual machines using virtualization tools such as VirtualBox and VMware.
2. Develop and execute programs in virtualized environments using different operating systems and compilers.
3. Deploy and test cloud-based web applications using platforms such as Google App Engine.
4. Configure and manage cloud infrastructure services using tools such as OpenStack.
5. Implement big data processing using Hadoop single-node clusters and execute basic data processing applications.

List of Experiments:

1. Install Virtualbox/VMware Workstation with different flavors of linux or windows OS on top of windows7 or 8.
2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
3. Install Google App Engine. Create a hello world app and other simple web applications using python/java..
4. Find a procedure to transfer the files from one virtual machine to another virtual machine.
5. Find a procedure to launch virtual machine using trystack (Online Openstack Demo Version)
6. Install Hadoop single node cluster and run simple applications like word count.

E-Resources:

1. https://www.iitk.ac.in/nt/faq/vbox.htm
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjqrNG0za73AhXZt1YBHZ21DWEQFnoECAMQAQ&url=http%3A%2F%2Fwww.cs.columbia.edu%2F~sedwards%2Fclasses%2F2015%2F1102fall%2Flinuxvm.pdf&usg=AOvVaw3xZPuF5xVgkAQnBRsTtHz

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Raghavani
5. Dr. M. Rama Bai	6. Dr. Kalyan Chervepalli	7. Mr. G. Srija	8. Dr. A. Obulesh
9. Dr. A.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K. Ramesh Kannan	14. Dr. D. Sadhya		**M. Tech (CSE – R26)**

3. https://www.cloudsimtutorials.online/cloudsim/
4. https://edwardsamuel.wordpress.com/2014/10/25/tutorial-creating-openstack-instance-in-trystack/
5. https://www.edureka.co/blog/install-hadoop-single-node-hadoop-cluster

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Kagitmani
5. Dr. M. Raina Bai	6. Dr. Sahasi Surepalli	7. Ms. G. Sujia	8. Dr. A. Obulesh
9. Dr. A.S.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Ramesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

CYBER SECURITY LAB (LAB -IV)

M.Tech I Year II Semester
Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Identify and analyze cyber security threats and vulnerabilities using practical security tools.
2. Perform network security analysis using tools such as NMAP, Wireshark, and Snort.
3. Implement cryptographic techniques and password security mechanisms using security tools and OpenSSL.
4. Apply digital forensics techniques to analyze emails, file systems, registry data, and memory images.
5. Conduct network and system security investigations using forensic tools such as Autopsy, FTK Imager, and Network Miner.

List of Experiments

1. Perform an Experiment for port scanning with NMAP.
2. Setup a honeypot and monitor the honeypot on the network
3. Install Jcrpt /Cryptool tool (or any other equivalent) and demonstrate Asymmetric, Symmetric crypto algorithm, Hash and Digital/PKI signatures.
4. Generate minimum 10 passwords of length 12 characters using open SSL command
5. Perform practical approach to implement Foot printing-Gathering target information using Dmitry-Dmagic, UAtester.
6. Working with sniffers for monitoring network communication (Wireshark).
7. Use Snort to perform real time traffic analysis and packet logging.
8. Perform email analysis using Autopsy tool.
9. Perform Registry analysis and get boot time logging using process monitor tool
10. Perform File type detection using Autopsy tool
11. Perform Memory capture and analysis using FTK imager tool
12. Perform Network analysis using the Network Miner tool

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. K. Vijay Kumar	4. Dr. M. Nagaratna
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Jyothi	8. Dr. A. Obulesh
9. Dr. MRK Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

TEXT BOOKS

1. Real Digital Forensics for Handheld Devices, E. P. Dorothy, Auerback Publications, 2013.
2. Handbook of Digital Forensics and Investigation, E. Casey, Academic Press, 2010

REFERENCE BOOKS:

1. The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics, J. Sammons, Syngress Publishing, 2012.
2. Malware Forensics Field Guide for Windows Systems: Digital Forensics Field Guides, C. H. Malin, E. Casey and J. M. Aquilina, Syngress, 2012
3. The Best Damn Cybercrime and Digital Forensics Book Period, J. Wiles and A.Reyes, Syngress, 2007.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. KVK Sarma	10. Dr. N.Anusha	11. Dr. Ravi Mather	12. Dr. G. Ramesh
13. Dr. K.Rajesh Kannan	14. Dr. B. Sridhar		**M. Tech (CSE – R26)**

PARALLEL COMPUTING LAB (LAB -IV)

M.Tech I Year II Semester

Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Understand and implement parallel programming concepts using MPI, OpenMP, and Pthreads.
2. CO2: Develop parallel programs for matrix operations such as matrix-vector and matrix-matrix multiplication.
3. CO3: Implement parallel sorting algorithms such as Bubble Sort, Quick Sort, and Bucket Sort using parallel programming constructs.
4. CO4: Design and implement parallel graph algorithms including DFS, BFS, and Prim's algorithm.
5. CO5: Analyze the performance and efficiency of parallel programs and compare them with sequential implementations.

