3.3.3 Total number of books and chapters in edited volumes/books published and papers in national/ international conference proceedings year wise during last five years

Sr. No.	File Description	Page No.
1	Books by Authors	2

3.3.3 Total number of books and chapters in edited volumes/books published and papers in national/international conference proceedings year wise during last five years

Sr. No	Activity Name
1	Books by Author – Dr G.T. Thampi
2	Books by Author – Dr Arti Deshpande
3	Book by Author – Dr Arun Kulkarni
4	Book by Author - Dr Bhushan Jadhav
5	Book by Author- Shilpa Ingoley

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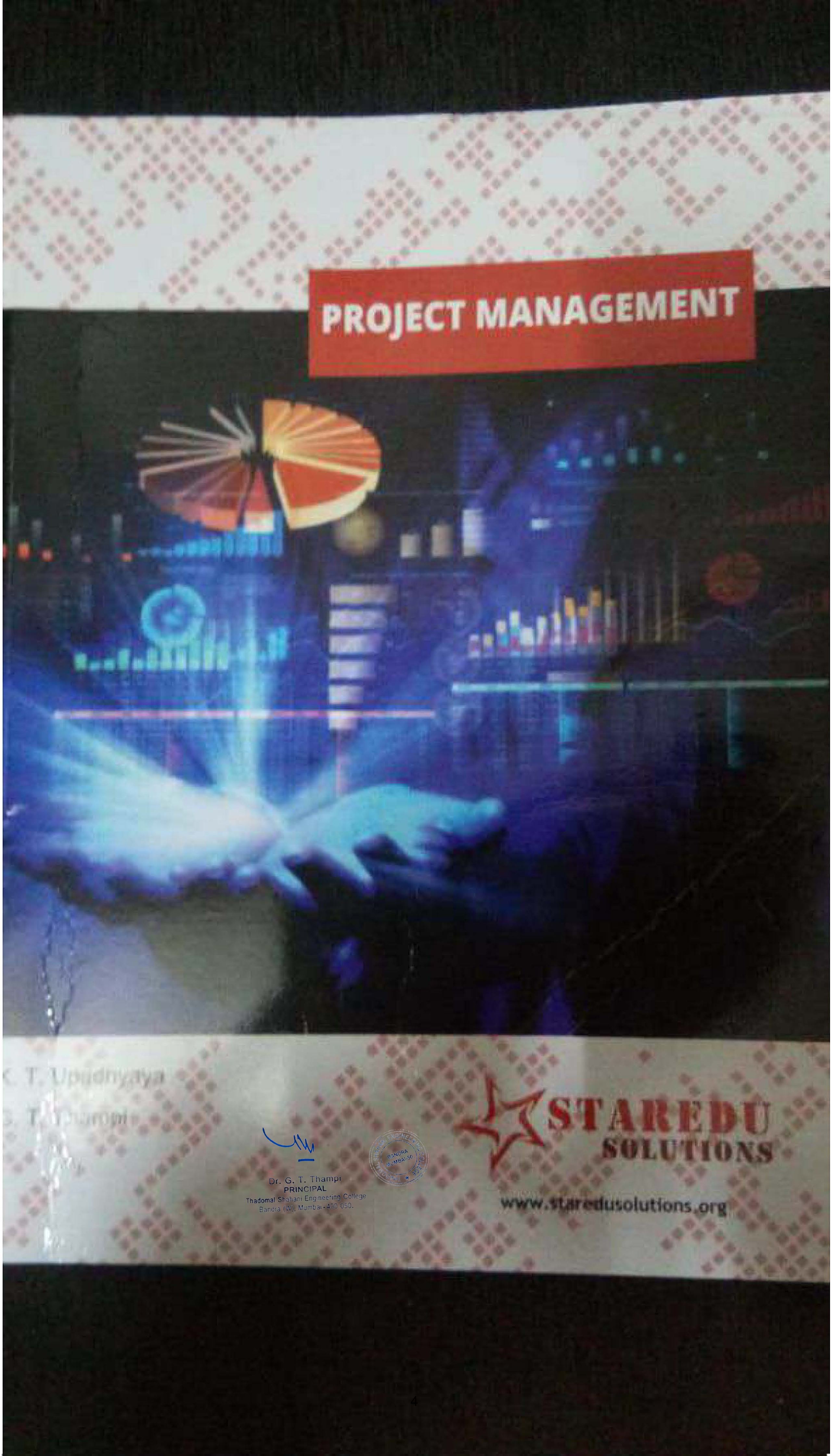

PROJECT MANAGEMENT

K. T. Upadhyaya

G. T. Thampi

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Preface

Project Management is a significant concept in the modern times. The business organisations have been established to earn profits by creating deliverables and selling them in the market. These deliverables are developed through projects. Often these projects are carried out without any management and supervision. This leads to increased costs, delayed projects and unachieved aims. Hence, the Project Management is the need of the hour.

The project completion is achieved through the coordinated efforts of the members of project teams led by the project manager. A project leader is responsible for managing all the stages of the project and garnering support from the sponsors and the management, so as to ensure that the goals of the project are achieved. Therefore, the project managers should be familiar with all the project management techniques to control the execution of the projects and deliver the intended results on time. These techniques should be revisited, reorganised and reframed, depending on the ever-changing business scenarios. Keeping this view in mind, the Project Management book has been composed, which serves as a powerful tool for enabling the students to get acquainted with the innovative concepts of project management, its techniques and its applications.

The **Project Management book** is designed to enlighten the students about the importance of project management in business organisations. The book covers all the major aspects of project management, including project life cycle, initiation of projects, project planning and scheduling, project risk management, project execution and monitoring, and project termination. After studying this book, the students will be able to comprehend and apply the various concepts of project management in real-world business scenarios, so as to gain hands-on experience.

The **Project Management book** is developed with an updated content about the different aspects of the project management. It is written in a simple, lucid and easy-to-understand language. In this book, various real-life examples have been provided in all the chapters to enable the students to gain insights into the application of project management concepts. The examples will also guide them on how to deal with the similar real-life situations and take the necessary measures.

The content of the **Project Management book** has been developed after a wide-scale research done on the subject. The book has been designed in such a way so as to enhance the understanding of the students regarding the complex issues, often faced while handling project management related concepts. The book will enable the students to gain a clear understanding and confidence of using project management techniques and lead the multitude of projects in their real lives.

About the Authors

Dr. K. T. Upadhyaya has over 17 years experience in executing large scale projects initially in Cement, Petrol chemical, Food, and Dairy industry and currently in Software development, Data Analytics and Automation projects. Dr. K. T. Upadhyaya is engaged in training in Project Management, Risk Management, Data warehousing for past 16 years. He has trained over 10,000 participants from companies in different domains and students from top B-schools in India. He also trains on Data Analytics, Supply Chain Analytics, Business Process Management, Process Automation and AI.

Dr. K. T. Upadhyaya has keen interest in relating Indian Mythology, particularly Mahabharata, to management lessons. He is an avid reader of books relating to topics ranging from Data to Fiction and everything in between. Sachin Dev Burman and Sachin Tendulkar are his two favourites in their respective domains. Dr. K. T. Upadhyaya holds a Mechanical Engineering Degree from Sardar Patel College of Engineering, Mumbai and Masters and Ph. D. from BITS Pilani. He is a Certified Project Management Professional from PMI(R), Pennsylvania, USA.

Dr. G. T. Thampi is currently The Principal at Thadomal Shahani Engineering College, Bandra, Mumbai. He hold a Ph.D Degree in Technology and has more than 33 years of experience in renowned college. Dr. G.T. Thampi has been a part of some interesting researches and holds interests in Business Process and Re-Engineering in realm of Engineering Education. Apart from his own researches he has been a guide for multiple researches done in technology front. 17 research scholars awarded Ph.D. under his guidance. Dr. Thampi is also a co-author of more than 80 research publications and books

