M.L. Dahanukar College of Commerce
Teaching Plan: 2023 - 24

Department: I.T. **Class: M.Sc.(I.T.)** **Semester: I**

Subject: Data Science

Name of the Faculty: Prof. Gufran Qureshi

Month	Topics to be Covered	Internal Assessment	Number of Lectures
Oct	**Unit 1: Data Science Introduction & Basics** a. Data Science Technology Stack: Rapid Information Factory Ecosystem, Data Science Storage Tools, Data Lake, Data Vault, Data Warehouse Bus Matrix, Data Science Processing Tools ,Spark, Mesos, Akka , Cassandra, Kafka, Elastic Search, R ,Scala, Python, MQTT, The Future. b. Layered Framework: Definition of Data Science Framework, CrossIndustry Standard Process for Data Mining (CRISP-DM), Homogeneous Ontology for Recursive Uniform Schema, The Top Layers of a Layered Framework, Layered Framework for High-Level Data Science and Engineering c. Business Layer: Business Layer, Engineering a Practical Business Layer d. Utility Layer: Basic Utility Design, Engineering a Practical Utility Layer		14
Nov	**Unit 2: Statistics for Data Science** a. Three Management Layers: Operational Management Layer, Processing-Stream Definition and Management, Audit, Balance, and Control Layer, Balance, Control, Yoke Solution, Cause-and-Effect, Analysis System, Functional Layer, Data Science Process b. Retrieve Superstep: Data Lakes, Data Swamps, Training the Trainer		10

	Model, Understanding the Business Dynamics of the Data Lake, Actionable Business Knowledge from Data Lakes, Engineering a Practical Retrieve Superstep, Connecting to Other Data Sources. c. Assess Superstep: Assess Superstep, Errors, Analysis of Data, Practical Actions, Engineering a Practical Assess Superstep		
Dec	**Unit 3: Data Analysis with Python & Data Visualization** a. Process Superstep : Data Vault, Time-Person-Object-Location-Event Data Vault, Data Science Process, Data Science, b. Transform Superstep : Transform Superstep, Building a Data Warehouse, Transforming with Data Science, Hypothesis Testing, Overfitting and Underfitting, Precision-Recall, Cross-Validation Test. **Unit 4: Machine Learning for Data Science** a. Transform Superstep: Univariate Analysis, Bivariate Analysis, Multivariate Analysis, Linear Regression, Logistic Regression, Clustering Techniques, ANOVA, Principal Component Analysis (PCA), Decision Trees, Support Vector Machines, Networks, Clusters, and Grids, Data Mining, Pattern Recognition, Machine Learning,		14
Jan	Bagging Data,Random Forests, Computer Vision (CV) , Natural Language Processing (NLP), Neural Networks, TensorFlow. b. Organize and Report Supersteps : Organize Superstep, Report Superstep, Graphics, Pictures, Showing the Difference		04

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ML Dahanukar College
Teaching Plan: 2023 - 24

Department: I.T. **Class: MSc.(I.T.) Part-I** **Semester: I**

Subject: Soft Computing Techniques

Name of the Faculty: Ms. Rasika Sawant

Month	Topics to be Covered	Internal Assessment	Number of Lectures
September	**Unit I** a) Introduction of soft computing		02
October	**b)** Artificial Neural Network c) Supervised Learning Network **Unit II** a) Associative Memory Networks		22
November	b) Special Networks c) Third Generation Neural Networks d) Unsupervised Learning Networks **Unit III** a) Introduction to Fuzzy Logic, Classical Sets and Fuzzy sets b) Classical Relations and Fuzzy Relations		18
December	c) Membership Function d) Defuzzification e) Fuzzy Arithmetic and Fuzzy measures **Unit IV** a) Fuzzy Rule base and Approximate reasoning b) Genetic Algorithm		18

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ML Dahanukar College
Teaching Plan: 2023 - 24

Department: I.T. Class: *M*Sc.(I.T.) Part-I Semester: I

Subject: Cloud Computing

Name of the Faculty: Mr Dhanraj Jadhav

Month	Topics to be Covered	Internal Assessment	Number of Lectures
September	**Unit I :** Introduction to Cloud Computing - Introduction, Historical developments, Building Cloud Computing Environments, Principles of Parallel and Distributed Computing - Eras of Computing, Parallel v/s distributed computing, Elements of Parallel Computing, Elements of distributed computing, Technologies for distributed computing		10
October	Virtualization - Introduction, Characteristics of virtualized environments, Taxonomy of virtualization techniques, Virtualization and cloud computing, Pros and cons of virtualization, Technology examples. Logical Network Perimeter, Virtual Server, Cloud Storage Device, Cloud usage monitor, Resource replication, Ready-made environment.		20
November	**Unit II** Cloud Computing Architecture: Introduction, Fundamental concepts and models, Roles and boundaries, Cloud Characteristics, Cloud Delivery models, Cloud Deployment models, Economics of the cloud, Open challenges.		20
December	Fundamental Cloud Security: Basics, Threat agents, Cloud security threats, additional considerations. Industrial Platforms and New Developments: Amazon Web Services, Google App Engine, Microsoft Azure.		10