List of Programs:

1. Design a parallel program to implement Matrix-Vector and Matrix-Matrix Multiplication using MPI library.
2. Design a parallel program to implement Bubble Sort using OpenMP and Pthread Programming Constructs.
3. Design a parallel program to implement Quick Sort using OpenMP and Pthread Programming Constructs.
4. Design a parallel program to implement Bucket Sort using OpenMP and Pthread Programming Constructs.
5. Design a parallel program to implement Prim's Algorithm using OpenMP and Pthread Programming Constructs.
6. Design a parallel program to implement DFS Algorithm using OpenMP and Pthread Programming Constructs.
7. Design a parallel program to implement BFS Algorithm using OpenMP and Pthread Programming Constructs.
8. Design a parallel program to implement Dijkstra's Algorithm using MPI library.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagmani
5. Dr. M. Rama Bai	6. Dr. Kalyana Satyapalli	7. Ms. G. Sujata	8. Dr. A. Obulesh
9. Dr. K.V.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

LARGE LANGUAGE MODELS LAB (LAB -IV)

M.Tech I Year II Semester

Course Code:

L	T	P	C
0	0	4	2

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the architecture and working principles of transformer-based Large Language Models.
2. Implement tokenization, pretraining concepts, and fine-tuning methods for LLMs.
3. Apply prompt engineering techniques for solving real-world NLP tasks.
4. Evaluate and deploy LLM applications using open-source frameworks.
5. Analyze ethical considerations, bias issues, and emerging trends in LLM research.

List of Experiments

1. Write a Python program using **the Hugging Face Transformers** library to generate text using a pre-trained **GPT-2** transformer model.
2. Implement a program to visualize and analyze the **self-attention mechanism** of a transformer model using **BERT.**
3. Write a Python program to demonstrate different **tokenization techniques** such as BPE, WordPiece, and SentencePiece using the Hugging Face tokenizer library.
4. Implement a program to fine-tune a pretrained transformer model on a custom dataset for a **text classification task.**
5. Write a program to demonstrate **zero-shot and few-shot prompting techniques** for text generation using an open-source LLM.
6. Develop a simple **LLM-based chatbot** using **LangChain** and an open-source transformer model.
7. Write a program to evaluate the performance of an LLM using standard NLP evaluation metrics such as **BLEU Score** and **ROUGE Score.**
8. Implement a Python program to deploy an LLM as a REST API using **FastAPI** for real-time text generation.

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5. Dr. M. Rama Bai	6. Dr. Kalyan Chervupalli	7. Ms. G.Sirisha	8. Dr. A. Obulesh
9. Dr. K.V.K.Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K.Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

9. Write a program to analyze and identify **bias and fairness issues** in generated responses from a language model.
10. Implement a **Retrieval-Augmented Generation (RAG)** system using **LlamaIndex** and **FAISS** for document-based question answering.

TEXT BOOKS

1. Natural Language Processing with Transformers, Lewis Tunstall, Leandro von Werra, and Thomas Wolf, O'Reilly Media, 2022.
2. Speech and Language Processing, Daniel Jurafsky and James H. Martin, Pearson Education.
3. Deep Learning, Ian Goodfellow, Yoshua Bengio, and Aaron Courville, MIT Press.

REFERENCE BOOKS

1. Attention Is All You Need, Ashish Vaswani et al., NeurIPS, 2017.
2. BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding, Jacob Devlin et al., NAACL, 2019.
3. Language Models are Few-Shot Learners, Tom B. Brown et al., NeurIPS, 2020.
4. Exploring the Limits of Transfer Learning with a Unified Text-to-Text Transformer, Colin Raffel et al., Journal of Machine Learning Research.
5. LLaMA: Open and Efficient Foundation Language Models, Hugo Touvron et al., 2023.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Saiverpalli	7. Ms. J. Srija	8. Dr. A. Obulesh
9. Dr. Ajeet K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mukkamala	12. Dr. Ch. Ramesh
13. Dr. K Raghavendra Kannan	14. Dr. D. Sandeep		**M. Tech (CSE – R26)**

DIGITAL FORENSICS (PROFESSIONAL ELECTIVE - V)

M.Tech II Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of digital forensics, cybercrime investigation, and forensic science.
2. Analyze cybercrime scenes and electronic evidence using appropriate forensic investigation procedures.
3. Apply digital evidence collection, preservation, and analysis techniques following legal and ethical guidelines.
4. Perform computer and network forensic investigations using forensic tools and methodologies.
5. Examine mobile device forensics and legal aspects of digital forensics, including IT laws and evidence handling procedures.

UNIT-I

Digital Forensics Science: Forensics science, computer forensics, and digital forensics. Computer **Crime:** Criminalistics as it relates to the investigative process, analysis of cyber criminalistics area, holistic approach to cyber-forensics

UNIT-II

Cyber Crime Scene Analysis: Discuss the various court orders etc., methods to search and seizure electronic evidence, retrieved and un-retrieved communications, Discuss the importance of understanding what court documents would be required for a criminal investigation.

