M.Tech in Data Sciences

Program Outcomes (POs)

PO1: An ability to independently carry out research / investigation and development work to solve practical problems.

PO2: An ability to write and present a substantial technical report / document.

PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor.

Program Specific Outcomes (PSO)

PSO1: Possess broad insight, understanding and intuition of the whole process line of extracting

knowledge from data and can use this knowledge for data management, analysis, predicting and

building models.

PSO2: Apply and analyse knowledge about algorithms for statistical analysis, machine learning, data

extraction in new areas in data science.

Course out comes Cos

Batch: 2019-2021

Semester	Course Code	Course Name	Course Outcomes (COs)
I	18MTDS101	DISCRETE MATHEMATICS AND LINEAR ALGEBRA	CO1 : Recognise and identify the importance functions and algorithms and to apply permutations and combinations in probability concepts in data science.
			CO2: Demonstrate graph theory in data mining techniques.
			CO3: Employ consistent and inconsistent systems of equations by the row echelon form of the augmented matrix and to understand the importance of Euclidean space in grouping of variables.
			CO4: Describe the importance of Eigen values and Eigen vectors in data dimension reduction techniques
	18MTDS102	ADVANCES IN DATA BASE MANAGEMENT SYSTEMS	CO1: Demonstrate the concept of SQL
			CO2: Demonstrate different security management of SQL Database
			CO3: Employ different ways of SQL statements and executions
			CO4: Differentiate conditional statement for Aggregating and grouping data.
			CO5: Use the different ways to extract data from different tables in a database
	18MTDS131	R PROGRAMMING LANGUAGE	CO1: Use the core programming concepts of R language for solving problems.
			CO2:Demonstrate the uniqueness in R programming concepts and its speed to other statistical programming languages.
			CO3: Construct programs to show different options in I/O operations in R programming.
			CO4: Interpret the importance of simulation concepts in R for cross validation of the data mining techniques.
			CO5: Examine the basic concepts of statistical functions in R for the analysis.
	18MTDS132	PYTHON FOR DATA SCIENCE	CO1:Use the core programming concepts of Python Programming Language to solve problems.
			CO2:Demonstrate the Looping and

			condition statements in Python Programming Language
			CO3:Illustrate the different options in Data Management in Python Programming Language.
			CO4:Employ the data transformation technique and its need in Python Programming Language
			CO5: Illustrate advanced statistical methods in Python Programming environment.
	18MTDS133	**VISUALIZATION TECHNIQUES**	CO1: Employ Loading data and present them pictorially
			CO2: Employ the Data wrangling technique for the given data
			CO3: Illustrate the importance of visualization in time series environments.
			CO4: Demonstrate the importance of vector representation in data science.
			CO5: Interpret the customization for better representation of graphical results.
	18MTDS141	**ARTIFICIAL INTELLIGENCE**	CO1: Demonstrate the basic principles of AI
			CO2: Illustrate the different concepts of machine thinking
			CO3: Employ the modern concept in AI
			CO4: Use the concept of problem solving and thus to improve the problem-solving skill
	18MTDS142	**INTERNET OF THINGS**	CO1: Employ the Key concepts of Internet of things and Internet of Everything
			CO2: Explain the architecture view and strategy of deploying things using cloud
			CO3: Report how cloud plays an important role in IoT Infrastructure
			CO4: Classify the real time applications and future scope related to it.
	18MTDS143	**CLOUD COMPUTING**	CO1: Analyse the Cloud computing setup with its vulnerabilities and applications using different architectures.
			CO2: Design different workflows according to requirements and apply map reduce programming model.
			CO:3 Apply and design suitable Virtualization concept, Cloud Resource Management and design scheduling algorithms
			CO4: Create combinatorial auctions for cloud resources and design scheduling algorithms for computing clouds

			CO5: Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.
	18MTRM01	**Research Methodology & IPR**	CO1: Describe the writing skills to prepare a well-structured research paper or report.
			CO2: Demonstrate the key skills needed while writing literature review.
			CO3: Illustrate the principles, scope, aim of research ethics and ethical issues.
			CO4: Demonstrate the process of patenting and development.
			CO5: Dramatize the scope of Patent Rights, Licensing and transfer of technology.
			CO 6: Illustrate the new developments on IPR.
II	**18MTDS201**	**STATISTICAL INFERENCE STATISTICAL INFERENCE**	CO1: Demonstrate the different estimation methods in statistical inference.
			CO2: Illustrate the importance of maximum likelihood estimator in the parameter estimation in continuous probability distributions.
			CO3: Interpret the importance of Neyman-Pearson lemma in deciding the critical region for the hypothesis testing procedure
			CO4: Differentiate parametric and non-parametric tests for large and small samples.
	18MTDS202	**MACHINE LEARNING**	CO1: Demonstrate the different machine learning techniques and its application.
			CO2: Interpret the importance of simple linear regression in predicting new observations.
			CO3: Illustrate the importance of assumptions in estimating the parameters in simple linear regression analysis.
			CO4: Employ multiple linear regression in predictive techniques and its assumptions.
			CO5: Differentiate Logistic regression over decision tree and random forest.
	18MTDS231	**NATURAL LANGUAGE PROCESSING**	CO1: Demonstrate the basic concepts of recommender systems in data science.
			CO2: Compare the different data mining techniques used in

