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UNIVERSITY OF MYSORE

Estd. 1916

VishwavidyanilayaKaryasoudha
Crawford Hall, Mysuru- 570 005

No.AC2(S)/54/2024-25 Dated: 15.07.2024

Notification

Sub:-Syllabus and Scheme of Examinations of Artificial Intelligence and Data Science (AI & DS) programme (VII & VIII Semester) from the Academic year 2024-25.

Ref:-1. Decision of Board of Studies in Artificial Intelligence and Data Science (AI & DS) meeting held on 11-05-2024.
2. Decision of the Faculty of School of Engineering meeting held on 14-06-2024.
3. Decision of the Academic Council meeting held on 28-06-2024.

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The Board of Studies in Artificial Intelligence and Data Science (AI & DS) which met on 11-05-2024 has resolved to recommend & approved the Syllabus and Scheme of examinations of Artificial Intelligence and Data Science (AI & DS) programme (VII & VIII Semester) with effect from the Academic year 2024-25.

The Faculty of School of Engineering and Academic Council at their meetings held on 14-06-2024 and 28-06-2024 respectively has also approved the above said Syllabus and Scheme of examinations, hence it is hereby notified.

The Syllabus and Scheme of Examinations content may be downloaded from the University Website i.e., www.uni-mysore.ac.in.

Registrar

Registrar
University of Mysore
Mysore

To;

1. The Registrar (Evaluation), University of Mysore, Mysuru.
2. The Chairman, BOS/DOS Artificial Intelligence and Data Science (AI & DS) Manasagangothri, Mysore.
3. The Dean, Faculty of Engineering, DOS in MGM.
4. The Deputy Registrar/Assistant Registrar/Superintendent, Administrative Branch and Examination Branch, University of Mysore, Mysuru.
5. The PA to Vice-Chancellor/ Registrar/ Registrar (Evaluation), University of Mysore, Mysuru.
6. Office Copy.

MYSORE UNIVERSITY SCHOOL OF ENGINEERING

Scheme of Teaching and Examination 2021-2022(As per NEP-2020)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021–2022)

Artificial Intelligence and Data Science (AI&DS)

VII-SEMESTER

Sl. No.	Course & Course Code		Course Title	Teaching Dept.	Paper Setting Board	Teaching Hours/week			Examination				Credits
						Theory lectures	Tutorial	Practical/ Drawing	Examination in Hours	CIE Marks	SEE Marks	Total Marks	
						L	T	P					
1	IPCC	21AD71	Data Modeling and Visualization	AI&DS	AI&DS	2	2	2	03	50	50	100	4
2	PCC	21AD72	Algorithms for Clustering Data	AI&DS	AI&DS	2	2	0	03	50	50	100	3
3	PEC	21AD73X	Professional Elective -3	AI&DS	AI&DS	2	2	0	03	50	50	100	3
4	PEC	21AD73X	Professional Elective -4	AI&DS	AI&DS	2	2	0	03	50	50	100	3
5	Project	21ADP71	Project work Phase - 1	AI&DS	AI&DS	0	0	4	03	100		100	2
6	AEC	21AEC75X	Ability Enhancement Course-III	Any Dept.	Any Dept.	0	0	2		50		50	1
7	INT	21INT83	Summer Internship-II	Completed during the vacation of VI and VII semesters									
Total						08	08	08	15	350	200	550	16

Note: **PCC**: Professional Core Courses, **IPCC**: Integrated Professional Core Courses, **AI&DS**: Artificial Intelligence and Data Science, **PEC**: Professional Elective Course, **AEC:** Ability Enhancement Course, **PROJECT:** Project work phase-1 and **INT:** Internship.

Professional Elective-3 and Professional Elective-4				Ability Enhancement Course	
Course Code	Course Title	Course Code	Course Title	Course Code	Course Title
21AD731	Neural Networks and Deep Learning	21AD735	Multimedia Data Analysis	21AEC751	Project Management with Git
21AD732	Natural Language Processing	21AD736	Data Security and Privacy	21AEC752	Technical Writing using LaTeX
21AD733	High Performance Computing	21AD737	Block Chain Technology	21AEC753	C# and .NET Framework
21AD734	Statistical Analysis	21AD738	Business Data Intelligence	21AEC754	Data Clustering Applications

Credit Definition:
1-hour lecture(L) per week per semester = 1 Credit
2-hour tutorial (T) per week per semester = 1 Credit
2-hour Practical/Drawing (P) per week per semester = 1 Credit

Four-credit courses are to be designed for **50** hours of Teaching-Learning process.
Three credit courses are to be designed for **40** hours of Teaching-Learning process.
Two credit courses are to be designed for **25** hours of Teaching-Learning process.
One credit course is to be designed for **15** hours of Teaching-Learning process

Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Students can select any one of the professional electives offered by any department. Selection of a professional elective is not allowed provided,

- The candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of Departmental core courses, Open Electives or Professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.
- Registration to electives shall be documented under the guidance of Programme Coordinator/ Adviser/Mentor.

Project work: Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini project can be assigned to an individual student or to a group having not more than 4 students.
CIE procedure for Project:
(i) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the Mini-project work, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.
(ii) **Interdisciplinary:** Continuous Internal Evaluation shall be group wise at the college level with the participation of all the guides of the college. The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

AICTE Activity Points: AICTE Activity Points to be earned by students admitted to BE/B.Tech., day college programme (**For more details refer to Chapter 6, AICTE Activity Point Programme, Model Internship Guidelines**)

- Over and above the academic grades, every Day College regular student admitted to the 4 years Degree programme and every student entering 4 years Degree programme through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Programme.
- Students transferred from other Universities to the fifth semester are required to earn 50 Activity Points from the year of entry to UoM. The Activity Points earned shall be reflected on the student's eighth semester Grade Card.
- The activities can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, the minimum hours' requirement should be fulfilled.
- Activity Points (non-credit) do not affect SGPA/CGPA and shall not be considered for vertical progression.

In case students fail to earn the prescribed activity Points, an Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of the degree only after the release of the Eighth semester Grade Card.

MYSORE UNIVERSITY SCHOOL OF ENGINEERING

Scheme of Teaching and Examination 2021-2022(As per NEP-2020)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021–2022)

Artificial Intelligence and Data Science (AI&DS)

VIII-SEMESTER

Sl. No.	Course & Course Code		Course Title	Teaching Dept.	Paper Setting Board	Teaching Hours/week			Examination				Credits
						Theory lectures	Tutorial	Practical/ Drawing	Examination in Hours	CIE Marks	SEE Marks	Total Marks	
						L	T	P					
1	**Project**	**21ADP81**	Project work Phase - II	AI&DS	AI&DS	0	0	12	03	100	100	200	8
2	**Seminar**	**21ADS82**	Technical Seminar	AI&DS	AI&DS	**Two interaction hours/week between student and faculty.**			03	100		100	3
3	**INT**	**21INT83**	Summer Internship-II	**Completed during the vacation of VI and VII semesters**		**Two interaction hours/week between student and faculty.**				100		100	3
Total						**00**	**00**	**16**	**06**	**300**	**100**	**400**	**14**

Note: **AI&DS**: Artificial Intelligence and Data Science, **PROJECT:** Project work phase-II and **INT:** Internship

AICTE Activity Points: In case students fail to earn the prescribed activity Points, an Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of the degree only after the release of the Eighth semester Grade Card.