UNIT-III

Evidence Management & Presentation: Create and manage shared folders using operating system, importance of the forensic mindset, define the workload of law enforcement, Explain what the normal case would look like, Define who should be notified of a crime, parts of gathering evidence, Define and apply probable cause.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijaykumar	4. Dr. M. Nageswari
5. Dr. M. Radha Rai	6. Dr. Kalyan Satyapalli	7. Ms. P. Srija	8. Dr. A. Obulesh
9. Dr. K. Rama Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

UNIT-IV

Computer Forensics: Prepare a case, Begin an investigation, Understand computer forensics workstations and software, Conduct an investigation, Complete a case, Critique a case,

Network Forensics: open-source security tools for network forensic analysis, requirements for preservation of network data.

UNIT-V

Mobile Forensics: mobile forensics techniques, mobile forensics tools.

Legal Aspects of Digital Forensics: IT Act 2000, amendment of IT Act 2008. Recent trends in mobile forensic technique and methods to search and seizure electronic evidence

TEXT BOOKS:

1. John Sammons, The Basics of Digital Forensics, Elsevier
2. John Vacco, Computer Forensics: Computer Crime Scene Investigation, Laxmi Publications

REFERENCE BOOKS:

1. William Oettinger, Learn Computer Forensics: A beginner's guide to searching, analyzing, and securing digital evidence, Packt Publishing; 1st edition (30 April 2020), ISBN : 1838648178.
2. Thomas J. Holt , Adam M. Bossler, Kathryn C. Seigfried-Spellar , Cybercrime and Digital Forensics: An Introduction, Routledge.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Jaivan Sarvepalli	7. Ms. [illegible]	8. Dr. A. Obulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mather	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

ADVANCED OPERATING SYSTEMS (PROFESSIONAL ELECTIVE - V)

M.Tech II Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the design approaches of advanced operating systems
2. Analyze the design issues of distributed operating systems.
3. Evaluate design issues of multi-processor operating systems.
4. Identify the requirements Distributed File System and Distributed Shared Memory.
5. Formulate the solutions to schedule the real time applications.

UNIT-I

Architectures of Distributed Systems: System Architecture Types, Distributed Operating Systems, Issues in Distributed Operating Systems, Communication Primitives. Theoretical Foundations: Inherent Limitations of a Distributed System, Lamport's Logical Clocks, Vector Clocks, Causal Ordering of Messages, Termination Detection.

UNIT-II

Distributed Mutual Exclusion: The Classification of Mutual Exclusion Algorithms, Non-Token – Based Algorithms: Lamport's Algorithm, The Ricart-Agrawala Algorithm, Maekawa's Algorithm, Token-Based Algorithms: Suzuki-Kasami's Broadcast Algorithm, Singhal's Heurisric Algorithm, Raymond's Heuristic Algorithm.

UNIT-III

Distributed Deadlock Detection: Preliminaries, Deadlock Handling Strategies in Distributed Systems, Issues in Deadlock Detection and Resolution, Control Organizations for Distributed Deadlock Detection, Centralized- Deadlock – Detection Algorithms, Distributed Deadlock Detection Algorithms, Hierarchical Deadlock Detection Algorithms

UNIT-IV

Multiprocessor System Architectures: Introduction, Motivation for multiprocessor Systems, Basic Multiprocessor System Architectures Multi Processor Operating Systems: Introduction, Structures of Multiprocessor Operating Systems, Operating Design Issues, Threads, Process Synchronization, Processor Scheduling.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarepalli	7. Ms. [illegible]rija	8. Dr. A. Obulesu
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathew	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sadaiah		**M. Tech (CSE – R26)**

Distributed File Systems: Architecture, Mechanisms for Building Distributed File Systems, Design Issues

UNIT-V

Distributed Scheduling: Issues in Load Distributing, Components of a Load Distributed Algorithm, Stability, Load Distributing Algorithms, Requirements for Load Distributing, Task Migration, Issues in task Migration Distributed Shared Memory: Architecture and Motivation, Algorithms for Implementing DSM, Memory Coherence, Coherence Protocols, Design Issues

TEXT BOOKS:

1. Advanced Concepts in Operating Systems, Mukesh Singhal, Niranjan G. Shivaratri, Tata McGraw-Hill Edition 2001.

REFERENCE BOOKS:

1. Distributed Systems: Andrew S. Tanenbaum, Maarten Van Steen, Pearson Prentice Hall, Edition – 2, 2007.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. K. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. Sirija	8. Dr. A. Obulesh
9. Dr. K. V. K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Ramesh Kannan	14. Dr. B. Sateja		**M. Tech (CSE – R26)**

QUANTUM COMPUTING (PROFESSIONAL ELECTIVE - V)

M.Tech II Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of quantum computing, including linear algebra, complex numbers, and quantum mechanics principles.
2. Analyze the physical implementation of qubits and quantum states, including entanglement and quantum hardware concepts.
3. Design and implement quantum circuits and quantum gates for performing quantum computations.
4. Apply quantum algorithms such as Deutsch-Jozsa, Bernstein-Vazirani, Simon's, Shor's, and Grover's algorithms.
5. Evaluate the impact of quantum computing on modern cryptographic systems and security mechanisms

UNIT-I

Introduction to Essential Linear Algebra: Some Basic Algebra, Matrix Math, Vectors and Vector Spaces, Set Theory

Complex Numbers: Definition of Complex Numbers, Algebra of Complex Numbers, Complex Numbers Graphically, Vector Representations of Complex Numbers, Pauli Matrice, Transcendental Numbers