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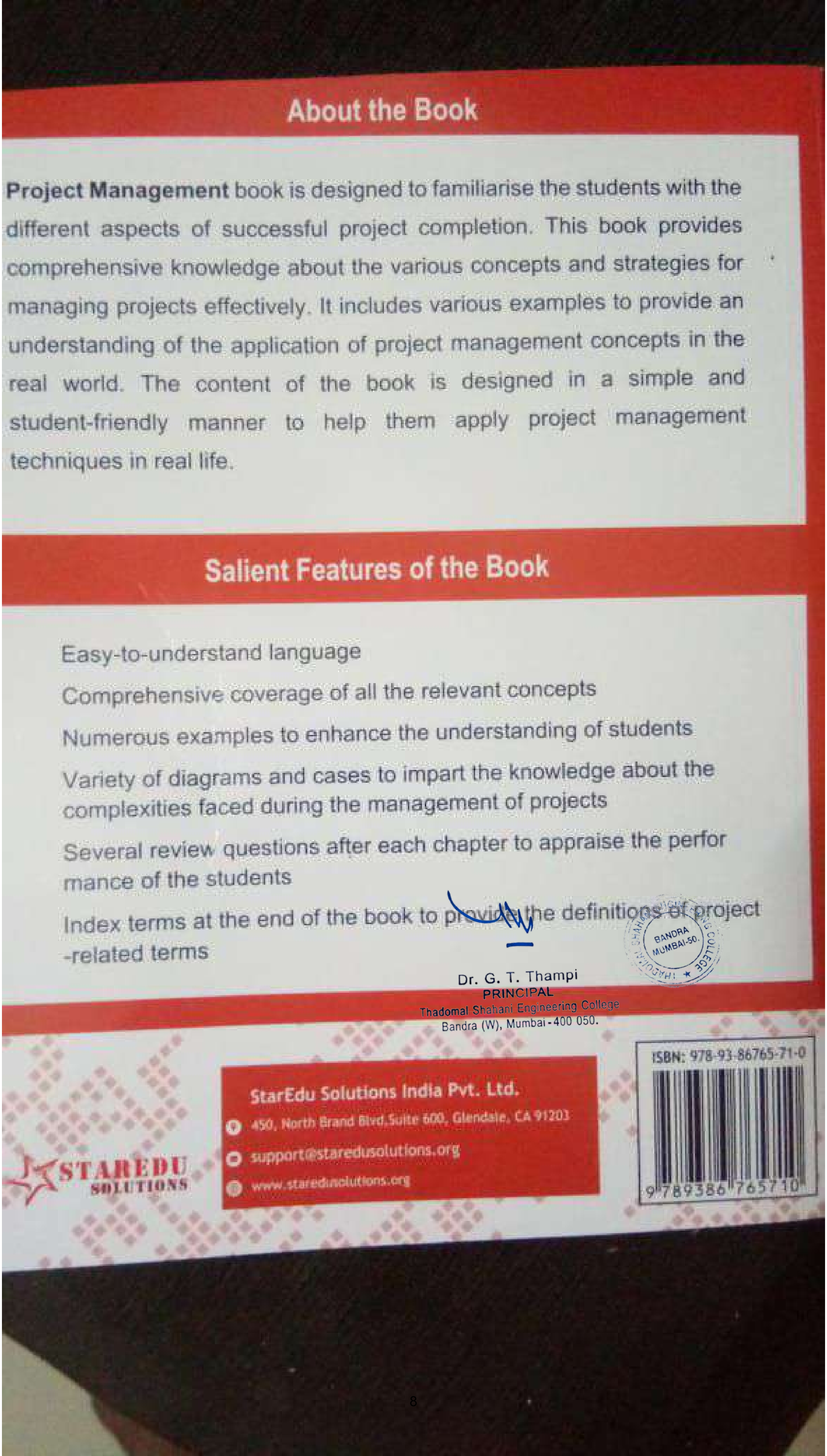

About the Book

Project Management book is designed to familiarise the students with the different aspects of successful project completion. This book provides comprehensive knowledge about the various concepts and strategies for managing projects effectively. It includes various examples to provide an understanding of the application of project management concepts in the real world. The content of the book is designed in a simple and student-friendly manner to help them apply project management techniques in real life.

Salient Features of the Book

- Easy-to-understand language
- Comprehensive coverage of all the relevant concepts
- Numerous examples to enhance the understanding of students
- Variety of diagrams and cases to impart the knowledge about the complexities faced during the management of projects
- Several review questions after each chapter to appraise the perfor mance of the students
- Index terms at the end of the book to provide the definitions of project -related terms

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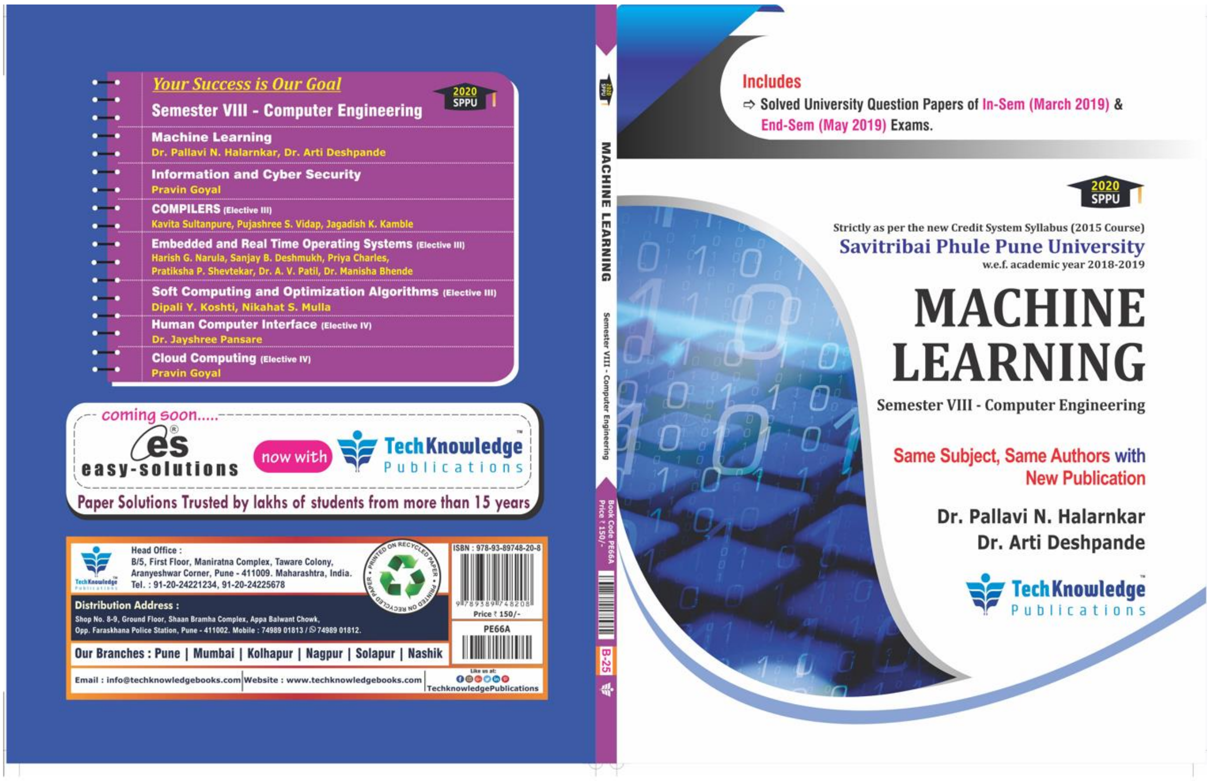

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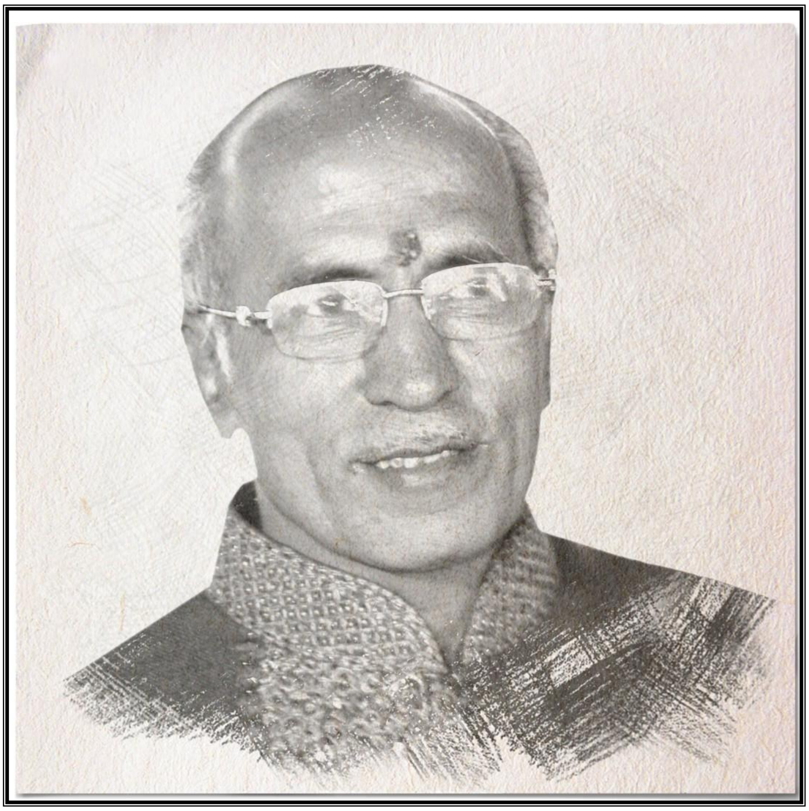
who will always be an inspiration, a positive force and strong support behind us.



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Preface

Dear students,

We are extremely happy to present the book of **"Machine Learning"** for you. We have divided the subject into small chapters so that the topics can be arranged and understood properly. The topics within the chapters have been arranged in a proper sequence to ensure smooth flow of the subject.

We present this book in the loving memory of **Late Shri. Pradeepji Lunawat,** our source of inspiration and a strong foundation of **"TechKnowledge Publications"**. He will always be remembered in our heart and motivate us to achieve our milestone.

We are thankful to Mr. Shital Bhandari, Shri. Arunoday Kumar and Shri. Chandroday Kumar for the encouragement and support that they have extended. We are also thankful to the staff members of TechKnowledge Publications and others for their efforts to make this book as good as it is. We have jointly made every possible efforts to eliminate all the errors in this book. However if you find any, please let us know, because that will help us to improve further.

We are also thankful to my family members and friends for patience and encouragement.

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Syllabus

Savitribai Phule Pune University
Fourth Year of Computer Engineering (2015 Course)

410250 : Machine Learning

Teaching Scheme : **TH : 03 Hours/Week**	**Credit** **03**	**Examination Scheme :** **In-Sem (Paper) : 30 Marks** **End-Sem (Paper) : 70 Marks**

Prerequisite Courses : 207003 - Engineering Mathematics III

Companion Course:410254 - Laboratory Practice III

Course Objectives

- To understand human learning aspects and relate it with machine learning concepts.
- To understand nature of the problem and apply machine learning algorithm.
- To find optimized solution for given problem.