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M.L. Dahanukar College of Commerce
Teaching Plan: 2023 - 24
Department: I.T. Class: M.Sc. (I.T.) Semester: I

Subject: Image Processing

Name of the Faculty: Ms. Shruti Save

Month	Topics to be Covered	Internal Assessment	Number of Lectures
October	**Module -I** **Introduction:** Digital Image Processing, Origins of Digital Image Processing, Applications and Examples of Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System **Digital Image Fundamentals**: Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Basic Relationships Between Pixels, Basic Mathematical Tools Used in Digital Image Processing **Intensity Transformations and Spatial Filtering:** Basics, Basic Intensity Transformation Functions, Basic Intensity Transformation Functions, Histogram Processing, Fundamentals of Spatial Filtering, Smoothing (Lowpass) Spatial Filters, Sharpening (Highpass)		16
November	**Filtering in the Frequency Domain**: Background, Preliminary Concepts, Sampling and the Fourier Transform of Sampled Functions, The Discrete Fourier Transform of One Variable, Extensions to Functions of Two Variables, Properties of the 2-D DFT and IDFT, Basics of Filtering in the Frequency Domain, Image Smoothing Using Lowpass Frequency Domain Filters, Image Sharpening Using Highpass Filters, Selective Filtering **Image Restoration and Reconstruction:** A Model of the Image Degradation/Restoration Process, Noise Models, Restoration in the Presence of Noise Only-------Spatial Filtering, Periodic Noise Reduction Using Frequency Domain Filtering **Wavelet and Other Image Transforms**: Preliminaries, Matrix - based Transforms, Correlation, Basis Functions in the Time - Frequency		14

	Plane, Basis Images, Fourier -Related Transforms, Walsh -Hadamard Transforms		
December	**Module-II** **Color Image Processing**: Color Fundamentals, Color Models, Pseudocolor Image Processing, Full -Color Image Processing, Color Transformations, Color Image Smoothing and Sharpening, Using Color in Image Segmentation, Noise in Color Images, Color **Image Compression**. Image Compression and Watermarking: Fundamentals, Huffman Coding, Golomb Coding, Arithmetic Coding, LZW Coding, Run -length Coding, Symbol -based Coding, 8 Bit -plane Coding, Block Transform Coding, Predictive Coding, Wavelet Coding, Digital Image Watermarking **Morphological Image Processing:** Preliminaries, Erosion and Dilation, Opening and Closing, The Hit -or -Miss Transform, Morphological Algorithms		20
January	**Image Segmentation**: Edge Detection, Thresholding, and Region Detection: Fundamentals, Thresholding, Segmentation by Region Growing and by Region Splitting and Merging, Region Segmentation Using Clustering and Superpixels **Image Segmentation Active Contours**: Snakes and Level Sets: Background, Image Segmentation Using Snakes, Segmentation Using Level Sets. Feature Extraction: Background, Boundary Preprocessing, Boundary Feature Descriptors, Region Feature Descriptors, Principal Components as Feature Descriptors		10

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M.L. Dahanukar College of Commerce

Teaching Plan: 2023 - 24

Department: I.T. **Class: M.Sc.(I.T.) Part-I** **Semester: I**

Subject: Research Methodology

Name of the Faculty: Mr. Chayan Bhattacharjee

Month	Topics to be Covered	Internal Assessment	Number of Lectures
October	**Unit 1: a) Introduction:** Role of Business Research, Information Systems and Knowledge Management, Theory Building, Organization ethics and Issues **b) Beginning Stages of Research Process:** Problem definition, Qualitative research tools, Secondary data research		14
November	**Unit II: Research Methods and Data Collection:** Survey research, communicating with respondents, Observation methods, Experimental research		12
December	**Unit III: Measurement Concepts, Sampling and Field work:** Levels of Scale measurement, attitude measurement, questionnaire design, sampling designs and procedures, determination of sample size **Unit IV: Data Analysis and Presentation:** Editing and Coding, Basic Data Analysis		16
January	**Unit IV: Data Analysis and Presentation (cont):** Univariate Statistical Analysis and Bivariate Statistical analysis and differences between two variables. Multivariate Statistical Analysis.		18

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