UNIT-II

Basic Physics for Quantum Computing: The Journey to Quantum, Quantum Physics Essentials, Basic Atomic Structure, Hilbert Spaces, Uncertainty, Quantum States, Entanglement

Basic Quantum Theory: Further with Quantum Mechanics, Quantum Decoherence, Quantum Electrodynamics, Quantum Chromodynamics, Feynman Diagram Quantum Entanglement and QKD, Quantum Entanglement, Interpretation, QKE

UNIT-III

Quantum Architecture: Further with Qubits, Quantum Gates, More with Gates, Quantum Circuits, The D-Wave Quantum Architecture

Quantum Hardware: Qubits, How Many Qubits Are Needed? Addressing Decoherence, Topological Quantum Computing, Quantum Essentials

UNIT-IV

Quantum Algorithms: What Is an Algorithm? Deutsch's Algorithm, Deutsch-Jozsa Algorithm, Bernstein-Vazirani Algorithm, Simon's Algorithm, Shor's Algorithm, Grover's Algorithm

UNIT-V

Current Asymmetric Algorithms: RSA, Diffie-Hellman, Elliptic Curve

The Impact of Quantum Computing on Cryptography: Asymmetric Cryptography, Specific Algorithms, Specific Applications.

TEXT BOOKS:

1. Nielsen M. A., Quantum Computation and Quantum Information, Cambridge University Press
2. Dr. Chuck Easttom, Quantum Computing Fundamentals, Pearson

REFERENCE BOOKS:

1. Quantum Computing for Computer Scientists by Noson S. Yanofsky and Mirco A. Mannucci
2. Benenti G., Casati G. and Strini G., Principles of Quantum Computation and Information, Vol. Basic Concepts, Vol
3. Basic Tools and Special Topics, World Scientific. Pittenger A. O., An Introduction to Quantum Computing Algorithms.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. [illegible] Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sairepalli	7. Ms. [illegible]	8. Dr. A. Obulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mutkule	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

PROMPT ENGINEERING (PROFESSIONAL ELECTIVE - IV)

M.Tech II Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Explain and apply the core principles of prompt engineering for guiding generative AI outputs effectively.
2. Describe the underlying architecture and functionality of state-of-the-art large language models (LLMs).
3. Generate and manipulate structured outputs (JSON, YAML, CSV) using ChatGPT with advanced prompting techniques.
4. Implement text chunking, tokenization, and format control using tools like SpaCy, Tiktoken, and Python.
5. Utilize vector databases such as FAISS and Pinecone in Retrieval-Augmented Generation (RAG) pipelines for efficient information retrieval.

UNIT-I

Fundamentals and Principles of Prompting: Overview of the Five Principles of Prompting: Give Direction, Specify Format, Provide Examples, Evaluate Quality, Divide Labor.

UNIT-II

Introduction to Large Language Models for Text Generation: What Are Text Generation Models, Vector Representations: The Numerical Essence of Language, Transformer Architecture: Orchestrating Contextual Relationships, Probabilistic Text Generation: The Decision Mechanism, Historical Underpinnings: The Rise of Transformer Architectures, OpenAI's Generative Pretrained Transformers, GPT-3.5-turbo and ChatGPT, GPT-4, Google's Gemini, Meta's Llama and Open Source.

UNIT-III

Standard Practices for Text Generation with ChatGPT- Part-A Generating Lists, Hierarchical List Generation, When to Avoid Using Regular Expressions, Generating JSON, YAML Filtering YAML Payloads, Handling Invalid Payloads in YAML, Diverse Format Generation with ChatGPT, Mock CSV Data, Universal Translation Through LLMs, Ask for Context, Text Style Unbundling, Identifying the Desired Textual Features,

Generating New Content with the Extracted Features, Extracting Specific Textual Features with LLMs.

UNIT-IV

Standard Practices for Text Generation with ChatGPT- Part-B Chunking Text, Benefits of Chunking Text, Scenarios for Chunking Text, Poor Chunking Example, Chunking Strategies, Sentence Detection Using SpaCy, building a Simple Chunking Algorithm in Python, Sliding Window Chunking, Text Chunking Packages, Text Chunking with Tiktoken, Encodings, Understanding the Tokenization of Strings.

UNIT-V

Vector Databases with FAISS and Pinecone Retrieval Augmented Generation (RAG), Introducing Embeddings, Document Loading Memory Retrieval with FAISS, RAG with Lang Chain, Hosted Vector Databases with Pinecone, Self Querying, Alternative Retrieval Mechanisms.

TEXTBOOKS:

1. Phoenix J, Taylor M. Prompt engineering for generative AI. " O'Reilly Media, Inc."; 2024 May 16.

REFERENCE BOOKS:

1. Tunstall L, Von Werra L, Wolf T. Natural language processing with transformers. " O'Reilly Media, Inc."; 2022 Jan 26.
2. Foster D. Generative deep learning. " O'Reilly Media, Inc."; 2022 Jun 28.