Course Outcomes

On completion of the course, student will be able to -

- Distinguish different learning based applications.
- Apply different preprocessing methods to prepare training data set for machine learning.
- Design and implement supervised and unsupervised machine learning algorithm.
- Implement different learning models.
- Learn Meta classifiers and deep learning concepts.

Course Contents

Unit I : Introduction to Machine Learning **(08 Hours)**

Classic and adaptive machines, Machine learning matters, Beyond machine learning-deep learning and bio inspired adaptive systems, Machine learning and Big data.

Important Elements of Machine Learning - Data formats, Learnability, Statistical learning approaches, Elements of information theory. **(Refer chapter 1)**

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Unit II : Feature Selection **(08 Hours)**

Scikit - learn Dataset, Creating training and test sets, managing categorical data, Managing missing features, Data scaling and normalization, Feature selection and Filtering, Principle Component Analysis(PCA) - non negative matrix factorization, Sparse PCA, Kernel PCA. Atom Extraction and Dictionary Learning. **(Refer chapter 2)**

(Book Code : PE66A)

Unit III : Regression **(08 Hours)**

Linear Regression : Linear models, A bi-dimensional example, Linear Regression and higher dimensionality, Ridge, Lasso and ElasticNet, Robust regression with random sample consensus, Polynomial regression, Isotonic regression.

Logistic Regression : Linear classification, Logistic regression, Implementation and Optimizations, Stochastic gradient descendent algorithms, Finding the optimal hyper-parameters through grid search, Classification metric, ROC Curve.

(Refer chapter 3)

Unit IV : Naïve Bayes and Support Vector Machine **(08 Hours)**

Bayes´ Theorom, Naïve Bayes´ Classifiers, Naïve Bayes in Scikit - learn- Bernoulli Naïve Bayes, Multinomial Naïve Bayes, and Gaussian Naïve Bayes.

Support Vector Machine(SVM) : Linear Support Vector Machines, Scikit- learn implementation-Linear Classification, Kernel based classification, Non-linear Examples. Controlled Support Vector Machines, Support Vector Regression. **(Refer chapter 4)**

Unit V : Decision Trees and Ensemble Learning **(08 Hours)**

Decision Trees : Impurity measures, Feature Importance. Decision Tree Classification with Scikit-learn, Ensemble Learning-Random Forest, AdaBoost, Gradient Tree Boosting, Voting Classifier.

Clustering Fundamentals: Basics, K-means: Finding optimal number of clusters, DBSCAN, Spectral Clustering. Evaluation methods based on Ground Truth- Homogeneity, Completeness, Adjusted Rand Index.

Introduction to Meta Classifier : Concepts of Weak and eager learner, Ensemble methods, Bagging, Boosting, Random Forests. **(Refer chapter 5)**

Unit VI : Clustering Techniques **(08 Hours)**

Hierarchical Clustering, Expectation maximization clustering, Agglomerative Clustering-Dendrograms, Agglomerative clustering in Scikit- learn, Connectivity Constraints.

Introduction to Recommendation Systems : Naïve User based systems, Content based Systems, Model free collaborative filtering-singular value decomposition, alternating least squares.

Fundamentals of Deep Networks: Defining Deep learning, common architectural principles of deep networks, building blocks of deep networks. **(Refer chapter 6)**

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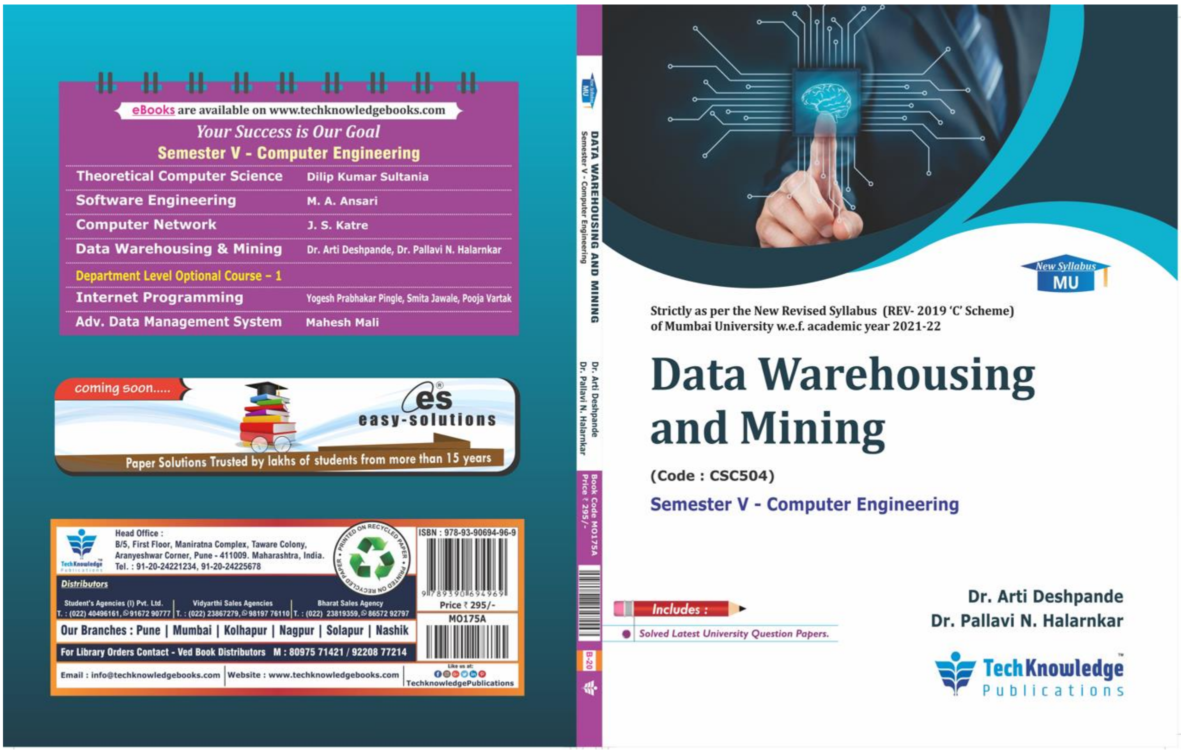

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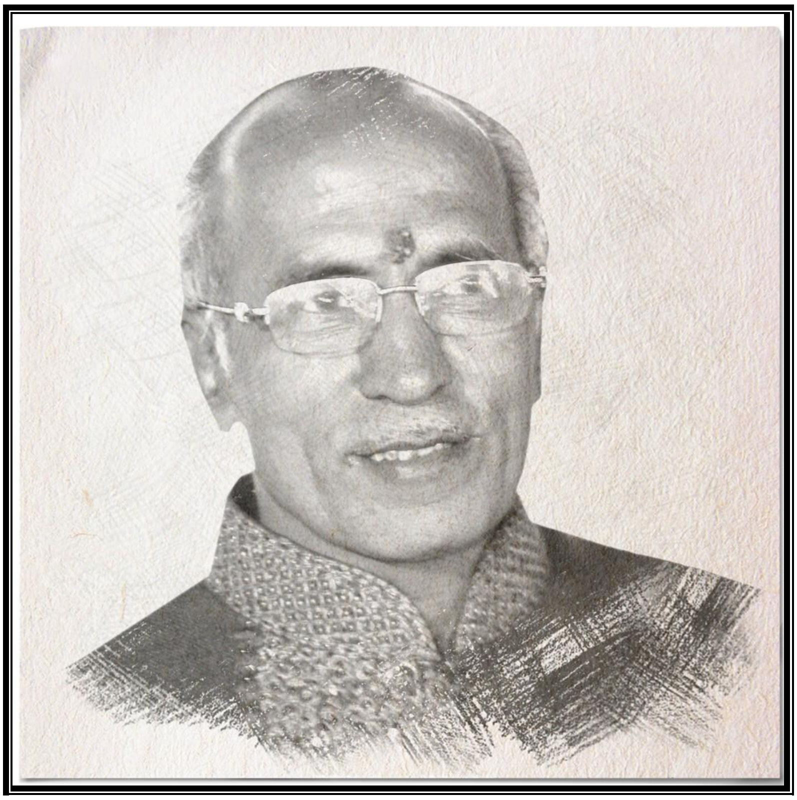

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We are extremely happy to come out with this book on **" Data Warehousing and Mining"** for you. The topics within the chapters have been arranged in a proper sequence to ensure smooth flow of the subject.

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SYLLABUS

Mumbai University
Third Year of Computer Engineering (2019 Course)

Subject Code	Subject Name	Credits
CSC504	Data Warehousing and Mining	03

Prerequisite : Database Concepts

Course Objectives :

1	To identify the significance of Data Warehousing and Mining.
2	To analyze data, choose relevant models and algorithms for respective applications.
3	To study web data mining.
4	To develop research interest towards advances in data mining.