Credit Definition:
1-hour lecture(L) per week per semester = 1 Credit
2-hour tutorial (T) per week per semester = 1 Credit
2-hour Practical/Drawing (P) per week per semester = 1 Credit

Four-credit courses are to be designed for **50** hours of Teaching-Learning process.
Three credit courses are to be designed for **40** hours of Teaching-Learning process.
Two credit courses are to be designed for **25** hours of Teaching-Learning process.
One credit course is to be designed for **15** hours of Teaching-Learning process

TECHNICAL SEMINAR: The objective of the seminar is to inculcate self-learning, present the seminar topic confidently, enhance communication skill, involve in group discussion for exchange of ideas. Each student, under the guidance of a Faculty, shall choose, preferably, a recent topic of his/her interest relevant to the programme of Specialization.

- Carry out literature survey, systematically organize the content.
- Prepare the report with own sentences, avoiding a cut and paste act.
- Type the matter to acquaint with the use of Micro-soft equation and drawing tools or any such facilities.
- Present the seminar topic orally and/or through PowerPoint slides.
- Answer the queries and involve in debate/discussion.
- Submit a typed report with a list of references.

The participants shall take part in the discussion to foster a friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident

Evaluation Procedure:
The CIE marks for the seminar shall be awarded (based on the relevance of the topic, presentation skill, participation in the question and answer session, and quality of report) by the committee constituted for the purpose by the Head of the Department. The committee shall consist of three teachers from the department with the senior-most acting as the Chairman.
Marks distribution for CIE of the course:
Seminar Report:50 marks
Presentation skill:25 marks
Question and Answer: 25 marks.
No SEE component for Technical Seminar

CIE procedure for Project Work:

1) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two seniors faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the project work, shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.
2) **Interdisciplinary:** Continuous Internal Evaluation shall be group-wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work, shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.
3) **SEE procedure for Project Work:** SEE for project work will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25

Data Modeling and Visualization (21AD71)

Semester VII			
No. of Lecture hour/Week	2	**CIE Marks**	50
No. of Practical hours/week	2	**SEE Marks**	50
Total No. of Lecture hours	50	**Exam Hours**	03
L: T:P	2:2:2	**Credits**	04

Modules	Course Content	Teaching Hours
Module 1	**Data Analytics Thinking:** Knowing your data, Data preprocessing, Data cleansing and imputation, Dimensionality reduction, Data normalization and standardization. Introduction to dimensional modeling, Fact and dimension tables, Star schema vs. snowflake schema, Data warehousing concepts, Case study: designing a dimensional model for an analytics project	**10 Hours** **L(3):T(3):P(4)**
Module 2	**Introduction to Data Modeling:** Overview of data modeling concepts, Types of data models (conceptual, logical, physical), Entity-Relationship (ER) modeling, Relational database concepts, Linear regression, Logistic regression, K-nearest neighbours, K-means clustering, Performance measure, Implementation of some modelling algorithms	**10 Hours** **L(3):T(3):P(4)**
Module 3	**Data Visualization Fundamentals:** Importance of data visualization, Perception and cognition principles, Types of visualizations (bar charts, scatter plots, etc.), Choosing the right visualization for the data, Hands-on activity: creating basic visualizations using a visualization tool (e.g., matplotlib, ggplot2)	**10 Hours** **L(3):T(3):P(4)**
Module 4	**Visualization Tools and Libraries:** Overview of popular visualization tools (Tableau, Power BI, etc.), Introduction to data visualization libraries in programming languages (matplotlib, seaborn etc), Hands-on workshop: exploring different visualization tools and libraries. Interactive visualizations.	**10Hours** **L(3):T(3):P(4)**
Module 5	**Data Storytelling and Communication:** Principles of effective data storytelling, structuring a data narrative, Communicating insights to non-technical stakeholders Ethical considerations in data visualization, creating a data story presentation. **Emerging Trends in Data Modeling and Visualization** Introduction to advanced topics (big data, machine learning integration), Real-time data visualization techniques, Future directions in data modeling and visualization.	**10 Hours** **L(3):T(3):P(4)**

Course outcomes:

The students should be able to:

- Understand basic steps involved in data analysis.
- Understand basics of data modeling and various modeling algorithms.
- Understand the basics of visualizations.
- Use various visualization tools and libraries.
- Know emerging trends in data modeling and visualization

Reference Books:

1. Iresh A. Dhotre, Abhijith D. Jadhav, et,all. Data Modeling and Visualization. First edition, technical publication, 2023.
2. Kieran Healy. Data Visualization: A Practical Introduction.
3. Cole Nussbaumer Knaflic. Storytelling with Data: A data visualization guide for Business Professionals.
4. Graeme Simsion , Graham Witt. Data Modeling Essentials

Algorithms for Clustering Data (21AD72)

Semester VII			
No. of Teaching hour/Week	2	**CIE Marks**	50
No. of Tutorial hours/week	2	**SEE Marks**	50
Total No. of Lecture hours	40	**Exam Hours**	03
L:T:P	2:2:0	**Credits**	03

Modules	Course Content	Teaching Hours
Module 1	**An Introduction to Cluster Analysis:** Introduction, Common Techniques Used in Cluster Analysis, Data Types Studied in Cluster Analysis, Insights Gained from Different Variations of Cluster Analysis.	**08 Hours L(4):T(4)**
Module 2	**Advanced Cluster Analysis:** Feature Selection Methods, Probabilistic Model-Based, Distance-Based Algorithms, Density and Grid Based Methods. Leveraging Dimensionality Reduction Methods. **Clustering High-Dimensional Data:** Problems, Challenges and Major Methodologies, Subspace Clustering Methods, Bi-clustering, Dimensionality Reduction Methods and Spectral Clustering.	**08 Hours L(4):T(4)**
Module 3	**A Survey of Stream Clustering Algorithms:** Introduction, Methods Based on Partitioning Representatives, Big Data Clustering, Clustering Categorical Data, Clustering Multimedia Data, Time-Series Data Clustering, Clustering Biological Data, Network Clustering.	**08 Hours L(4):T(4)**
Module 4	**Semi supervised Clustering:** Introduction, semi supervised Grap Cuts, A Unified View of Label Propagation, semi supervised Embedding, Comparative Experimental Analysis, **Cluster Ensembles:** Theory and Applications, Clustering Validation Measures, Educational and Software Resources for Data Clustering.	**08 Hours L(4):T(4)**
Module 5	**Applications of Clustering:** Market Segmentation, Image Compression, Gene Expression Analysis, Anomaly Detection, Object Tracking, Social Network Analysis, Medical Imaging, Data Clustering in MATLAB.	**08 Hours L(4):T(4)**

Course outcomes:

At the end of the course the students will be able to:

- Understand data types and different techniques used for Cluster Analysis.
- Understand clustering high dimensional data and its analysis.
- Understand categorical, time-series, biological and network clustering.
- Understand supervised clustering and cluster ensembles.
- Apply clustering algorithms on data using different tools.