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. [illegible]	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. [illegible]	8. Dr. A. Obulesh
9. Dr. [illegible]	10. Dr. P. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K. [illegible]	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

INTRUSION DETECTION SYSTEMS (OPEN ELECTIVE)

M.Tech II Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamentals of computer and network security, including common threats, vulnerabilities, firewalls, VPNs, and the role of Intrusion Detection and Prevention Systems (IDS/IPS).
2. Analyze different classes of cyber attacks and attackers across network, application, and human layers, including automated threats such as worms and viruses.
3. Explain the architecture and taxonomy of Intrusion Detection Systems and implement signature-based detection techniques using tools like **Snort.**
4. Evaluate anomaly detection methods and algorithms for identifying abnormal behavior in network and host-based systems, including rate-based and payload-based detection techniques.
5. Assess advanced security challenges such as malware, botnets, insider threats, and alert correlation, and apply modern strategies like collaborative security and zero-day attack detection.

UNIT-I

The state of threats against computers, and networked systems-Overview of computer security solutions and why they fail-Vulnerability assessment, firewalls, VPN's -Overview of Intrusion Detection and Intrusion Prevention, Network and Host-based IDS

UNIT-II

Classes of attacks - Network layer: scans, denial of service, penetration Application layer: software exploits, code injection-Human layer: Identity theft, root access-Classes of attackers-Kids/hackers/sop Hesitated groups-Automated: Drones, Worms, Viruses

UNIT-III

A General IDS model and taxonomy, Signature-based Solutions, Snort, Snort rules, Evaluation of IDS, Cost sensitive IDS

UNIT-IV

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. S. Teja	8. Dr. A. Obulesh
9. Dr. K.V.V. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

Anomaly Detection Systems and Algorithms-Network Behavior Based Anomaly Detectors (rate based)-Host-based Anomaly Detectors-Software Vulnerabilities-State transition, Immunology, Payload Anomaly Detection

UNIT-V

Attack trees and Correlation of alerts- Autopsy of Worms and Botnets-Malware detection Obfuscation, polymorphism- Document vectors. Email/IM security issues-Viruses/Spam-From signatures to thumbprints to zero day detection-Insider Threat issues-Taxonomy-Masquerade and Impersonation Traitors, Decoys and Deception-Future: Collaborative Security

TEXT BOOKS:

1. Peter Szor, The Art of Computer Virus Research and Defense, Symantec Press ISBN 0-321- 30545-3.
2. Markus Jakobsson and Zulfikar Ramzan, Crimeware, Understanding New Attacks and Defenses.

REFERENCE BOOKS:

1. Saiful Hasan, Intrusion Detection System, Kindle Edition.
2. Ankit Fadia, Intrusion Alert: An Ethical Hacking Guide to Intrusion Detection.

Online Websites/Materials:

1. https://www.intechopen.com/books/intrusion-detection-systems/

Online Courses:

1. https://www.sans.org/course/intrusion-detection-in-depth
2. https://www.cybrary.it/skill-certification-course/ids-ips-certification-training-course

1. Dr. O. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. M. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Chervepalli	7. Ms. P. Srija	8. Dr. A. Obulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Baliga		**M. Tech (CSE – R26)**

DIGITAL FORENSICS (OPEN ELECTIVE)

M.Tech II Year I Semester

Course Code:

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts of digital forensics, cybercrime investigation, and forensic science.
2. Analyze cybercrime scenes and electronic evidence using appropriate forensic investigation procedures.
3. Apply digital evidence collection, preservation, and analysis techniques following legal and ethical guidelines.
4. Perform computer and network forensic investigations using forensic tools and methodologies.
5. Examine mobile device forensics and legal aspects of digital forensics, including IT laws and electronic evidence handling procedures.

UNIT-I

Digital Forensics Science: Forensics science, computer forensics, and digital forensics. Computer Crime: Criminalistics as it relates to the investigative process, analysis of cyber criminalistics area, holistic approach to cyber-forensics

UNIT-II

Cyber Crime Scene Analysis: Discuss the various court orders etc., methods to search and seizure electronic evidence, retrieved and un-retrieved communications, Discuss the importance of understanding what court documents would be required for a criminal investigation.

UNIT-III

Evidence Management & Presentation: Create and manage shared folders using operating system, importance of the forensic mindset, define the workload of law enforcement, Explain what the normal case would look like, Define who should be notified of a crime, parts of gathering evidence, Define and apply probable cause.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. [illegible] Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sasidhar	7. Ms. G. Raja	8. Dr. A. Obulesh
9. Dr. V.R.K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. C. Ramesh
13. Dr. K Ramesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

UNIT-IV

Computer Forensics: Prepare a case, Begin an investigation, Understand computer forensics workstations and software, Conduct an investigation, Complete a case, Critique a case,

Network Forensics: open-source security tools for network forensic analysis, requirements for preservation of network data.

UNIT-V

Mobile Forensics: mobile forensics techniques, mobile forensics tools.