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

1	Understand data warehouse fundamentals and design data warehouse with dimensional modelling and apply OLAP operations.
2	Understand data mining principles and perform Data preprocessing and Visualization.
3	Identify appropriate data mining algorithms to solve real world problems.
4	Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining.
5.	Describe complex information and social networks with respect to web mining

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Detailed Syllabus :

Module	Course Module / Contents	Periods
1	**Data Warehousing Fundamentals**	08
	Introduction to Data Warehouse, Data warehouse architecture, Data warehouse versus Data Marts, E-R Modeling versus Dimensional Modeling, Information Package Diagram, Data Warehouse Schemas; Star Schema, Snowflake Schema, Factless Fact Table, Fact Constellation Schema. Update to the dimension tables. Major steps in ETL process, OLTP versus OLAP, OLAP operations: Slice, Dice, Rollup, Drilldown and Pivot. **(Refer Chapter 1)**	
2	**Introduction to Data Mining, Data Exploration and Data Pre-processing**	08
	Data Mining Task Primitives, Architecture, KDD process, Issues in Data Mining, Applications of Data Mining, Data Exploration: Types of Attributes, Statistical Description of Data, Data Visualization, Data Preprocessing: Descriptive data summarization, Cleaning, Integration & transformation, Data reduction, Data Discretization and Concept hierarchy generation. **(Refer Chapter 2)**	
3	**Classification**	06
	Basic Concepts, Decision Tree Induction, Naïve Bayesian Classification, Accuracy and Error measures, Evaluating the Accuracy of a Classifier: Holdout & Random Subsampling, Cross Validation, Bootstrap. **(Refer Chapter 3)**	
4	**Clustering**	06
	Types of data in Cluster analysis, Partitioning Methods (k-Means, k-Medoids), Hierarchical Methods (Agglomerative, Divisive). **(Refer Chapter 4)**	
5	**Mining Frequent Patterns and Associations**	06
	Market Basket Analysis, Frequent Item sets, Closed Item sets, and Association Rule, Frequent Pattern Mining, Apriori Algorithm, Association Rule Generation, Improving the Efficiency of Apriori, Mining Frequent Itemsets without candidate generation, Introduction to Mining Multilevel Association Rules and Mining Multidimensional Association Rules. **(Refer Chapter 5)**	
6	**Web Mining**	05
	Introduction, Web Content Mining: Crawlers, Harvest System, Virtual Web View, Personalization, Web Structure Mining: Page Rank, Clever, Web Usage Mining **(Refer Chapter 6)**	

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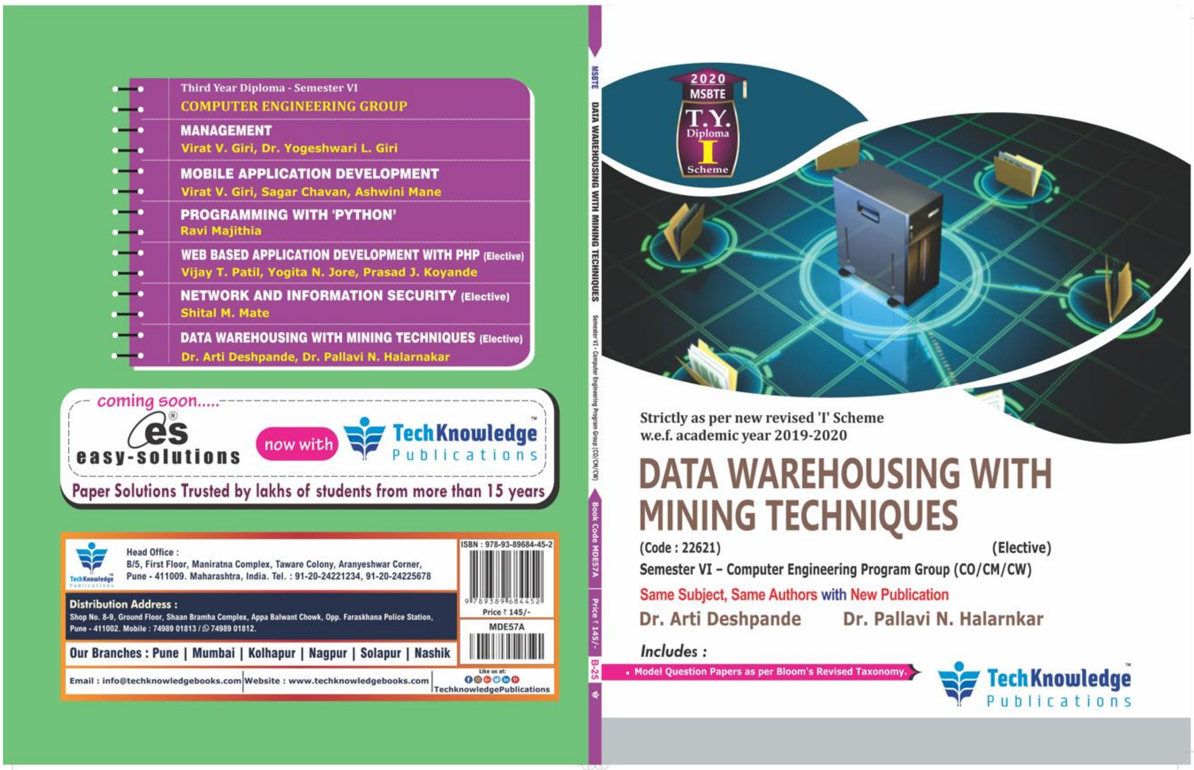

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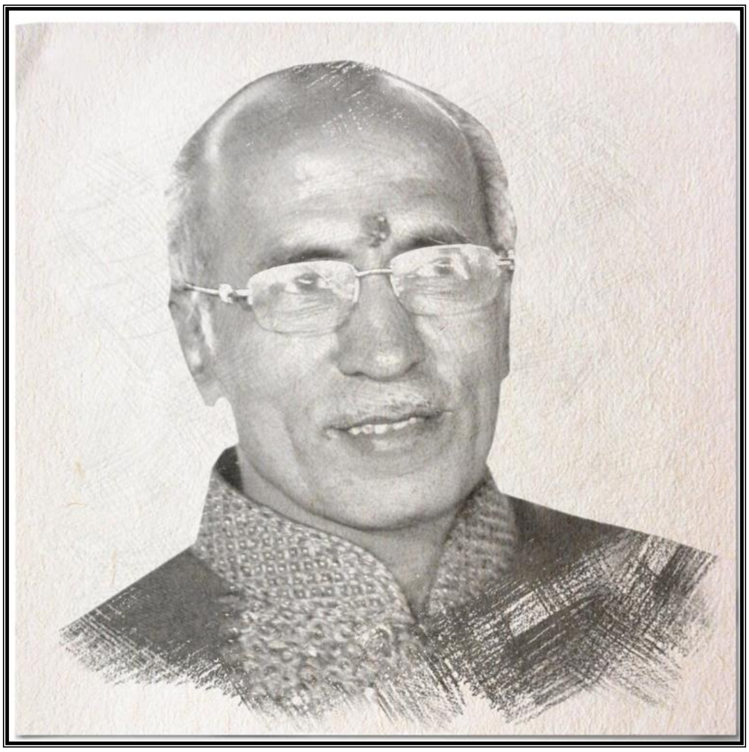

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- Authors

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Syllabus

Course Code	Course Name	Credits
CSC603	**Data Warehousing and Mining**	**4**

Course Objectives :

1. To identify the scope and essentiality of Data Warehousing and Mining.
2. To analyze data, choose relevant models and algorithms for respective applications.
3. To study spatial and web data mining.
4. To develop research interest towards advances in data mining.

Course Outcomes : On successful completion of course learner will be able to :

1. Understand Data Warehouse fundamentals, Data Mining Principles.
2. Design data warehouse with dimensional modelling and apply OLAP operations.
3. Identify appropriate data mining algorithms to solve real world problems.
4. Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining.
5. Describe complex data types with respect to spatial and web mining.
6. Benefit the user experiences towards research and innovation.

Prerequisite : Basic database concepts, Concepts of algorithm design and analysis.

Module No.	Topics	Hrs.
1.0	**Introduction to Data Warehouse and Dimensional modeling :** Introduction to Strategic Information, Need for Strategic Information, Features of Data Warehouse, Data warehouses versus Data Marts, Top-down versus Bottom-up approach. Data warehouse architecture, metadata, E-R modelling versus Dimensional Modelling, Information Package Diagram, STAR schema, STAR schema keys, Snowflake Schema, Fact Constellation Schema, Factless Fact tables, Update to the dimension tables, Aggregate fact tables.**(Refer chapter 1)**	**8**
2.0	**ETL Process and OLAP :** Major steps in ETL process, Data extraction : Techniques, Data transformation : Basic tasks, Major transformation types, Data Loading : Applying Data, OLTP Vs OLAP, OLAP definition, Dimensional Analysis, Hypercubes, OLAP operations : Drill down, Roll up, Slice, Dice and Rotation, OLAP models : MOLAP, ROLAP. **(Refer chapter 2)**	**8**

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Module No.	Topics	Hrs.
3.0	**Introduction to Data Mining, Data Exploration and Preprocessing :** Data Mining Task Primitives, Architecture, Techniques, KDD process, Issues in Data Mining, Applications of Data Mining, Data Exploration : Types of Attributes, Statistical Description of Data, Data Visualization, Data Preprocessing : Cleaning, Integration, Reduction : Attribute subset selection, Histograms, Clustering and Sampling, Data Transformation and Data Discretization : Normalization, Binning, Concept hierarchy generation, Concept Description : Attribute oriented Induction for Data Characterization. **(Refer chapter 3)**	10
4.0	**Classification, Prediction and Clustering :** Basic Concepts, Decision Tree using Information Gain, Induction : Attribute Selection Measures, Tree pruning, Bayesian Classification : Naive Bayes, Classifier Rule - Based Classification : Using IF-THEN Rules for classification, Prediction : Simple linear regression, Multiple linear regression Model Evaluation and Selection : Accuracy and Error measures, Holdout, Random Sampling, Cross Validation, Bootstrap, Clustering : Distance Measures, Partitioning Methods (k-Means, k-Medoids), Hierarchical Methods (Agglomerative, Divisive). **(Refer chapter 4)**	12
5.0	**Mining Frequent Patterns and Association Rules :** Market Basket Analysis, Frequent Item sets, Closed Item sets and Association Rule, Frequent Pattern Mining, Efficient and Scalable Frequent Item set Mining Methods : Apriori Algorithm, Association Rule Generation, Improving the Efficiency of Apriori, FP growth, Mining frequent Itemsets using Vertical Data Format, Introduction to Mining Multilevel Association Rules and Multidimensional Association Rules. **(Refer chapter 5)**	8
6.0	**Spatial and Web Mining :** Spatial Data, Spatial Vs. Classical Data Mining, Spatial Data Structures, Mining Spatial Association and Co-location Patterns, Spatial Clustering Techniques : CLARANS Extension, Web Mining : Web Content Mining, Web Structure Mining, Web Usage mining, Applications of Web Mining. **(Refer chapter 6)**	6
	Total	**52**

