DEPARTMENT OF INFORMATION TECHNOLOGY :: VRSEC

M.TECH-19 REGULATIONS CO-PO MAPPING

Course Code	Course Name	CO	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
19ITDS1001	**Mathematical Foundations for Data Science**										
		CO1	Analyze the need and importance of Calculus to a data scientist Understand basic mathematical concepts like calculus and linear algebra .	**1**			**3**		**2**	**1**	**1**
		CO2	Derive the probability mass and density functions of transformation of random variables				**3**				
		CO3	Apply the mathematical and probabilistic foundations of statistical inference in computing	**2**			**2**	**1**	**1**	**3**	**2**
		CO4	Interpret the results of Regression and Correlation Analysis, for forecasting , perform analysis of variance	**1**		**1**	**1**	**2**		**1**	**1**
19ITDS1002	**Machine Learning**										
		CO1	Recognize the characteristics of machine learning, binary classification	**1**	**1**	**1**	**1**			**2**	**1**
		CO2	Solve classification problems using concept learning and multiclass classification	**2**	**1**	**2**	**2**			**3**	**1**
		CO3	Apply Tree based and Linear learning models to real world problems	**2**	**1**	**2**	**2**			**3**	**1**

		CO4	Analyze Bayesian classifiers, Distance based classification and clustering algorithms	**2**	**1**	**2**	**2**			**3**	**1**
19ITDS1003	**Advanced Algorithms**										
		CO1	Analyze the Performance of algorithms using Time and Space complexities	**1**		**2**	**1**			**1**	
		CO2	Analyze operations on various types of tree data structures	**1**							**2**
		CO3	Understand graph data structure and its operations	**2**		**1**			**1**	**3**	
		CO4	Identify data structures suitable to solve novel problems.	**3**		**1**		**2**		**2**	**1**
19ITDS1014A	**Cloud Computing And Virtualization**										
		CO1	Understand the basics of cloud computing and its services	**1**						**1**	**3**
		CO2	Analyze the cloud architecture and the technologies driving virtualization	**2**			**1**	**3**		**1**	**3**
		CO3	Explore the functioning of different cloud platforms and their applications	**2**		**1**				**1**	**3**
		CO4	Identify the need of security in cloud and its mechanisms to manage the cloud environment	**2**					**3**	**1**	**3**
19ITDS2014 B	**R For Data Science**										
		CO1	Understand the semantics, data handling and control statements in R.	**1**		**2**	**3**			**2**	

		CO2	Analyze the libraries for data manipulation and conduct hypothesis tests for statistical inference.	**2**			**1**		**1**	**2**	
		CO3	Synthesize data to fit linear and nonlinear models.	**2**			**1**	**2**	**1**		**2**
		CO4	Implement clustering, optimization and data visualization using R.	**3**		**1**	**2**	**3**	**2**	**3**	**3**
19ITDS1015A	**Social And Information Network Analysis**										
		CO1	Understand the basic notation and terminology used in social network			**2**		**1**		**1**	
		CO2	Analyze the structure and balance of the social network	**2**		**3**		**1**		**2**	**1**
		CO3	Derive the similarities of people in the society and find the communities in the society.	**2**		**2**	**2**	**1**		**1**	**2**
		CO4	Apply link analysis and web search techniques for a given web application and generate recommendations	**2**		**2**	**2**	**1**		**2**	**2**
19ITDS1015B	**Optimization Techniques For Data Analysis**										
		CO1	Understand the concept of optimality criteria for various types of optimization problem	**2**			**1**		**1**	**1**	
		CO2	Analyze optimization algorithms for Linear Programming	**2**		**1**					**1**