			recommender system.
			CO3: Differentiate content based and neighbourhood-based recommender system.
			CO4: Examine different algorithms used for Context-Aware Recommender Systems
	18MTDS232	**ARTIFICIAL NEURAL NETWORK**	CO1: Demonstrate the basic concepts of neural networks and its components.
			CO2: Examine neural network learning and adaption techniques
			CO:3Sketch bivariate statistical graphs for the better representation and interpretation.
			CO4: Use the various advanced graphs in Exploratory Data Analysis.
	18MTDS241	**DIGITAL IMAGE PROCESSING**	CO1: Discuss Basic Image Processing Techniques for Solving Real Problems.
			CO2: Implement Image Process and Analysis Algorithms.
			CO3: Create Practical Solutions to A Range Of Common Image Processing Problems And To Critically Assess The Results Of Their Solutions, Including Shortcomings
			CO4: Demonstrate aknowledge ofabroad range of Fundamental Image Processing and Image Analysis Techniques and Concepts
	18MTDS242	**SOCIAL MEDIA ANALYTICS**	CO1: Discuss the important terminologies and analytics techniques in social media analytics
			CO2: Examine the twitter data and conclude the important finding and insights of the society thought on particular issues.
			CO3: Use the Instagram profile and find out the interesting insights.
			CO 4: Employ the different techniques for Social Media Analytics applications
	18MTDS243	**PATTERN RECOGNITION**	CO1: Discuss the different Areas Where Pattern Recognition Can Offer a Solution
			CO2: Compare Strength and Limitations of Some Techniques for Classification, Regression and Density Estimation Problems
			CO3: Illustrate supervised learning algorithms used in pattern recognition research.
			CO4: Demonstrate Bayes classifier, linear discriminant analysis for solving real time problems
	18MTDS202L	**MACHINE**	CO1: Employ the simple linear

		LEARNING LAB	regression technique.
			CO2: Use the multiple linear regression technique for various applications.
			CO3: Identify the most significant predictors to develop the better fit model.
			CO4: Assess the general linear model assumption to obtain the best model for the given data.
			CO5: Differentiate between the parametric and non-parametric supervised learning techniques.
	18MTDS231L	**NATURAL LANGUAGE PROCESSING LAB**	CO1: Choose the different data pre-processing techniques for removing the space and punctuation marks, brackets from the text data.
			CO2: Employ the machine learning model on text data and interpret them.
			CO3: Choose the visualization technique to represent and understand the data efficiently.
			CO4: Examine different algorithms used for Context-Aware Recommender Systems
	18MTDS232L	**EXPLORATORY DATA ANALYSIS LAB**	CO1: To create data frame, lists, array, matrices of raw input of data.
			CO2: Choose the statistical method to measure the given data.
			CO3: Use the various advanced graphs in Exploratory Data Analysis.
			CO4: Select the suitable data visualisation technique for the graphical representation of the data.
	18MTDS233L	**ARTIFICIAL NEURAL NETWORK LAB**	CO1: Illustrate the use of neural network model to perform the training and testing on the given data.
			CO2: Use the python programming to develop Neural Network Model.
			CO3: Differentiate between the different types of Neural Network Model.
III	**18MTDS311**	**NOSQL DATABASES**	CO1: Discuss NoSQL databases
			CO2: Discuss the basic principles and design criteria of NoSQL databases
			CO3: Illustrate the comparisons among different types of NoSQL databases
			CO4: Distinguish various use cases for different NoSQL databases
			CO5: Assess data storage and processing techniques
	18MTDS312	**BIG DATA ANALYTICS ON CLOUD**	CO1: Discuss the advanced analytics concept of Big Data use cases
			CO2: Contrast different types of Cloud Services

			CO3: Demonstrate about Deploying cloud over Big Data
			CO4: Compare different available services available for Cloud Deployment
	18MTDS313	**DATA ANALYTICS USING CASSANDRA**	CO1: Discuss Cassandra concepts and the architecture
			CO2: Differentiate RDBMS and Cassandra
			CO3: Demonstratekey features of NoSQL database and CAP theorem
			CO4: simplify Install, configure and monitor Cassandra
			CO5: Demonstrate Cluster management, Indexing and Data Modelling in Cassandra
			CO6: Employ Cassandra Query Language
	18MTOE321	**BUSINESS ANALYTICS**	CO1: Demonstrate knowledge of data analytics.
			CO2: Use technical skills in predicative to support business decision-making
			CO3: Use technical skills in prescriptivemodelling to support business decision-making
			CO4 :Simplify data into clear, actionable insights
	18MTOE322	**INDUSTRIAL SAFETY**	CO1: Demonstrate knowledge of industrial safety
			CO2: Use technical skills in maintaining equipment's, building's, cleaning safety
			CO3: Take actionable insights
	18MTOE323	**COST MANAGEMENT OF ENGINEERING PROJECTS**	CO1: Demonstrate cost and time managing
			CO2: Use soft and technical tools in designing the project
			CO3: Take actionable insights
IV	**18MTCSE41**	**Project Work and Dissertation**	CO1: Demonstrate a depth of knowledge of Computer Science Engineering
			CO2: Undertake problem identification, formulation and solution
			CO3: Complete an independent research project, resulting in at least a thesis publication, and research outputs in terms of publications in high impact factor journals, conference proceedings, and patents
			CO4: Demonstrate knowledge of contemporary issues in their chosen field of research.
			CO5: Demonstrate an ability to present and defend their research work to a panel of experts.