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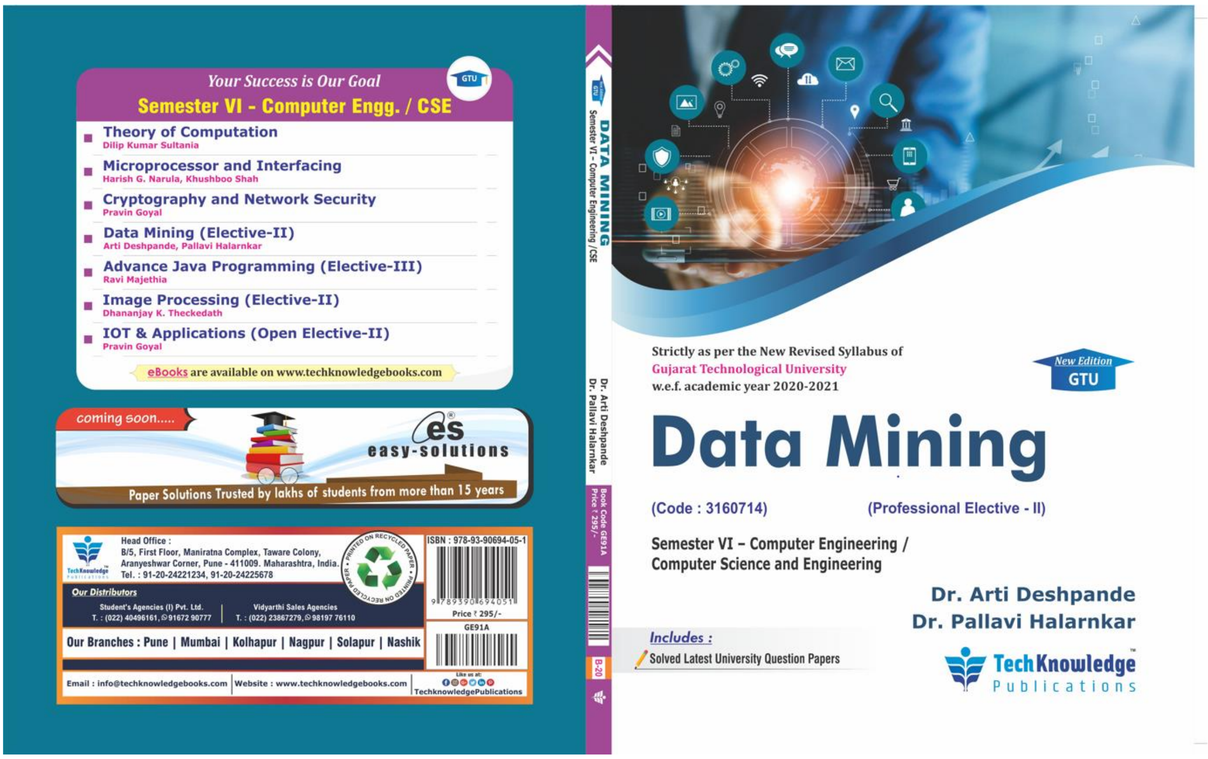

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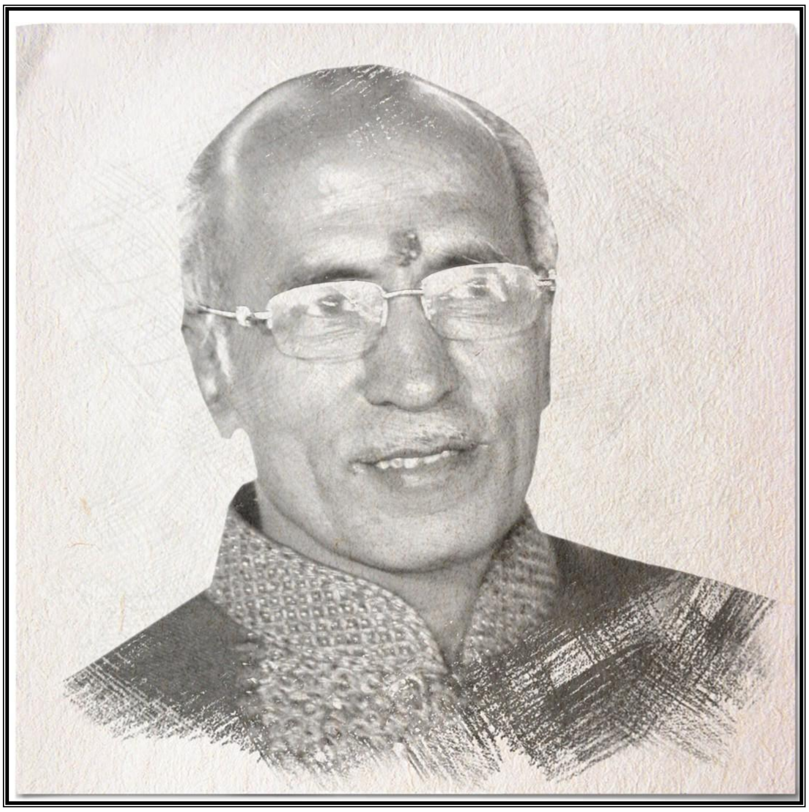

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SYLLABUS

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Sixth Semester of Computer Engineering / Computer Science and Engineering
Data Mining (Code : 3160714)

Teaching and Examination Scheme

Teaching scheme			**Credits**	**Examination Marks**				**Total Marks**
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Sr. No.	**Content**	**Total Hours**
1.	**Introduction to data mining (DM) :** Motivation for Data Mining - Data Mining-Definition and Functionalities – Classification of DM Systems - DM task primitives - Integration of a Data Mining system with a Database or a Data Warehouse - Issues in DM – KDD Process **(Refer Chapter 1)**	3
2.	**Data Pre-processing :** Data summarization, data cleaning, data integration and transformation, data reduction, data discretization and concept hierarchy generation, feature extraction, feature transformation, feature selection, introduction to Dimensionality Reduction, CUR decomposition **(Refer Chapter 2)**	4
3.	**Concept Description, Mining Frequent Patterns, Associations and Correlations :** What is concept description? - Data Generalization and summarization-based characterization - Attribute relevance - class comparisons, Basic concept, efficient and scalable frequent item-set mining methods, mining various kind of association rules, from association mining to correlation analysis, Advanced Association Rule Techniques, Measuring the Quality of Rules. **(Refer Chapter 3)**	10
4.	**Classification and Prediction :** Classification vs. prediction, Issues regarding classification and prediction, Statistical-Based Algorithms, Distance-Based Algorithms, Decision Tree-Based Algorithms, Neural Network-Based Algorithms, Rule-Based Algorithms, Combining Techniques, accuracy and error measures, evaluation of the accuracy of a classifier or predictor. Neural Network Prediction methods: Linear and nonlinear regression, Logistic Regression Introduction of tools such as DB Miner / WEKA / DTREG DM Tools **(Refer Chapter 4)**	10
5.	**Cluster Analysis :** Clustering: Problem Definition, Clustering Overview, Evaluation of Clustering Algorithms, Partitioning Clustering -K-Means Algorithm, K-Means Additional issues, PAM Algorithm; Hierarchical Clustering – Agglomerative Methods and divisive methods, Basic Agglomerative Hierarchical Clustering, Strengths and Weakness; Outlier Detection, Clustering high dimensional data, clustering Graph and Network data. **(Refer Chapter 5)**	10
8.	**Web mining and other Data Mining :** Web Mining: Introduction to Web Mining, Web content mining, Web usage mining, Web Structure mining, Web log structure and issues regarding web logs, Spatial Data Mining, Temporal Mining, And Multimedia Mining. Applications of Distributed and parallel Data Mining. **(Refer Chapter 6)**	5