		CO3	Solve various constrained and unconstrained nonlinear programming problems	**2**					**1**	**1**	
		CO4	Apply the modern optimization methods to provide optimal solution for a given problem.	**3**		**1**	**1**			**1**	**1**
19MTMC1026	**Research Methodology and IPR**										
		CO1	Acquire an overview of the research methodology andtechniquesto define research problem	**3**	**2**	**3**	**3**	**3**	**2**	**1**	**2**
		CO2	Review the literature and identify the problem.	**3**	**1**	**2**	**3**	**2**	**2**	**2**	**1**
		CO3	Analyze the optimum sampling techniques for collected data.	**2**	**3**	**1**	**2**	**1**	**3**	**3**	**2**
		CO4	Apply various forms of the intellectual properties for research work.	**1**	**2**	**3**	**1**	**3**	**2**	**2**	**2**
19ITDS1051	**Machine Learning Lab**										
		CO1	Implement classification problems with decision trees, support vectors	**2**		**2**	**2**			**3**	**1**
		CO2	Demonstrate Neural network, genetic algorithms	**2**		**2**	**2**			**3**	**1**

		CO3	Apply different Bayesian learning techniques	**2**		**2**	**2**			**3**	**1**
		CO4	Solve distance based supervised and unsupervised learning problems	**2**		**2**	**2**			**3**	**1**
19ITDS1052	**Python For Datascience Lab**										
		CO1	Implement python programming constructs to build small to large scale applications	**2**		**2**				**1**	**1**
		CO2	Manipulate one-dimensional and multi - dimensional Numpy arrays, and pandas series and data frames	**2**		**2**				**1**	**2**
		CO3	Perform data loading, cleaning ,transformation and merging	**2**		**2**			**2**	**2**	**2**
		CO4	Create different plots for basic exploratory data analysis	**2**		**2**		**3**	**2**	**3**	**3**
19ITDS2001	**Data Visualization**										
		CO1	Comprehend the importance of the exploratory data analysis paradigm			**1**		**1**			**1**
		CO2	Understand basic concepts of data visualization	**1**		**1**		**1**		**1**	**3**

		CO3	Select appropriate data visualization technique for given data	**1**	**3**			**3**			
		CO4	Design visualizations for presenting stories from data	**3**	**3**	**3**		**3**	**1**	**3**	
19ITDS2002	**Big Data Management**										
		CO1	Understand The Fundamental Concepts Of Big Data and HDFS.	**2**			**2**	**1**			**3**
		CO2	Solve Big Data Problems Using MapReduce, Pig And Hive.	**1**			**2**		**1**		**1**
		CO3	Use NoSQL Databases To Process Different Varieties of Data.	**1**		**1**	**2**			**1**	**2**
		CO4	Perform In Memory Data Analytics With Spark and Spark Streaming.				**1**		**3**		**3**
19ITDS2003	**Business Analytics**										
		CO1	Understand Business Analytics and manipulate data	**1**		**2**		**2**		**3**	
		CO2	Analyze the fundamental tools and methods of data analysis and statistics.	**1**			**2**			**1**	
		CO3	Develop approaches for applying forecasting techniques and data mining techniques.	**2**			**2**	**2**		**2**	**2**

		CO4	Identify, model and solve decision problems in different settings	**3**		**2**	**3**	**3**	**2**	**3**	**3**
19ITDS2014A	**Computer vision**										
		CO1	Understand and master basic knowledge, theories and methods in computer vision	**3**		**2**		**1**		**1**	
		CO2	Understand various feature extraction methods and its significance.	**2**		**1**					**1**
		CO3	Analyze various clustering and classification techniques.						**3**	**2**	**1**
		CO4	Understand and analyze Video Processing methods.	**3**		**3**		**2**		**1**	**2**
19ITDS2014B	**Deep Learning**										
		CO1	Understand basic concepts of neural networks and back propagation algorithm			**1**	**2**			**1**	**1**
		CO2	Analyze the layers in the architecture of convolution neural networks	**2**		**2**	**2**			**2**	**2**
		CO3	Acquire knowledge on auto encoders, word2vec architecture	**1**		**1**	**1**			**1**	**1**
		CO4	Explore deep learning models for sequence analysis	**3**		**2**	**2**			**2**	**2**