Legal Aspects of Digital Forensics: IT Act 2000, amendment of IT Act 2008. Recent trends in mobile forensic technique and methods to search and seizure electronic evidence

TEXT BOOKS:

1. John Sammons, The Basics of Digital Forensics, Elsevier
2. John Vacca, Computer Forensics: Computer Crime Scene Investigation, Laxmi Publications

REFERENCE BOOKS:

1. William Oettinger, Learn Computer Forensics: A beginner's guide to searching, analyzing, and securing digital evidence, Packt Publishing; 1st edition (30 April 2020), ISBN : 1838648178.
2. Thomas J. Holt, Adam M. Bossler, Kathryn C. Seigfried-Spellar , Cybercrime and Digital Forensics: An Introduction, Routledge.

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ENGLISH FOR RESEARCH PAPER WRITING
(AUDIT COURSE)

M.Tech I Year
Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the varies of technical communication.
2. Understand the formatting of a research paper.
3. Write a paper for publication in a standard journal.
4. Work on citations and ably place them in his/her research work.
5. Understand the importance of plagiarism and how to avoid the same

UNIT-I

Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness

UNIT-II

Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction

UNIT-III

Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.

UNIT-IV

Key skills are needed when writing a title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature,

UNIT-V

Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions, useful phrases, how to ensure paper is as good as it could

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. [illegible] Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. G. [illegible]ja	8. Dr. A. Obulesh
9. Dr. K. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. D. Sujatha		M. Tech (CSE – R26)

possibly be the first- time submission

TEXT BOOKS:

1. Goldbort R, Writing for Science, Yale University Press,2nd Edition, 2019.
2. Day R, How to Write and Publish a Scientific Paper, Cambridge University Press, 9th Edition, 2020.
3. Highman N.J. , Handbook of Writing for the Mathematical Sciences, SIAM. Highman's book,3rd Edition, 2019.

REFERENCE BOOKS:

1. Adrian Wallwork, English for Writing Research Papers, Springer 3rd Edition, 2023.
2. MLA Hand book for writers of Research Papers, Modern Language Association, 9th Edition, 2021.
3. C. R Kothari, Gaurav, Garg, Research Methodology Methods and Techniques, New Age International Publishers, 4th Edition, 2022.

ONLINE RESOURCES:

https://nptel.ac.in/courses/110105091

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyani Sirivepalli	7. Ms. K. Soja	8. Dr. A. Chuleeb
9. Dr. R.B.V. Sarma	10. Dr. B. Anusha	11. Dr. Ravi Mathey	12. Dr. C.G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		**M. Tech (CSE – R26)**

DISASTER MANAGEMENT
(AUDIT COURSE)

M.Tech I Year
Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Perceive the various types of disaster.
2. Interpret the various types of Hazards and Vulnerability.
3. Perceive different approaches of disaster risk reduction.
4. Describe the disaster management and safety plan.
5. Discuss the various disaster risks in India.
6. Understand the importance of plagiarism and how to avoid the same

UNIT-I

Introduction:

Disaster: Definition, Factors and Significance; Difference Between Hazard and Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.

Disaster Prone Areas in India:

Study of Seismic Zones; Areas Prone to Floods and Droughts, Landslides and Avalanches; Areas Prone to Cyclonic and Coastal Hazards with Special Reference to Tsunami; Post- Disaster Diseases and Epidemics

UNIT-II

Repercussions of Disasters and Hazards:

Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts and Famines, Landslides and Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks and Spills, Outbreaks of Disease and Epidemics, War and Conflicts.

UNIT-III

Disaster Preparedness and Management:

Preparedness: Monitoring of Phenomena Triggering A Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological and

Other Agencies, Media Reports: Governmental and Community Preparedness.

UNIT-IV

Risk Assessment Disaster Risk:

Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co-Operation in Risk Assessment and Warning, People's Participation in Risk Assessment. Strategies for Survival.

UNIT-V

Disaster Mitigation:

Meaning, Concept and Strategies of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation and Non-Structural Mitigation, Programs of Disaster Mitigation in India.

TEXT BOOKS

1. R. Nishith and A. K. Singh, Disaster Management in India: Perspectives, Issues and Strategies. New Royal Book Company, 2nd Edition, 2021.
2. P. Sahni, Ed., Disaster Mitigation: Experiences and Reflections. Prentice Hall of India, 2nd Edition, 2022.
3. J. K. Levy and C. Gopalakrishnan, Towards Disaster Risk Reduction: A Policy- Focused
4. Approach to Natural Hazards and Disasters, Routledge, 2nd Edition, 2021

REFERENCES:

1. P. Sigamani et al., Disaster Risk Reduction and Management in India: Emerging Challenges and Way Forward. New Delhi, India, 2022.
2. A. Ahmad and J. Smith, Eds., Humanitarian Action and Ethics, London, Publishing, 2020.
3. I. Kelman, J. Mercer, and J. Gaillard, The Routledge Handbook of Disaster Risk Reduction Including Climate Change Adaptation., 2022.