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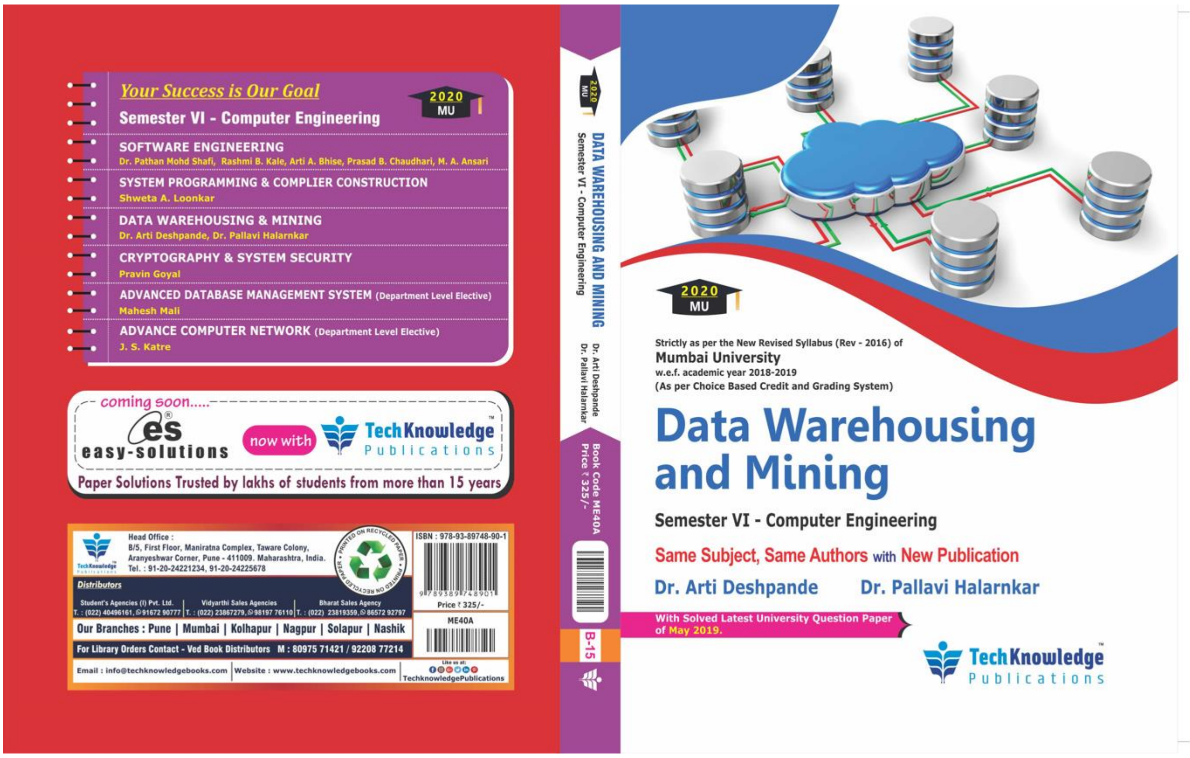

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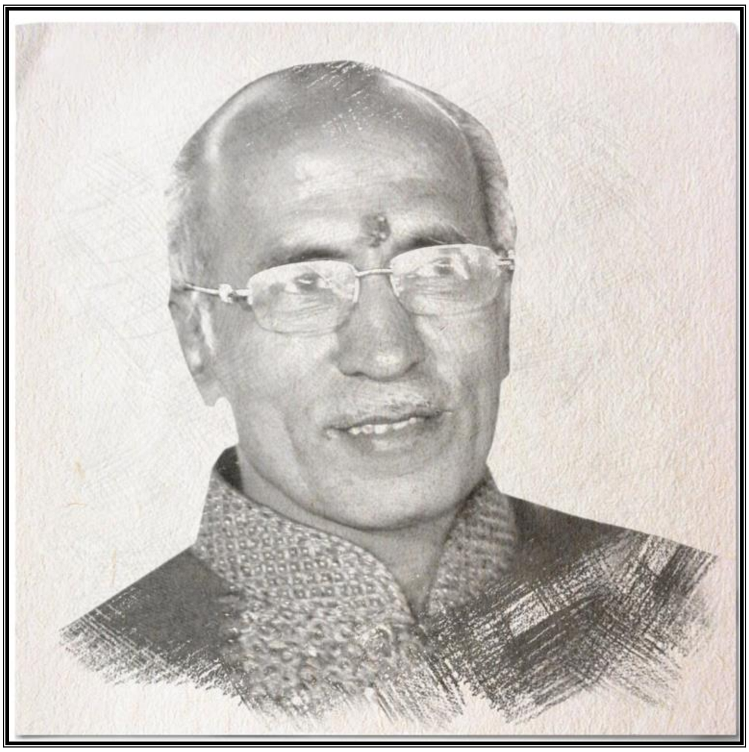

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Syllabus

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Module No.	Topics	Hrs.
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	Total	**52**

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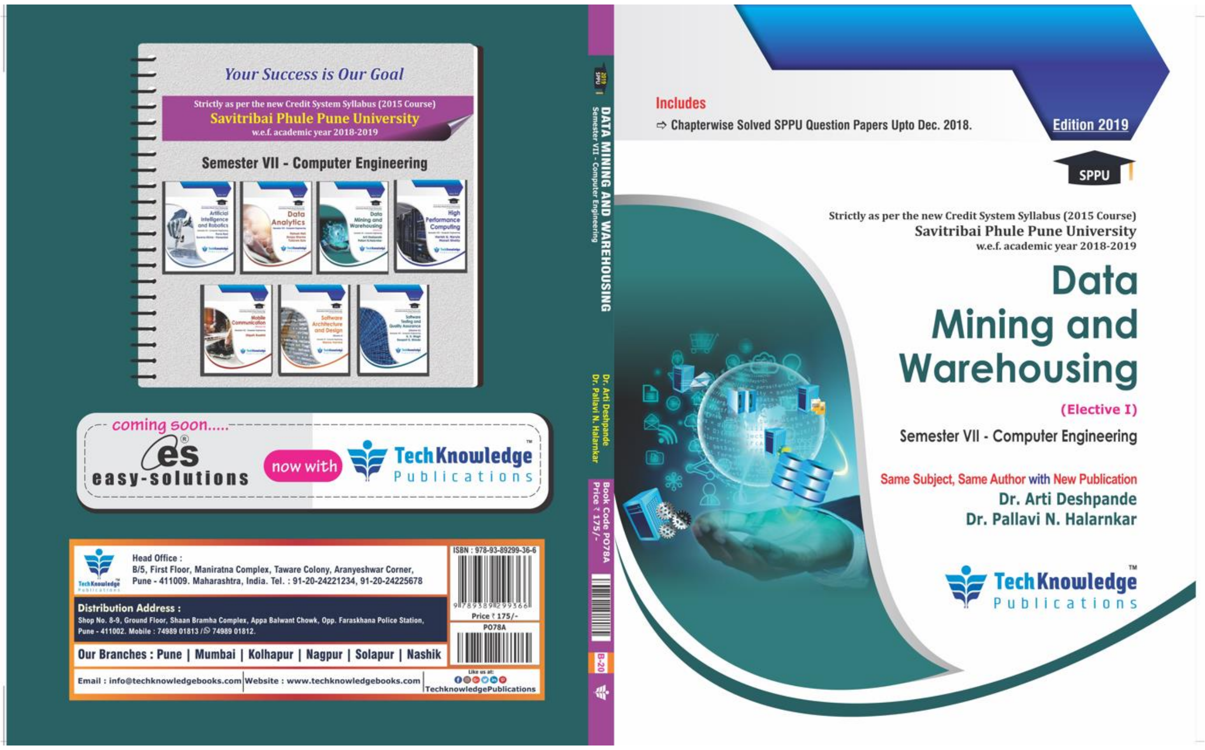

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Data Mining and Warehousing

Elective I

(Code : 410244(D))

Semester VII - Computer Engineering

(Savitribai Phule Pune University)

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Dr. Arti Deshpande, Dr. Pallavi N. Halarnkar

(Semester VII - Computer Engineering) (Savitribai Phule Pune University)

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who will always be an inspiration, a positive force and strong support

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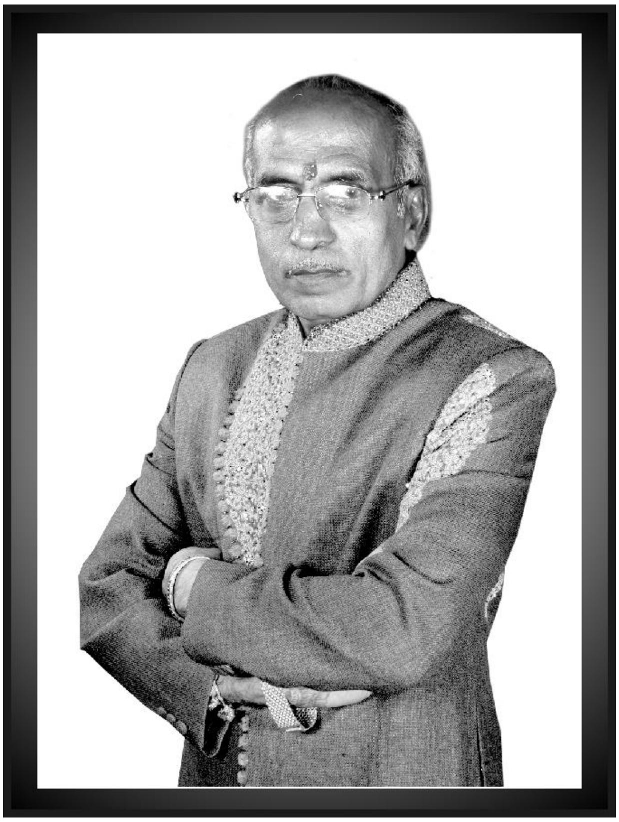

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- Dr. Arti Deshpande

- Dr. Pallavi Halarnkar

❏❏❏

Syllabus

Savitribai Phule Pune University
Fourth Year of Computer Engineering (2015 Course)
Elective I

410244(D) : Data Mining and Warehousing

Teaching Scheme : TH : 03 Hours/Week	**Credit** 03	**Examination Scheme :** In-Sem (Paper) : 30 Marks End-Sem (Paper) : 70 Marks

Pre-requisites Courses

310242-Database Management Systems, 310244 - Information Systems and Engineering Economics

Companion Course : 410247- Laboratory Practice II

Course Objectives

- To understand the fundamentals of Data Mining.
- To identify the appropriateness and need of mining the data.
- To learn the preprocessing, mining and post processing of the data.
- To understand various methods, techniques and algorithms in data mining.