Reference Books:

1. Anil K. Jain and Richard C. Dubes. Algorithms for Clustering Data.
2. Guojun Gan, Chaoqun Ma, and Jianhong Wu. Data Clustering: Theory, Algorithms, and Applications.
3. Christian Hennig, Marina Meila, Fionn Murtagh, and Roberto Rocci. Handbook of Cluster Analysis.
4. Joachim Bähr, Mehmet Gönen, and Michael Goebe. Stream Data Mining: Algorithms and Their Applications.

Professional Elective -III/IV

Neural Network and Deep Learning(21AD731)

Semester VII			
No. of Lecture hour/Week	2	CIE Marks	50
No. of Tutorial hours/week	2	SEE Marks	50
Total No. of Lecture hours	40	Exam Hours	03
L: T:P	2:2:0	Credits	03

Modules	Course Content	Teaching Hours
Module 1	**Introduction: Overview of artificial neural networks (ANNs),** Biological Neuron- Artificial Neural Model-Perceptron and activation functions, Types of activation functions. **Architecture:** Feedforward and Feedback, Convex Sets, Convex Hull and Linear Separability, Non-Linear Separable Problem. XOR Problem, Multilayer Networks.	**08 Hours L(4):T(4)**
Module 2	**Training Neural Networks** Gradient descent and backpropagation algorithm, Optimization techniques: stochastic gradient descent, mini-batch gradient descent, Regularization methods: L1 and L2 regularization, Vanishing and exploding gradients, dropout, Introduction to TensorFlow/PyTorch.	**08 Hours L(4):T(4)**
Module 3	**Deep Learning Basics:** Multilayer perceptron (MLPs), Parameters Affecting Deep Learning, Reinforcement learning and its applications. **Convolutional Neural Networks (CNNs):** Convolutional layers and filters, Pooling layers: max pooling, average pooling, CNN architectures: LeNet, AlexNet, VGG, ResNet.	**08 Hours L(4):T(4)**
Module 4	Transfer learning and fine-tuning pre-trained CNNs, Basics of sequential data processing, RNN architecture and vanishing gradients, Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU).	**08 Hours L(4):T(4)**
Module 5	**Deep Learning Applications:** Natural Language Processing (NLP) basics, Word embeddings: Word2Vec, GloVe, Sequence-to-sequence models: Encoder-Decoder architectures, Text generation and sentiment analysis, Image captioning and visual question answering (VQA).	**08 Hours L(4):T(4)**

Course outcomes:

- Describe the basics of ANN and comparison with Human brain.
- Understand the role of neural networks in engineering, artificial intelligence, and cognitive modelling.
- Understand the concepts and techniques of neural networks.
- Evaluate whether neural networks are appropriate to a particular application.
- Apply neural networks to particular application, and to know what steps to take to improve performance.

Reference Books:

1. J.M. Zurada. Introduction to Artificial Neural Systems, Jaico Publications 1994.
2. B. Yegnanarayana, Artificial Neural Networks, Pill, New Delhi 1998.
3. Satish Kumar, Neural Networks A Classroom Approach, McGraw Hill Education, Second Edition.

Professional Elective -III/IV

Natural Language Processing (21AD732)

Semester VII			
No. of Lecture hour/Week	2	**CIE Marks**	50
No. of Tutorial hours/week	2	**SEE Marks**	50
Total No. of Lecture hours	40	**Exam Hours**	03
L: T:P	2:2:0	**Credits**	03

Modules	Course Content	Teaching Hours
Module 1	**Introduction:** Need for processing of natural languages, Language processing levels, Applications of NLP, Ambiguity and uncertainty in language, Regular Expressions, NLP tasks in syntax, semantics and pragmatics, Machine Translation.	**08 Hours L(4):T(4)**
Module 2	**Morphological Processing:** Introduction to Corpus, Tokenization, Stemming, Lemmatization Inflectional and Derivational morphology, Morphological parsing, Finite state transducers, N- gram language models, practical illustrations with NLTK, Python3, Textual sources, APIs, social media and Web Scraping, practical illustrations with NLTK, Python3, Textual sources, APIs, social media and Web Scraping.	**08 Hours L(4):T(4)**
Module 3	**Part-of-Speech Tagging**: Corpus, Tokenization, Stemming, Lemmatization, stop words and Text Features, Word Classes, Part-of-speech tagging, Tag sets, Rule-based, Stochastic and Transformation based POS tagging, TF-IDF Classification, Hidden Markov Models.	**08 Hours L(4):T(4)**
Module 4	**Large Language Models**: History and evolution of LLMs, Neural Network Architecture Building Blocks for LLMs, LLM models, Transformer Architecture, Training and Fine-tuning LLMs-Data collection, data preprocessing, and fine-tuning strategies., Transformer variants: BERT, GPT Architecture, XLNet.	**08 Hours L(4):T(4)**
Module 5	**Applications of Large Language Models**-Language translation, summarization, and paraphrasing. Exploring GPT-based applications-chatbots, content generation, and sentiment analysis, Advantages and Challenges of LLM, Ethical and Societal Implications	**08 Hours L(4):T(4)**

Course outcomes:
At the end of the course the students will be able to:

- Understand the basic terminology and theory behind underlying natural language processing.
- Understand approaches inflectional and derivational morphology and finite state transducers
- Understand approaches to part of speech tagging, parsing syntax and semantics in NLP.
- Understand basics of large language models and fine tuning LLM
- Understand the applications of BERT, GPT.

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Reference Books:

1. D. Jurafsky and J. H. Martin. Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition, Pearson Education,2008
2. J. Allen , Natural Language Understanding, Addison Wesley, 2007.
3. Vineet Chaitanya, Rajeev Sangal. Natural Language Processing - A Paninian Perspective by Akshar Bharathi.

Professional Elective -III/IV

High Performance Computing (21AD733)

Semester VII			
No. of Teaching hour/Week	2	**CIE Marks**	50
No. of Tutorial hours/week	2	**SEE Marks**	50
Total No. of Lecture hours	40	**Exam Hours**	03
L: T: P	2:2:0	**Credits**	03

Modules	Course Content	Teaching Hours
Module 1	**Parallel Programming & Computing – Introduction:** Era of Parallel Programming Platforms: Implicit Parallelism: Trends in Microprocessor Architectures, Limitations of Memory System Performance, Dichotomy of Parallel Computing Platforms, Physical Organization of Parallel Platforms, Communication Costs in Parallel Machines, Routing Mechanisms for Interconnection Networks, Impact of Process-Processor Mapping and Mapping Techniques.	**08 Hours L(4):T(4)**
Module 2	**Principles of Parallel Algorithm Design:** Preliminaries, Decomposition Techniques, Characteristics of Tasks and Interactions, Mapping Techniques for Load Balancing, Methods for Containing Interaction Overheads, Parallel Algorithm Models. **Basic Communication Operations:** One-to-All Broadcast and All-to-One Reduction, Allto-All Broadcast and Reduction, All-Reduce and Prefix-Sum Operations, Scatter and Gather, All-to-All Personalized Communication, Circular Shift, Improving the Speed of Some Communication Operations	**08 Hours L(4):T(4)**
Module 3	**Analytical Modeling of Parallel Programs:** Sources of Overhead in Parallel Programs, Performance Metrics for Parallel Systems, The Effect of Granularity on Performance, Scalability of Parallel Systems. Minimum Execution Time and Minimum Cost-Optimal Execution Time, Asymptotic Analysis of Parallel Programs Section 5.7. Other Scalability Metrics,	**08 Hours L(4):T(4)**
Module 4	**Programming Using the Message-Passing Paradigm:** Principles of Message-Passing Programming, The Building Blocks: Send and Receive Operations, MPI: the Message Passing Interface, Topologies and Embedding, Overlapping Communication with Computation, Collective Communication and Computation Operations, Groups and Communicators	**08 Hours L(4):T(4)**