ONLINE REFERENCES:

https://onlinecourses.swayam2.ac.in/ini25_hs32/

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. D. Asha	8. Dr. A. Obulesh
9. Dr. Vivek Sarpe	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sai Raja		M. Tech (CSE – R26)

SANSKRIT FOR TECHNICAL KNOWLEDGE
(AUDIT COURSE)

M.Tech I Year

Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Understanding basic Sanskrit language
2. Ancient Sanskrit literature about science & technology can be understood
3. Being a logical language will help to develop logic in students

UNIT-I

Alphabets in Sanskrit

UNIT-II

Past/Present/Future Tense, Simple Sentences

UNIT-III

Order, Introduction of roots,

UNIT-IV

Technical information about Sanskrit Literature

UNIT-V

Technical concepts of Engineering-Electrical, Mechanical, Architecture, Mathematics

TEXT BOOKS/ REFERENCES:

1. "Abhyaspustakam" – Dr. Vishwas, Samskrita-Bharti Publication, New Delhi
2. "Teach Yourself Sanskrit" Prathama Deeksha-Vempati Kutumbshastri, Rashtriya Sanskrit Sansthanam, New Delhi Publication
3. "India's Glorious Scientific Tradition" Suresh Soni, Ocean books (P) Ltd., 2020

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. [illegible] Kumar	4. Dr. M. Nagamani
5. Dr. M. Hema Bai	6. Dr. Kalyan Sarvepalli	7. [illegible] Dr. Srija	8. Dr. A. Obulesu
9. Dr. P. V. V. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. G. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. D. Sujatha		**M. Tech (CSE – R26)**

VALUE EDUCATION
(AUDIT COURSE)

M.Tech I Year
Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Understand value of education and self- development
2. Imbibe good values in students
3. Let the should know about the importance of character

UNIT-I

Values and self-development –Social values and individual attitudes. Work ethics, Indian vision of humanism. Moral and non- moral valuation. Standards and principles. Value judgements

UNIT-II

Importance of cultivation of values. Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. Honesty, Humanity. Power of faith, National Unity. Patriotism. Love for nature, Discipline

UNIT-III

Personality and Behavior Development - Soul and Scientific attitude. Positive Thinking. Integrity and discipline, Punctuality, Love and Kindness.

UNIT-IV

Avoid fault Thinking. Free from anger, Dignity of labour. Universal brotherhood and religious tolerance. True friendship. Happiness Vs suffering, love for truth. Aware of self-destructive habits. Association and Cooperation. Doing best for saving nature

UNIT-V

Character and Competence –Holy books vs Blind faith. Self-management and Good health. Science of reincarnation, Equality, Nonviolence, Humility, Role of Women. All religions and same message. Mind your Mind, Self-control. Honesty, Studying effectively

TEXT BOOKS/ REFERENCES:

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. [illegible] Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. P. Srija	8. Dr. A. Obulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

1. Chakroborty, S.K. "Values and Ethics for organizations Theory and practice", Oxford University Press, New Delhi

1. Dr. B. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Ajay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyani Sarvepalli	7. Ms. M. Anuja	8. Dr. A. Obulesh
9. Dr. K.V.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathew	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. S. Sujatha		M. Tech (CSE – R26)

CONSTITUTION OF INDIA
(AUDIT COURSE)

M.Tech I Year
Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the historical background and philosophy of the Indian Constitution.
2. Explain fundamental rights, duties, and directive principles.
3. Describe the structure, powers, and functions of key constitutional bodies.
4. Understand local governance structures and the importance of grassroots democracy.
5. Analyze the role of the Election Commission and welfare institutions for SC/ST/OBC and women.

UNIT-I

History of Making of the Indian Constitution: History Drafting Committee, (Composition & Working).

Philosophy of the Indian Constitution: Preamble, Salient Features

UNIT-II

Contours of Constitutional Rights & Duties: Fundamental Rights Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.

UNIT-III

Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualification, Powers and Functions

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. [illegible] Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyani Sarvepalli	7. Ms. G. Srija	8. Dr. A. Obulesh
9. Dr. K. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sudha		M. Tech (CSE – R26)

UNIT-IV

Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Pachayati raj: Introduction, PRI: Zila Pachayat. Elected officials and their roles, CEO Zila Pachayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy

UNIT-V

Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

TEXT BOOKS/ REFERENCES:

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. [illegible] Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Mrs. S. Sirja	8. Dr. A. Obulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. [illegible] Ramesh
13. Dr. K Rajesh Kannan	14. Dr. [illegible] Sarkar		M. Tech (CSE – R26)

PEDAGOGY STUDIES
(AUDIT COURSE)

M.Tech I Year
Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Understand key concepts and methods in pedagogy research.
2. Identify teaching practices in diverse classroom settings.
3. Analyze effective pedagogy and the role of teacher education.
4. Evaluate professional development and classroom support.
5. Recognize research gaps and future directions in education.

UNIT-I

Introduction and Methodology: Aims and rationale, Policy background, Conceptual framework and terminology Theories of learning, Curriculum, Teacher education. Conceptual framework, Research questions. Overview of methodology and Searching.

UNIT-II

Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. Curriculum, Teacher education.

UNIT-III

Evidence on the effectiveness of pedagogical practices, Methodology for the in depth stage: quality assessment of included studies. How can teacher education (curriculum and practicum) and the scho curriculum and guidance materials best support effective pedagogy? Theory of change. Strength and nature of the body of evidence for effective pedagogical practices. Pedagogic theory and pedagogical approaches. Teachers' attitudes and beliefs and Pedagogic strategies.

UNIT-IV

Professional development: alignment with classroom practices and follow-up support, Peer support, Support from the head teacher and the community.