Course Outcomes

On completion of the course the student should be able to :

- Apply basic, intermediate and advanced techniques to mine the data.
- Analyze the output generated by the process of data mining.
- Explore the hidden patterns in the data.
- Optimize the mining process by choosing best data mining technique.

Course Contents

Unit I : Introduction (08 Hours)

Data Mining, Data Mining Task Primitives, Data : Data, Information and Knowledge; Attribute Types : Nominal, Binary, Ordinal and Numeric attributes, Discrete versus Continuous Attributes; Introduction to Data Preprocessing, Data Cleaning : Missing values, Noisy data; Data integration : Correlation analysis; transformation : Min-max normalization, z-score normalization and decimal scaling; data reduction : Data Cube Aggregation, Attribute Subset Selection, sampling; and Data Discretization : Binning, Histogram Analysis **(Refer chapter 1)**

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Unit II : Data Warehouse (08 Hours)

Data Warehouse, Operational Database Systems and Data Warehouses (OLTP Vs OLAP), A Multidimensional Data Model: Data Cubes, Stars, Snowflakes, and Fact Constellations Schemas; OLAP Operations in the Multidimensional Data Model, Concept Hierarchies, Data Warehouse Architecture, The Process of Data Warehouse Design, A three-tier data warehousing architecture, Types of OLAP Servers : ROLAP versus MOLAP versus HOLAP. **(Refer chapter 2)**

Unit III : Measuring Data Similarity and Dissimilarity (08 Hours)

Measuring Data Similarity and Dissimilarity, Proximity Measures for Nominal Attributes and Binary Attributes, interval scaled; Dissimilarity of Numeric Data : Minskowski Distance, Euclidean distance and Manhattan distance; Proximity Measures for Categorical, Ordinal Attributes, Ratio scaled variables; Dissimilarity for Attributes of Mixed Types, Cosine Similarity. **(Refer chapter 3)**

Unit IV : Association Rules Mining (08 Hours)

Market basket Analysis, Frequent item set, Closed item set, Association Rules, a-priori Algorithm, Generating Association Rules from Frequent Item sets, Improving the Efficiency of a-priori, Mining Frequent Item sets without Candidate Generation : FP Growth Algorithm; Mining Various Kinds of Association Rules : Mining multilevel association rules, constraint based association rule mining, Meta rule-Guided Mining of Association Rules.

(Refer chapter 4)

Unit V : Classification (08 Hours)

Introduction to : Classification and Regression for Predictive Analysis, Decision Tree Induction, Rule-Based Classification : using IF-THEN Rules for Classification, Rule Induction Using a Sequential Covering Algorithm. Bayesian Belief Networks, Training Bayesian Belief Networks, Classification Using Frequent Patterns, Associative Classification, Lazy Learners-k-Nearest-Neighbor Classifiers, Case-Based Reasoning. **(Refer chapter 5)**

Unit VI : Multiclass Classification (08 Hours)

Multiclass Classification, Semi-Supervised Classification, Reinforcement learning, Systematic Learning, Wholistic learning and multi-perspective learning. Metrics for Evaluating Classifier Performance : Accuracy, Error Rate, precision, Recall, Sensitivity, Specificity; Evaluating the Accuracy of a Classifier : Holdout Method, Random Sub sampling and Cross-Validation. **(Refer chapter 6)**

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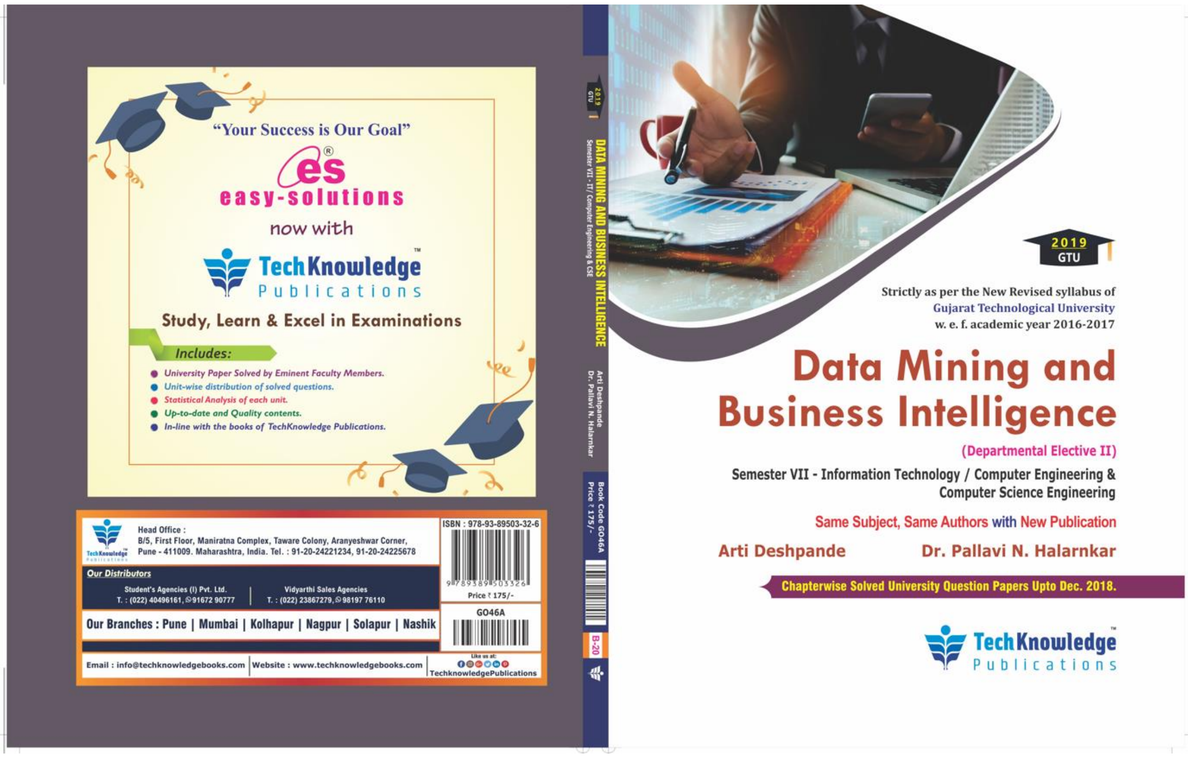

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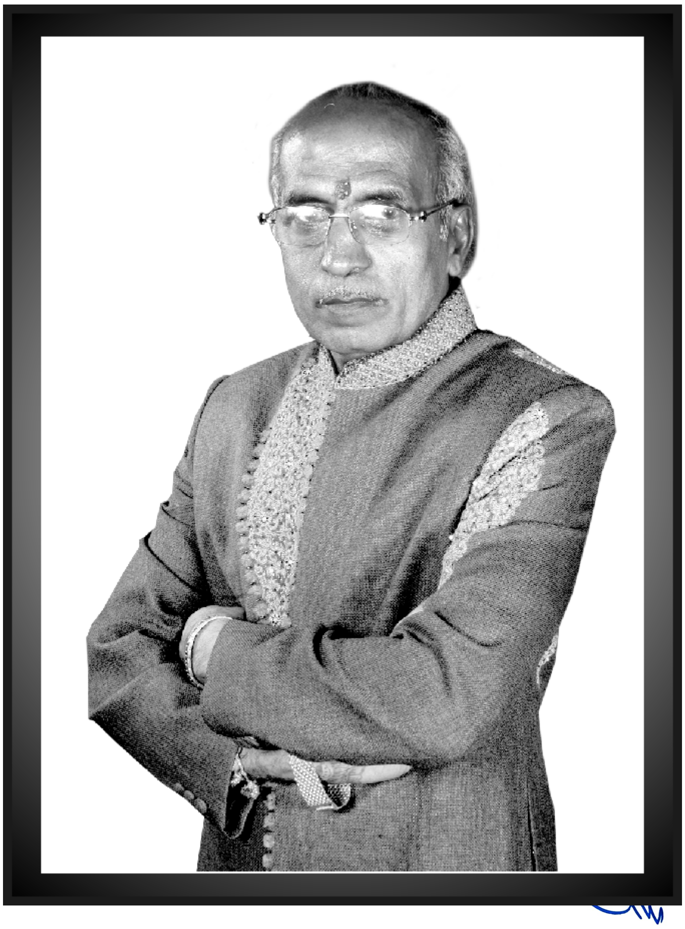

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– Arti Deshpande

– Pallavi N. Halankar

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Syllabus

Unit 1 : Overview and concepts Data Warehousing and Business Intelligence :

Why reporting and Analysing data, Raw data to valuable information-Lifecycle of Data - What is Business Intelligence - BI and DW in today's perspective - What is data warehousing - The building Blocks : Defining Features - Data warehouses and data 1marts - Overview of the components - Metadata in the data warehouse - Need for data warehousing - Basic elements of data warehousing - trends in data warehousing. **(Refer Chapter 1)**

Unit 2 : The Architecture of BI and DW :

BI and DW architectures and its types - Relation between BI and DW - OLAP (Online analytical processing) definitions - Difference between OLAP and OLTP - Dimensional analysis - What are cubes? Drill-down and roll-up - slice and dice or rotation - OLAP models - ROLAP versus MOLAP - defining schemas : Stars, snowflakes and fact constellations. **(Refer Chapter 2)**