Module 5	**Programming Shared Address Space Platforms:** Thread Basics, Why Threads? The POSIX Thread API, Thread Basics: Creation and Termination, Synchronization Primitives in Pthreads, Controlling Thread and Synchronization Attributes, Thread Cancellation, Composite Synchronization Constructs, Tips for Designing Asynchronous Programs, **OpenMP:A** Standard for Directive Based Parallel Programming Dense Matrix Algorithms: Matrix-Vector Multiplication, Matrix-Matrix Multiplication, Solving a System of Linear Equations	**08 Hours L(4):T(4)**

Course outcomes:

- Illustrate the key factors affecting performance of CSE applications.
- Illustrate mapping of applications to high-performance computing systems
- Apply hardware/software co-design for achieving performance on real-world applications
- Understand High Performance Computing (HPC) system architectures and various computational models.
- Apply parallel execution models and methodologies for parallel programming and parallel applications development.
- Design and implement compute intensive applications on HPC platform.
  Apply hardware/software co-design for achieving performance on real-world applications.

Reference Books:

1. Rajkumar, High Performance Cluster Computing: Architectures and Systems, Vol. 1 Pearson Education.
2. Georg Hager and Gerhard Wellein, Introduction to High Performance Computing for Scientists and Engineers, CRC Press.
3. Ananth Grama, Anshul Gupta, George Karypis, and Vipin Kumar Introduction to Parallel Computing, , 2nd edition, Addison-Welsey, 2003.
4. Grama, A. Gupta, G. Karypis, V. Kumar, An Introduction to Parallel Computing, Design and Analysis of Algorithms: 2/e, Addison-Wesley, 2003.
5. G.E. Karniadakis, R.M. Kirby II, Parallel Scientific Computing in C++ and MPI: A Seamless Approach to Parallel Algorithms and their Implementation, Cambridge University Press,2003.

Professional Elective -III/IV

Statistical Analysis (21AD734)

Semester VII			
No. of Lecture hour/Week	2	CIE Marks	50
No. of Tutorial hours/week	2	SEE Marks	50
Total No. of Lecture hours	40	Exam Hours	03
L: T:P	2:2:0	Credits	03

Modules	Course Content	Teaching Hours
Module 1	**Introduction to Statistics:** Overview of statistics and its applications, Types of data: categorical vs. numerical, Descriptive vs. inferential statistics **Descriptive Statistics:** Measures of central tendency: mean, median, mode, Measures of dispersion: range, variance, standard deviation, Measures of shape: skewness, kurtosis, Graphical representation of data: histograms, box plots, scatter plots.	08 Hours L(4):T(4)
Module 2	**Probability:** Basic concepts of probability, Probability rules and laws, Conditional probability, Probability distributions: discrete and continuous. **Random Variables and Probability Distributions** Discrete random variables, Continuous random variables, Probability mass function (PMF) and probability density function (PDF), Common probability distributions: binomial, Poisson, normal	08 Hours L(4):T(4)
Module 3	**Correlation and Regression**: Bivariate normal distribution, types, importance, methods of measuring correlation-scatter diagram, Karl Pearson's Coefficient of Correlation and Spearman's rank Correlation. Regression lines, Difference between regression and correlation, uses of Regression	08 Hours L(4):T(4)
Module 4	**Estimate and Inferential Statistics**: Estimation of parameters, Point estimation, Maximum Likelihood Estimation, Criteria for good estimators, Methods of estimation, Interval estimation, Hypothesis Testing-Parametric Tests and Non parametric tests.	08 Hours L(4):T(4)
Module 5	**Sampling Distributions and Central Limit Theorem:** Sampling methods: random sampling, stratified sampling, cluster sampling. Sampling distributions, Central Limit Theorem and its implications. **Statistical Software:** Introduction to statistical software packages (e.g., R, Python, SPSS, SAS). Data manipulation, visualization, and analysis using software tools.	08 Hours L(4):T(4)

Course outcomes:

The students should be able to:

- Build strong expertise in basics of data and its representation
- Understand basics of descriptive statistics.
- Analyse, summarize or organise data in numbers or graphs for finding corelation
- Come up with inferences or conclusion specific to population by taking some tests.
- Understand concepts of sampling theory and test of significance.

Reference Books:

1. David S. Moore, William I. Notz, and Michael A. Fligner. The Basic Practice of Statistics.
2. Sheldon M. Ross. Introduction to Probability and Statistics for Engineers and Scientists.
3. George Casella and Roger L. Berger. Statistical Inference.

Professional Elective -III/IV

Multimedia Data Analysis (21AD735)

Semester VII			
No. of Lecture hour/Week	2	**CIE Marks**	50
No. of Tutorial hours/week	2	**SEE Marks**	50
Total No. of Lecture hours	40	**Exam Hours**	03
L: T:P	2:2:0	**Credits**	03

Modules	Course Content	Teaching Hours
Module 1	**Introduction to Multimedia Data Analysis:** Overview of multimedia data types, Challenges and opportunities in multimedia analysis, Introduction to multimedia data representation and formats. **Image Processing:** Image representation and enhancement techniques, Filtering and feature extraction, Image segmentation and object detection, Image classification and recognition.	**08 Hours L(4):T(4)**
Module 2	**Video Analysis** Video representation and processing, Motion estimation and tracking, Video segmentation and summarization, Action recognition and event detection.	**08 Hours L(4):T(4)**
Module 3	**Audio Analysis** Audio representation and preprocessing, Feature extraction from audio signals, Speech recognition and audio classification, Music analysis and genre classification.	**08 Hours L(4):T(4)**
Module 4	**Multimedia Fusion and Integration** Techniques for combining information from multiple modalities, Multi-modal data representation, Fusion strategies and algorithms.	**08 Hours L(4):T(4)**
Module 5	**Deep Learning for Multimedia Analysis** Introduction to deep learning, Convolutional neural networks (CNNs) for image analysis, Recurrent neural networks (RNNs) for video and audio analysis, Transfer learning and pre-trained models. **Applications of Multimedia Data Analysis:** Multimedia content retrieval and search, Multimedia content summarization and recommendation, Multimedia forensics and security, Case studies and real-world applications.	**08 Hours L(4):T(4)**

Course outcomes:
At the end of the course the students will be able to:

- Understand basics of multimedia analysis and image processing.
- Understand video analysis process.
- Understand audio analysis process.
- Understand multimodal fusion techniques and its importance.
- Apply deep learning techniques for multimedia analysis and its applications.