1.Dr. D. Aruna Kumari	2. Dr. B. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Mr. T. Srija	8. Dr. A. Obulesh
9. Dr. K.V.K. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. T.N. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sudhir		M. Tech (CSE – R26)

Curriculum and assessment, Barriers to learning: limited resources and large class sizes

UNIT-V

Research gaps and future directions: Research design, Contexts, Pedagogy, Teacher education, Curriculum and assessment, Dissemination and research impact.

TEXT BOOKS

1. Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, Compare, 31 (2): 245-261.
2. Agrawal M (2004) Curricular reform in schools: The importance of evaluation, Journal of Curriculum Studies, 36 (3): 361-379.
3. Akyeampong K (2003) Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER) country report 1. London: DFID.
4. Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? International Journal Educational Development, 33 (3): 272–282

REFERENCES:

1. Alexander RJ (2001) Culture and pedagogy: International comparisons in primary education. Oxford and Boston: Blackwell.
2. Chavan M (2003) Read India: A mass scale, rapid, 'learning to read' campaign.
3. www.pratham.org/images/resource%20working%20paper%202.pdf.

1.Dr. U. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyani Sayyapalli	7. Mr. G. Srija	8. Dr. A. Obulesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathey	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sujatha		M. Tech (CSE – R26)

STRESS MANAGEMENT BY YOGA
(AUDIT COURSE)

M.Tech I Year
Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Develop healthy mind in a healthy body thus improving social health also improve efficiency

UNIT-I

Definitions of Eight parts of yoga. (Ashtanga)

UNIT-II

Yam and Niyam.

UNIT-III

Do's and Don't's in life.

i) Ahinsa, satya, astheya, bramhacharya and aparigraha
ii) Shaucha, santosh, tapa, swadhyay, ishwarpranidhan

UNIT-IV

Asan and Pranayam

UNIT-V

i) Various yog poses and their benefits for mind & body
ii) Regularization of breathing techniques and its effects-Types of pranayam

TEXT BOOKS/ REFERENCES:

1. "Yogic Asanas for Group Tarining-Part-I": Janardan Swami Yogabhyasi Mandal, Nagpur
2. "Rajayoga or conquering the Internal Nature" by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata
3. https://nptel.ac.in/courses/121105009

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3. Dr. V. Raj Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Rajkan Shivpalli	7. Ms. G. Vijaya	8. Dr. A. Ghatesh
9. Dr. [illegible] Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathew	12. Dr. [illegible] Ramesh
13. Dr. K. Rajesh Kannan	14. Dr. B. Sobha		**M. Tech (CSE – R26)**

PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS (AUDIT COURSE)

Course Code:

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course, student will be able to:

1. Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
2. The person who has studied Geeta will lead the nation and mankind to peace and prosperity
3. Study of Neetishatakam will help in developing versatile personality of students

UNIT-I

Neetisatakam-Holistic development of personality

- Verses- 19,20,21,22 (wisdom)
- Verses- 29,31,32 (pride & heroism)
- Verses- 26,28,63,65 (virtue)

UNIT-II

Neetisatakam-Holistic development of personality

- Verses- 52,53,59 (dont's)
- Verses- 71,73,75,78 (do's)

UNIT-III

Approach to day-to-day work and duties.

- Shrimad Bhagwad Geeta: Chapter 2-Verses 41, 47,48,
- Chapter 3-Verses 13, 21, 27, 35, Chapter 6-Verses 5,13,17, 23, 35,
- Chapter 18-Verses 45, 46, 48,

UNIT-IV

Statements of basic knowledge.

- Shrimad Bhagwad Geeta: Chapter2-Verses 56, 62, 68
- Chapter 12 -Verses 13, 14, 15, 16,17, 18

1.Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. [illegible] Vijay Kumar	4. Dr. M. Nagamani
5. Dr. M. Rama Bai	6. Dr. Kalyan Sarvepalli	7. Ms. [illegible]	8. Dr. A. Obulesh
9. Dr. [illegible]K Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. [illegible] Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sailaja		M. Tech (CSE – R26)

- Personality of Role model. Shrimad Bhagwad Geeta:

UNIT-V

- Chapter2-Verses 17, Chapter 3-Verses 36,37,42,
- Chapter 4-Verses 18, 38,39
- Chapter18 – Verses 37,38,63

TEXT BOOKS/ REFERENCES:

1. "Srimad Bhagavad Gita" by Swami SwarupanandaAdvaita Ashram (Publication Department), Kolkata.
2. Bhartrihari's Three Satakam (Niti-sringar-vairagya) by P.Gopinath, Rashtriya Sanskrit Sansthanam, New Delhi.

1. Dr. D. Aruna Kumari	2. Dr. S. Suresh Kumar	3.Dr. V. [illegible] Kumar	4. Dr. M. Rajesmani
5. Dr. M. Radha Rao	6. Dr. Kalyan Sirvepalli	7. Mr. A. Srija	8. Dr. A. Obulesh
9. Dr. K.S.V. Sarma	10. Dr. N. Anusha	11. Dr. Ravi Mathur	12. Dr. Ch. Ramesh
13. Dr. K Rajesh Kannan	14. Dr. B. Sarala		**M. Tech (CSE – R26)**