19ITDS2015A	**Natural Language Processing**										
		CO1	Comprehend the concepts of natural language processing, its applications and language modeling techniques	**1**			**1**			**2**	**1**
		CO2	Evaluate probabilistic language models and Solve NLP sub problems using tokenizing and tagging	**3**	**2**		**3**			**2**	**1**
		CO3	Analyze linguistic structure in text, using parsing and CFG	**3**	**2**		**2**			**2**	**1**
		CO4	Interpret Methods to recognize syntactic and semantics structures of a sentence	**3**						**2**	**1**
19ITDS2015B	**Cyber Security**										
		CO1	Identify the assets of information and significance of security.	**1**	**2**				**2**	**1**	**1**
		CO2	Apply data leakage, protection and security policies on digital systems.	**1**	**2**	**1**	**1**		**2**	**1**	**1**
		CO3	Analyse log files and backup strategies for securing the data in real time environment.	**1**	**2**	**1**	**1**		**2**	**1**	**1**
		CO4	Implement the issues in handling web vulnerabilities.	**1**	**1**				**2**	**1**	**1**

19MTAC2036	**Technical Report Writing**										
		CO1	Understand the significance of Technical Report Writing.		**3**				**1**		
		CO2	Develop proficiency in writing technical reports.		**3**				**1**	**1**	**1**
		CO3	Apply the basic principles to prepare documentation using LATEX.		**3**						
		CO4	Understanding the need of Bibliography and Reference Books for quality report writing		**3**				**2**		
19ITDS2063	**Term Paper**										
		CO1	Identify real world problems related to Data Science area							**1**	**1**
		CO2	Analyse the problems from its state of the art for arriving at feasible solutions	**3**			**1**		**2**	**2**	**2**
		CO3	Prepare an organized report employing elements of technical writing & critical thinking		**2**					**1**	**1**
		CO4	Summarize and communicate the content to audience in an effective manner		**2**				**3**		

19ITDS2051	**Big Data And Visualization Lab**										
		CO1	Implement big data analytics using Hadoop MapReduce, PIG and Spark.	**3**		**3**	**3**			**2**	
		CO2	Process Semi Structured and un Strctured data using NoSQL databases			**3**	**3**				**1**
		CO3	Construct visualizations for effective data analysis			**2**				**1**	
		CO4	Build interactive dashboards for better decision making					**2**			**2**
19ITDS2052	**Business Analytics Lab**										
		CO1	Understand the principles of business analytics	**1**		**2**		**2**		**3**	
		CO2	Predict the insights using tools and methods of data analysis and statistics.	**1**			**3**	**2**		**1**	**1**
		CO3	Develop approaches to applying forecasting and data mining techniques.	**2**			**2**	**2**		**2**	**2**
		CO4	Implement the models to solve decision problems for different applications	**3**		**2**	**3**	**3**	**2**	**3**	**3**
19ITDS3061	**Project Part-A**										
		CO1	Identify a topic in relevant areas of Data Science	**2**					**1**	**1**	**1**

		CO2	Review literature to identify gaps and define objectives & scope of the project	**2**		**1**	**1**		**1**	**1**	**1**
		CO3	Apply appropriate research methodology to provide a solution to the chosen problem	**3**		**3**	**2**	**1**		**1**	**1**
		CO4	Prepare a technical report effectively using modern tools		**3**				**3**		
19ITDS4061	**Project Part-B**										
		CO1	Identify methods and resources to carry out analysis and experiments	**2**			**1**		**1**	**1**	**1**
		CO2	Reorganize the procedures with a concern for society, environment and ethics	**1**		**1**	**1**		**1**	**1**	**1**
		CO3	Generate possible alternative solutions to chosen problem, compare, analyze them and derive performance metrics of the result	**3**		**2**	**3**	**2**	**1**	**1**	**1**
		CO4	Prepare a comprehensive report of the project work and also explore the possibility of publishing the work.		**3**	**2**		**2**	**2**		