Reference Books:

1. Tao Mei, Sheng Tang, and Chang Wen Chen. Multimedia Data Mining and Analytics: Disruptive Innovation.
2. R.C. Gonzalez and R.E. Woods." Digital Image Processing". 3rd Edition. Addison Wesley, 2007.
3. Richard Szeliski . Computer Vision: Algorithms and Applications. Springer 2011
4. Ian Goodfellow, Yoshua Bengio, and Aaron Courville. Deep Learning

Professional Elective -III/IV

Data Security and Privacy (21AD736)

Semester VII			
No. of Lecture hour/Week	2	CIE Marks	50
No. of Tutorial hours/week	2	SEE Marks	50
Total No. of Lecture hours	40	Exam Hours	03
L: T:P	2:2:0	Credits	03

Modules	Course Content	Teaching Hours
Module 1	**Classical Encryption Techniques** Symmetric Cipher Model, Cryptography, Cryptanalysis and Brute-Force Attack, Substitution Techniques, Caesar Cipher, Monoalphabetic Cipher, Playfair Cipher, Hill Cipher, Poly alphabetic Cipher, One Time Pad. **Block Ciphers and the data encryption standard**: Traditional block Cipher structure, stream Ciphers and block Ciphers, Motivation for the feistel Cipher structure, the feistel Cipher, The data encryption standard, DES encryption, DES decryption, A DES example, results, the avalanche effect, the strength of DES, the use of 56-Bit Keys, the nature of the DES algorithm, timing attacks, Block cipher design principles, number of rounds, design of function F, key schedule algorithm.	08 Hours L(4):T(4)
Module 2	**Public-Key Cryptography and RSA:** Principles of public-key cryptosystems. Public-key cryptosystems. Applications for public-key cryptosystems, requirements for publickey cryptosystems. Public-key cryptanalysis. The RSA algorithm, description of the algorithm, computational aspects, the security of RSA. Other Public-Key Cryptosystems: Diffiehellman key exchange, The algorithm, key exchange protocols, man in the middle attack, Elgamal Cryptographic systems, Elliptic curve arithmetic, abelian groups, elliptic curves over real numbers, elliptic curves over Zp, elliptic curves overGF(2m), Elliptic curve cryptography, Analog of Diffie-hellman key exchange, Elliptic curve encryption/ decryption, security of Elliptic curve cryptography, Pseudorandom number generation based on a asymmetric cipher	08 Hours L(4):T(4)
Module 3	**Key Management and Distribution**: Symmetric key distribution using Symmetric encryption, A key distribution scenario, Hierarchical key control, session key lifetime, a transparent key control scheme, Decentralized key control, controlling key usage, Symmetric key distribution using asymmetric encryption, simple secret key distribution, secret key distribution with confidentiality and authentication, A hybrid scheme, distribution of public keys, public announcement of public keys, publicly available directory, public key authority, public keys certificates, X-509 certificates. Certificates, X-509 version 3, Public Key infrastructure	08 Hours L(4):T(4)
Module 4	**An Introduction to privacy preserving data mining:** Privacy-Preserving Data Mining Algorithms, The Randomization	08 Hours L(4):T(4)

	Method, Group Based Anonymization.	
Module 5	Distributed Privacy-Preserving Data Mining, Privacy-Preservation of Application Results, Limitations of Privacy: The Curse of Dimensionality, Applications of Privacy-Preserving Data Mining.	**08 Hours L(4):T(4)**

Course outcomes:

The students should be able to:

- Analyse the vulnerabilities in any computing system and hence be able to design a security solution.
- Identify the security issues in the network and resolve it.
- Evaluate security mechanisms using rigorous approaches, including theoretical.
- Describe importance of data privacy, limitations and applications

Reference Books:

1. William Stallings. Cryptography and Network Security, Pearson ,7th edition.
2. Charu C. Aggarwal, Philip S Yu. Privacy Preserving Data Mining: Models and Algorithms, Kluwer Academic Publishers, 2008, ISBN 978-0-387-70991-8, DOI 10.1007/978- 0-387- 70992-5
3. Atul Kahate. Cryptography and Network Security, McGraw Hill Education, 4th Edition
4. V K Pachghare . Cryptography and Information Security,2nd edition, PHI.

Professional Elective -III/IV

Block Chain Technology(21AD737)

Semester VII			
No. of Lecture hour/Week	2	**CIE Marks**	50
No. of Tutorial hours/week	2	**SEE Marks**	50
Total No. of Lecture hours	40	**Exam Hours**	03
L: T:P	2:2:0	**Credits**	03

Modules	Course Content	Teaching Hours
Module 1	**History:** Digital Money to Distributed Ledgers -Design Primitives: Protocols, Security, Consensus, Permissions, Privacy : Block chain Architecture and Design-Basic crypto primitives: Hash, Signature -Hash chain to Block chain-Basic consensus mechanisms..	**08 Hours L(4):T(4)**
Module 2	Requirements for the consensus protocols-Proof of Work (PoW)-Scalability aspects of Block chain consensus protocols: Permissioned Block Chains-Design Goals-Consensus protocols for Permissioned Block chains.	**08 Hours L(4):T(4)**
Module 3	Decomposing the consensus process-Hyper ledger fabric components-Chain code Design and Implementation: Hyper ledger Fabric II: Beyond Chain code: fabric SDK and Front End-Hyper ledger composer tool.	**08 Hours L(4):T(4)**
Module 4	Block chain in Financial Software and Systems (FSS): - Settlements, KYC, Capital Markets-Insurance Block chain in trade/supply chain: Provenance of goods, visibility, trade/supply chain finance, invoice management/discounting.	**08 Hours L(4):T(4)**
Module 5	Block chain for Government: Digital identity, land records and other kinds of record keeping between government entities, public distribution system / social welfare systems: Block chain Cryptography: Privacy and Security on Block chain.	**08 Hours L(4):T(4)**

Course outcomes:
At the end of the course the students will be able to:

- To understand the concepts of block chain technology and state the basic concepts of block chain.
- To understand the consensus and hyper ledger fabric in block chain technology.
- Paraphrase the list of consensuses and demonstrate and interpret working of Hyper ledger Fabric.
- Implement SDK composer tool and explain the Digital identity for government.
- Block chain in finance software and government system.

Reference Books:

1. Mark Gates, Block chain: Ultimate guide to understanding block chain, bit coin, crypto currencies, smart contracts and the future of money, Wise Fox Publishing and Mark Gates 2017.
2. Salman Baset, Luc Desrosiers, Nitin Gaur, Petr Novotny, Anthony O'Dowd, Venkatraman Ramakrishna. Hands-On Block chain with Hyper ledger: Building decentralized applications with Hyperledger Fabric and Composer", 2018.
3. Bahga, Vijay Madisetti. Block chain Applications: A Hands-On Approach, Arshdeep Bahga, Vijay Madisetti publishers 2017.

Professional Elective -III/IV

Business Data Intelligence (21AD738)

Semester VII			
No. of Lecture hour/Week	2	**CIE Marks**	50
No. of Tutorial hours/week	2	**SEE Marks**	50
Total No. of Lecture hours	40	**Exam Hours**	03
L: T:P	2:2:0	**Credits**	03

Modules	Course Content	Teaching Hours
Module 1	**An Overview of Business Intelligence, Analytics, and Decision Support Information Systems:** Support for Decision Making, An Early Framework for Computerized Decision Support, The Concept of Decision Support Systems, A Framework for Business Intelligence, Business Analytics Overview, Brief Introduction to Big Data Analytics,	**08 Hours L(4):T(4)**
Module 2	**Decision Making:** Introduction and Definitions, Phases of the Decision, Making Process, The Intelligence Phase, Design Phase, Choice Phase, Implementation Phase, Decision Support Systems Capabilities, Decision Support Systems Classification, Decision Support Systems Components.	**08 Hours L(4):T(4)**
Module 3	**Neural Networks and Sentiment Analysis:** Basic Concepts of Neural Networks, Developing Neural Network-Based Systems, Illuminating the Black Box of ANN with Sensitivity, Support Vector Machines, A Process Based Approach to the Use of SVM, Nearest Neighbor Method for Prediction, Sentiment Analysis Overview, Sentiment Analysis Applications, Sentiment Analysis Process, Sentiment Analysis, Speech Analytics.	**08 Hours L(4):T(4)**
Module 4	**Model-Based Decision Making:** Decision Support Systems modeling, Structure of mathematical models for decision support, Certainty, Uncertainty, and Risk, Decision modeling with spreadsheets, Mathematical programming optimization, Decision Analysis with Decision Tables and Decision Trees, Multi-Criteria Decision Making with Pairwise Comparisons.	**08 Hours L(4):T(4)**
Module 5	**Automated Decision Systems and Expert Systems**: Automated Decision Systems, The Artificial Intelligence field, Basic concepts of Expert Systems, Applications of Expert Systems, Structure of Expert Systems, Knowledge Engineering, Development of Expert Systems.	**08 Hours L(4):T(4)**

Course outcomes:
At the end of the course the students will be able to:

- Understand the fundamentals of business intelligence and data analytics.
- Learn techniques for collecting, cleaning, and preparing data for analysis.
- Gain proficiency in using analytical tools and software for data visualization and exploration.
- Develop skills in interpreting and communicating insights derived from data analysis.
- Apply data-driven decision-making principles to real-world business scenarios

Reference Books:

1. Rick Sherman. Business Intelligence Guidebook: From Data Integration to Analytics.
2. Foster Provost and Tom Fawcett. Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking.
3. Ramesh Shardu, Duraun Delen, EfraimTurban, J.E.Aronson,Ting-Peng Liang, David King, "Business Intelligence and Analytics: System for Decision Support", 10th Edition, Pearson Global Edition, 2013

Ability Enhancement Course-III

Project Management with Git (21AEC751)

Semester VII			
No. of Lecture hour/Week	0	**CIE Marks**	50
No. of Practical hours/week	2	**SEE Marks**	00
Total No. of Lecture hours	20	**Exam Hours**	00
L: T:P	0:0:2	**Credits**	01

Modules	Course Content	Teaching Hours
Module 1	**Introduction to Version Control** Importance of version control in software development, Overview of Git and other version control systems.	**04 Hours**
Module 2	**Getting Started with Git** Installing and configuring Git, Creating a new Git repository.	**04 Hours**
Module 3	**Basic Git Concepts and Commands** Git workflow: add, commit, push, pull, Branching and merging Resolving conflicts.	**04 Hours**
Module 4	**Collaborative Development with Git** Remote repositories and Git hosting platforms (GitHub, GitLab, Bitbucket), Forking and cloning repositories, Pull requests and code review	**04 Hours**
Module 5	**Branching Strategies** Feature branching, GitFlow workflow, Release management with Git.	**04 Hours**

Course outcomes:
At the end of the course the students will be able to:

- Understand the fundamentals of version control and its importance in project management.
- Learn how to set up and configure Git for project management purposes.
- Master essential Git commands and workflows for collaboration and code management.
- Explore advanced Git features and techniques for optimizing project workflows.
- Apply Git-based project management practices to real-world scenarios.

Reference Books:

4. Scott Chacon and Ben Straub. Pro Git.
5. Supplementary reading materials and online resources

Ability Enhancement Course-III

Technical Writing using LaTeX (21AEC752)

Semester VII			
No. of Lecture hour/Week	0	**CIE Marks**	50
No. of Practical hours/week	2	**SEE Marks**	00
Total No. of Lecture hours	20	**Exam Hours**	00
L: T:P	0:0:2	**Credits**	01

Modules	Course Content	Teaching Hours
Module 1	Introduction to LaTeX, Required Components of a LaTeX Document, Typing LaTeX Commands, preparing basic document, Changing the class – article, report, Sectioning, Chapters.	**04 Hours**
Module 2	Text Formatting, Lists, Special characters, Foot note, Mathematical Formulas, Exponents and Subscripts, Above and Below, Fractions, Functions, Sums, Integrals, and Limits, Roots, Text in Math Displays, Operators &Relations, Negated Symbols, More Symbols, Mathematical equations, Equation numbering, Greek letters, working with image, Giving caption and label	**04 Hours**
Module 3	Tables, Arrays, and Lists, Constructing Arrays, Constructing Tables	**04 Hours**
Module 4	Theorems, Basic theorems and proofs, Theorem counters, Theorem styles.	**04 Hours**
Module 5	Referencing, Bibliography and citation, Journal Articles/Reports, preparing research papers and project reports, Presentations in Latex, Brief introduction to beamer, Presentation using beamer class.	**04 Hours**

Course outcomes:
At the end of the course the students will be able to:

- Understand LaTeX, a document preparation system for high-quality typesetting.
- Getting Familiarized with the features of LaTeX.
- Getting Familiarized with the features of LaTeX.
- Typesetting of complex mathematical formulae using LaTeX
- Typesetting of journal articles, technical reports, and slide presentations.
- Automatic generation of a table of contents, bibliographies, and indexes.

References:

1. Guide to LATEX, fourth edition, Helmut Kopka, Patrick W.Daly
2. https://www.overleaf.com/learn/latex/Beamer#Reference_guide
   https://mirror.niser.ac.in/ctan/macros/latex/contrib/beamer/doc/beameruserguide.pdf

Ability Enhancement Course-III

C# and .NET Framework (21AEC753)

Semester VII			
No. of Lecture hour/Week	0	**CIE Marks**	50
No. of Practical hours/week	2	**SEE Marks**	00
Total No. of Lecture hours	20	**Exam Hours**	00
L: T:P	0:0:2	**Credits**	01

Modules	Course Content	Teaching Hours
Module 1	**Introduction to C#** Understanding C#, .NET, overview of C#, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, implicit and explicit casting. .	**04 Hours**
Module 2	Constants, Arrays, Array Class, Array List, String, String Builder, Structure, Enumerations, boxing and unboxing.	**04 Hours**
Module 3	**Object Oriented Concepts:** Class, Objects, Constructors and its types, inheritance, properties, indexers, index overloading, polymorphism.	**04 Hours**
Module 4	Sealed class and methods, interface, abstract class, abstract and interface, operator overloading, delegates, events, errors and exception, Threading.	**04Hours**
Module 5	**Introduction to .NET FRAMEWORK:** Assemblies, Versioning, Attributes, reflection, viewing meta data, remoting, security in .NET, Environment Setup of .NET Core and create a small project. Teaching-Learning Process Active learning	**04 Hours**

Course outcomes:
At the end of the course the students will be able to:

- Able to explain how C# fits into the .NET platform.
- Describe the utilization of variables and constants of C#
- Use the implementation of object-oriented aspects in applications.
- Analyse and Set up Environment of .NET Core.'
- Evaluate and create a simple project application.

Reference Books:

1. Herbert Schildt. The Complete Reference: C#. 4.0, Tata McGraw Hill, 2012.
2. Christian Nagel et al. Professional C# 2012 with .NET 4.5, Wiley India, 2012.

Ability Enhancement Course-III

Data Clustering Applications (21AEC754)

Semester VII			
No. of Lecture hour/Week	0	**CIE Marks**	50
No. of Practical hours/week	2	**SEE Marks**	00
Total No. of Lecture hours	20	**Exam Hours**	00
L: T:P	0:0:2	**Credits**	01

Sl. No	Course Content	Teaching Hours
1	Demonstrate the working of K-Means clustering algorithm for customer segmentation (Market Segmentation: Grouping customers based on purchasing behaviour).	**04 Hours**
2	Demonstrate the working of Hierarchical Clustering for gene expression analysis to uncover hierarchical relationships.	**04 Hours**
3	Demonstrate the working of DBSCAN ((Density-Based Spatial Clustering of Applications with Noise) for object recognition.	**04 Hours**
4	Demonstrate the working of Fuzzy C-Means Clustering for medical imaging.	**04 Hours**
5	Demonstrate how Spectral Clustering techniques are employed in dimensionality reduction and social network analysis contexts.	**04 Hours**

Laboratory Outcomes: The student should be able to:

- Identify patterns in data and is useful for exploratory data analysis.
- Apply clustering algorithms on customer segmentation, anomaly detection, pattern recognition, and image segmentation to uncover meaningful pattern.

Course Learning Objectives:

This course will enable students to:

- Understand data types and different techniques used for Cluster Analysis.
- Understand clustering high dimensional data and its analysis.
- Understand categorical, time-series, biological and network clustering.
- Understand supervised clustering and cluster ensembles.
- Apply clustering algorithms on data using different tools.

Descriptions (if any):

1. The programs can be implemented in either JAVA or Python.
2. Data sets can be taken from standard repository.

Annexure-III

Panel of Examiners recommended by BoS for the academic year 2024-2025

Artificial Intelligence & Data Science

Internal Members

1. Dr. Ananthapadmanabha T, Director, Mysore University School of Engineering, Manasagangotri, Mysuru.
2. Dr. Sunil C, Dept. of CS&D, Mysore University School of Engineering, Manasagangotri, Mysuru.
3. Mrs. Poornima K, Dept. of AI & DS, Mysore University School of Engineering, Manasagangotri, Mysuru.
4. Ms. Poornashree Narayani S Kulakarni, Dept. of CS&D, Mysore University School of Engineering, Manasagangotri, Mysuru.
5. Dr. Sayeda Umera Alma's, Dept. of AI & DS, Mysore University School of Engineering, Manasagangotri, Mysuru
6. Mrs. Gowthami S, Dept. of AI & DS, Mysore University School of Engineering, Manasagangotri, Mysuru.
7. Mr. Santhosh Kumar K S, Dept. of AI & ML, Mysore University School of Engineering, Manasagangotri, Mysuru
8. Dr. Syed Salim, Dept. of CS & D, Mysore University School of Engineering, Manasagangotri, Mysuru.
9. Dr. B V Divyashree, Dept. of AI & ML, Mysore University School of Engineering, Manasagangotri, Mysuru.
10. Mrs. Manasa K J, Dept. of AI & ML, Mysore University School of Engineering, Manasagangotri, Mysuru.
11. Mr. Shreyas N, Dept. of CS & D, Mysore University School of Engineering, Manasagangotri, Mysuru.

Annexure-III

External Members

1. Prof. D.S. Guru, Professor, Dept. of Studies in Computer Science, University of Mysore, Mysuru.
2. Prof. H.S. Nagendraswamy, Professor, Dept. of Studies in Computer Science, University of Mysore, Mysuru.
3. Prof. Suresha S, Dept. of Studies in Computer Science, University of Mysore, Manasagangotri, Mysuru.
4. Dr. Thippeswamy, Professor and HOD, Dept. of Computer Science and Engineering, VTU, Mysuru
5. Dr. T. N. Nagabhushan, Professor, Dept. of CS & E, SJCE, Mysore.
6. Dr. Chethan H K, Professor, Dept. of Computer Science and Engineering, Maharaja Institute of Technology, Mysuru.
7. Dr. Vinutha D C, Professor & Head, Artificial Intelligence and Machine Learning, Vidyavardhaka College of Engineering, Mysuru.
8. Dr. Rajendra A B, Professor & Head, Dept. of Information Science and Engineering, Vidyavardhaka College of Engineering, Mysuru.
9. Dr. B.S. Harish, Professor, Dept. of Information Science and Engineering, SJCE Campus, JSS University, Mysuru.
10. Dr. Sharath Kumar Y H, Professor & Head, Dept. of Information Science and Engineering, Maharaja Institute of Technology, Mysuru.
11. Dr. S. Murali, Professor, Dept of IS & E, MIT, Srirangapatna, Mysuru.
12. Dr. T. Vasudev, Professor, Dept. of CS & E, MIT, Srirangapatna, Mysuru.
13. Dr. Basavaraj S Anami, Prof. & Principal, KLE College of Engineering, Hubli.
14. Dr. M.P. Pushpalatha, Professor and Head, Dept. of Computer Science and Engineering, SJCE Campus, JSS University, Mysuru.
15. Dr. Putte Gowda, Professor and Head, Dept. of Computer Science and Engineering, ATME, College of Engineering, Mysuru.
16. Dr. B S Mahananda, Professor and Head, Dept. of Computer Science and Engineering, SJCE Campus, JSS University, Mysuru.
17. Dr. Shivmurthy R C, Professor and Head, Dept. of Computer Science and Engineering, Maharaja Institute of Technology, Mysuru.

18 Dr. Naveena C, Professor, Dept. of Computer Science and Engineering, SJBIT College of Engineering, Bengaluru.

19 Dr. Vidyaraj, Professor, Dept. of CSE, NIE, Mysuru.

20 Dr. K. Raghuveer, Prof. & Head, Dept. of IS & E, NIE, Mysore.

21 Dr. Phaneendra, Professor, Dept. of CS & E, NIE, Mysore

22 Dr. Nagappa U. Bhajantri, Professor, Dept. of CS & Engg., Government Engineering College, Chamarajanagar.

23 Dr. H. N. Prakash, Professor, Department of CS & Engg., Rajiv Institute of Technology, Hassan.

24 Dr. Mohan Kumar H.P., Professor and Head, Department of CS & Engg., PESCE, Mandya,

25 Dr. G. Thippeswamy, Professor & Head, Department of CS & Engg., BMS Institute of Technology Avalahalli, Bangalore-560 064.

26 Dr. Rajeshwari D, Professor, NIEIT, Mysuru.

27 Dr. Ramesh Babu D. R., Professor, Dept. of CSE, Dayanadasagar College of Engg. Bengaluru.

28 Dr. Bhagyashree S. R., Professor and Head, Dept. of E & CE, ATME College of Engg., Mysuru.

29 Dr. Ravishankar S., Principal, Vidya Vikas College of Engg., Mysuru.

30 Dr. S.P. Shiva Prakash, Professor and Head, Dept. of Information Science and Engineering and CSBS, SJCE Campus, JSS University, Mysuru.

31 Dr. D S Vinod, Professor, Dept. of Information Science and Engineering, SJCE Campus, JSS University, Mysuru.

32 Dr. B S Mahanand, Professor, Dept. of Information Science and Engineering, SJCE Campus, JSS University, Mysuru.

33 Dr. Anil Kumar K M, Professor, Dept. of Information Science and Engineering, SJCE Campus, JSS University, Mysuru.

34 Dr. Madhu B.K, Professor and Head, Department of Computer Science, Vidya Vikas Institute of Engineering and Technology, Mysore

35 Dr. Gururaj K S, Professor and Head, Department of Computer Science, GSSSIWT, Mysore

36 Dr. Umesh D R, Professor and Head, Department of AI & ML., PESCE, Mandya,

37 Dr. Rumana Anjum, Associate Professor, Department of Computer Science, Vidya Vikas Institute of Engineering and Technology, Mysore

38 Dr. Madhusudhan H S, Associate Professor, Department of Computer Science, VVCE, Mysore

39 Dr. Rajashekar M B, Associate Professor, Department of Computer Science, GSSSIWT, Mysore

40 Dr. Vishwesh J, Associate Professor, Department of Computer Science, GSSSIWT, Mysore

41 Dr Hemanth S R, Associate Professor, Department of Computer Science, MIT, Mysore

42 Dr. Manjula S, Associate Professor, Dept. of Computer Science and Engineering, SJCE Campus, JSS University, Mysuru.

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44 Dr. K. K. Umesh, Associate Professor, Dept. of Information Science and Engineering, SJCE Campus, JSS University, Mysuru.

45 Prathibha R.J, Associate Professor, Dept. of Information Science and Engineering, SJCE Campus, JSS University, Mysuru.

46 Dr. Lokesh S., Associate Professor, Dept. of CSE, NIE College, Mysore.

47 Dr. Srinath R., Associate Professor, Department of CSE, NIE College, Mysore.

48 Dr. Sanjay, Assoc. Prof., Dept. of MCA, NIE, Mysuru.

49 Dr. Swarnalatha S L K, Associate Professor, Dept. of CSE, MIT, Thandavpura.

50 Dr. Nasreen Phatima, Associate Professor, Dept. of CSE, ATME College of Engineering, Mysuru.

51 Dr. Aditya C R, Associate Professor, Dept. of CSE, VVCE, Mysuru

52 Dr. Honnaraju B, Associate Professor, Dept. of CSE, MIT, Mysuru.

53 Dr. R. K. Bharathi, Associate Professor, Department of MCA, SJCE, Mysore.

54 Dr. H. R. Chennamma, Associate Professor, Department of MCA, SJCE, Mysore.

55 Dr. Srinath, Associate Professor, Department of CSE, SJCE, Mysore.

56 Dr. Umesh K. K., Associate Professor, Department of CSE, SJCE, Mysore.

57 Dr. Ananda Raj Ulle, Associate Professor, Department of ISE, SJCE, Mysore.

58 Dr. Shivmurthy P.M., Assistant Professor, Department of ISE, SJCE, Mysore.

59 Dr. Nagasundara K. B., Associate Professor, Department of CS & Engg. JSS Academy of Technical Education, JSS Campus, Kengeri-Uttarahalli Main Road, Bangalore - 560060.

60 Dr. Mallikarjuna P. B., Associate Professor, Department of CS & Engg. JSS Academy of Technical Education, JSS Campus, Kengeri-Uttarahalli Main Road, Bangalore - 560060.

61 Dr. Manjunath S, Senior Consultant, Samsung R & D Pvt. Ltd, Bengaluru.

62 Dr. Nagesh Poojary, Head of Computer Vision, Continental Pvt. Ltd, Bengaluru.

63 Dr. Raghunandan, Senior Consultant, HCL Pvt. Ltd, Bengaluru

64 Dr. Jagadeesh, Dept. of CS & IS, SDM. Engineering College, Dharwad.

65 Dr. Deepu Singh, Assistant Professor, Dept. of M. Tech., MIT, Mysore.

66 Dr. M C Padma, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

67 Dr. R Girisha, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

68 Dr. Nagarathna, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

69 Dr. Anitha M L, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

70 Dr. Vinay S, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

71 Dr. Veena M, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

72 Dr. Prasanna Kumar R.S, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

73 Dr. Girish Babu MC, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

74 Dr. Mohan S. D., Assistant Professor, Presidency University, Bengaluru.

75 Mr. Raghavendra Babu TM, Assistant Professor, Department of CS & Engg., PESCE, Mandya,

76 Mr. Manjunath B., Assistant Professor, Dept. of MCA., MIT, Mysore.

77 Smt. Manasa K B, Asst. Professor, NIEIT, Mysuru.

78 Smt. Shruthi B S, Asst. Professor, NIEIT, Mysuru

79 Smt. Sheetalrani, Dept. of Computer Science, Karnataka State Women's University, Vijapura.

80 Smt. Chaya P, Asst. Professor, Dept. of CSE, GSSSIETW, Mysuru.

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82 Mr. Parashivamurthy B.M, Assistant Professor, Dept. of CSE, SJCE, Mysore.

83 Mr. Siddesh, Assistant Professor, Department of MCA, SJCE, Mysore.

84 Mr. Manju N. Assistant Professor, Department of ISE, SJCE, Mysore.

85 Mr. Tejaswi K. Assistant Professor, Dept. of MCA, SJCE, Mysore.

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87 Mr. Kiran, Assistant Professor, Dept. of CSE, NIE College, Mysore.

88 Mr. Madhan Kumar G S, Asst. Professor, Dept of AI&DS, MIT, Thandavpura.

89 Mr. Mohammed salamath, Assistant professor, Dept of AI&DS, MIT, Thandavpura.

90 Mr. Mahadeva prasad Y N, Asst. Professor, Dept of AI&DS, MIT, Thandavpura.

91 Mr. Sandesh R Gowda, Assistant Professor, Department of Computer Science, ATME Mysore.

92 Dr. Harish Kumar K. S., Assistant Professor, School of computer science and engineering & information science, Presidency University, Bengaluru.

93 Sowmya M, Assistant Professor, Department of AI & ML, BNMIT, Bengaluru.

94 Dr. Vinay Kumar Venkataramana, Managing Director & CEO, IVIS Lab, Mysuru.

95 Dr. Vinay Kumar N., Senior ML Engineer (SEN NXT), Std charted Bank, Bengaluru.

96 Dr. Chethana Kumara B. M., Leading Engineer, Samsung Electromechanics, Bengaluru.

97 Mr. Venkatesh Babu, Senior Project Manager, Infosys. Ltd., Mysuru.

98 Mr. Anil K. N., Technology Lead, Infosys. Ltd., Mysuru.

99 Mrs. Sowmya Dath., Technology Analyst, Infosys. Ltd., Mysuru.

100 Mr. Devaraju, Technology Lead, Infosys. Ltd., Mysuru.

101 Mr. Harish B. K., Consultant, Infosys. Ltd., Mysuru.

102 Mr. Anil Kumar B. L., Technical Lead(Q&A), Panasonic Innovation India Center, Bengaluru.