Unit 3 : Introduction to data mining (DM) :

Motivation for Data Mining - Data Mining-Definition and Functionalities – Classification of DM Systems - DM task primitives - Integration of a Data Mining system with a Database or a Data Warehouse - Issues in DM – KDD Process. **(Refer Chapter 3)**

Unit 4 : Data Pre-processing :

Why to pre-process data? - Data cleaning: Missing Values, Noisy Data - Data Integration and transformation - Data Reduction : Data cube aggregation, Dimensionality reduction - Data Compression - Numerosity Reduction - Data Mining Primitives - Languages and System Architectures : Task relevant data - Kind of Knowledge to be mined - Discretization and Concept Hierarchy. **(Refer Chapter 4)**

Unit 5 : Concept Description and Association Rule Mining :

What is concept description? - Data Generalization and summarization-based characterization - Attribute relevance - class comparisons Association Rule Mining: Market basket analysis – basic concepts - Finding frequent item sets: Apriori algorithm - generating rules – Improved Apriori algorithm – Incremental ARM – Associative Classification – Rule Mining. **(Refer Chapter 5)**

Unit 6 : Classification and Prediction :

What is classification and prediction? – Issues regarding Classification and prediction :

Classification methods : Decision tree, Bayesian Classification, Rule based, CART, Neural Network

Prediction methods : Linear and nonlinear regression, Logistic Regression

Introduction of tools such as DB Miner /WEKA/DTREG DM Tools. **(Refer Chapter 6)**

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Unit 7 : Data Mining for Business Intelligence Applications :

Data mining for business Applications like Balanced Scorecard, Fraud Detection, Click stream Mining, Market Segmentation, retail industry, telecommunications industry, banking & finance and CRM etc.

Data Analytics Life Cycle : Introduction to Big data Business Analytics - State of the practice in analytics role of data scientists

Key roles for successful analytic project : Main phases of life cycle - Developing core deliverables for stakeholders. **(Refer Chapter 7)**

Unit 8 : Advance topics :

Introduction and basic concepts of following topics.

Clustering, Spatial mining, web mining, text mining,

Big Data : Introduction to big data : distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce. Introduction to Hadoop architecture: Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers – Cluster Setup – SSH & Hadoop Configuration – HDFS Administering – Monitoring & Maintenance. **(Refer Chapter 8)**

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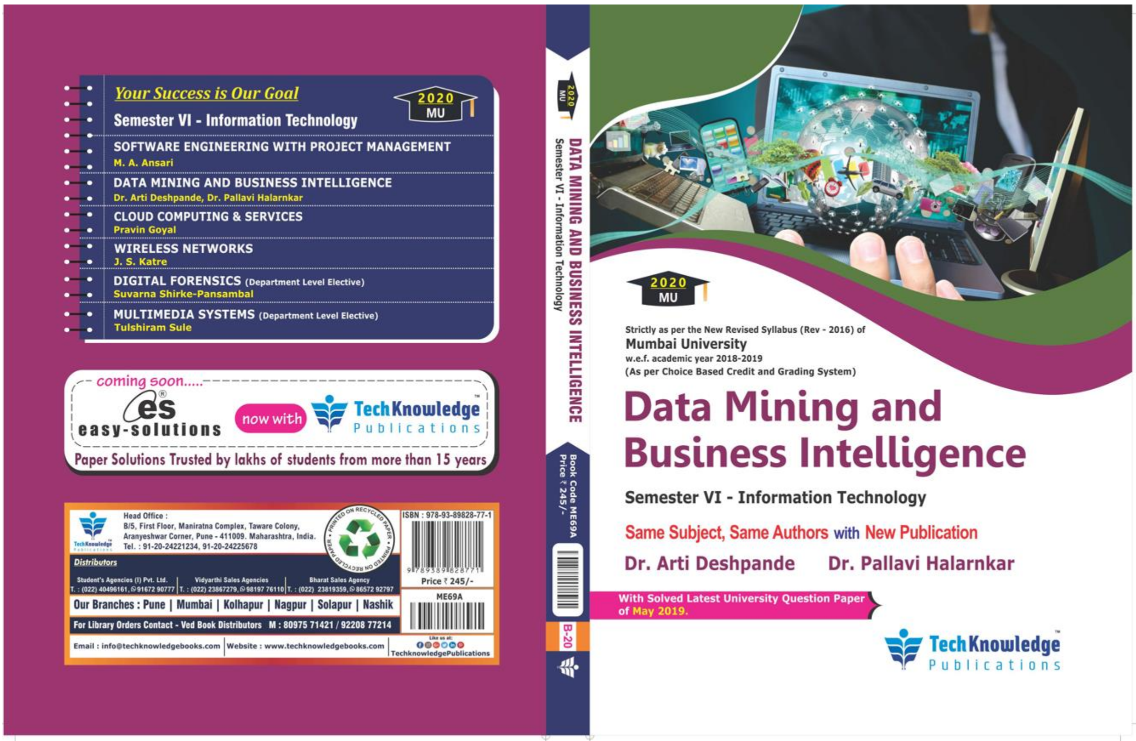
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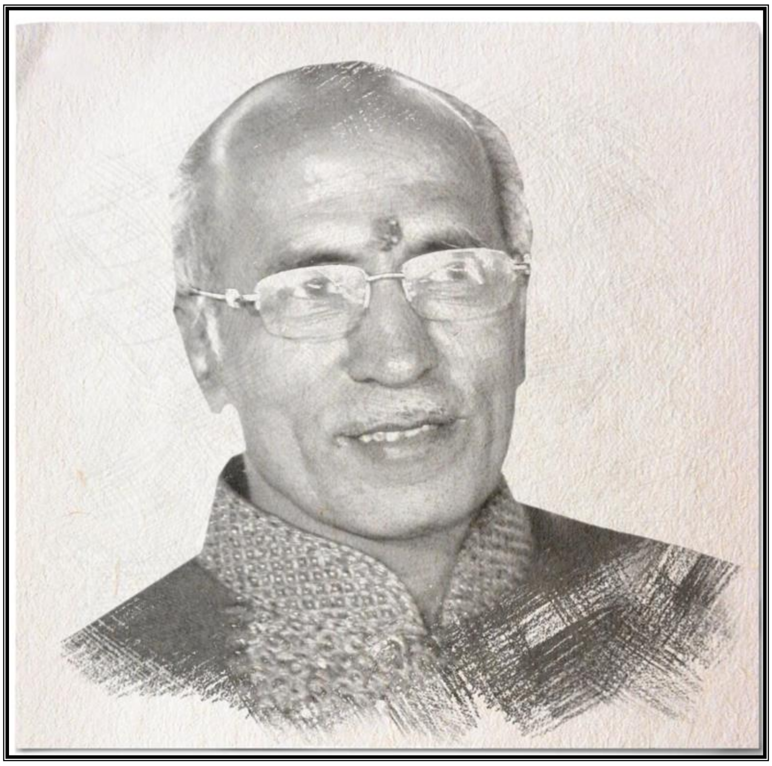

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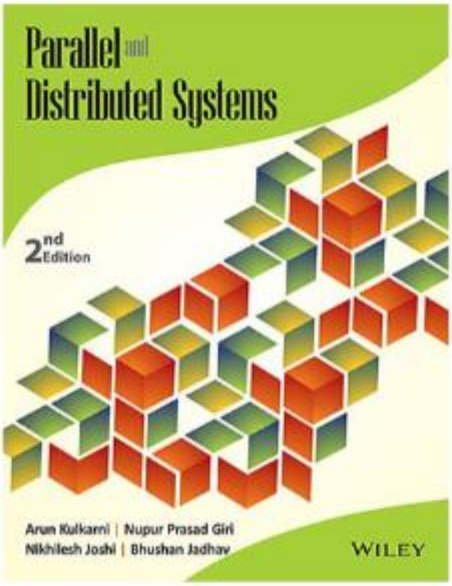
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1.8 Performance Metrics

1.9 Parallel Programming Models

1.10 Serial and Parallel Algorithms

1.11 Parallelism

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2.4 Pipeline Stage Design

2.5 Pipeline Hazards

2.6 Instruction Scheduling

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3.5 Case Studies of SIMD Parallel Processors

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6.4 Taxonomy of the Distributed Scheduling

6.5 Task Assignment Approach

6.6 Load Balancing Approach

6.7 Issues in Designing Load Balancing Algorithm

6.8 Load Sharing Approach

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7.3 Logical Clock

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7.5 Mutual Exclusion

7.6 Centralized Algorithm

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8.3 Replication Management

8.4 Distributed File Systems

8.5 Case Studies

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Short Answer Questions

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Answers

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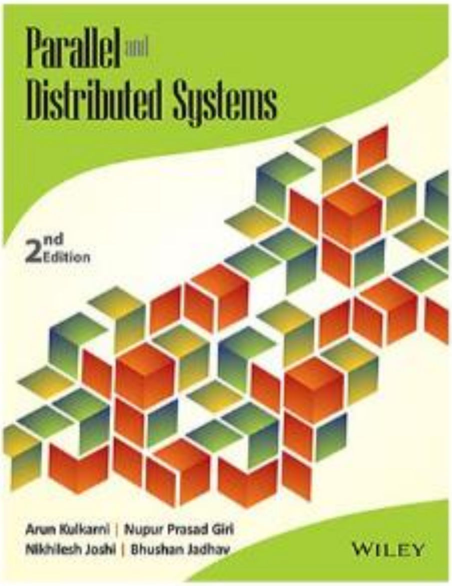
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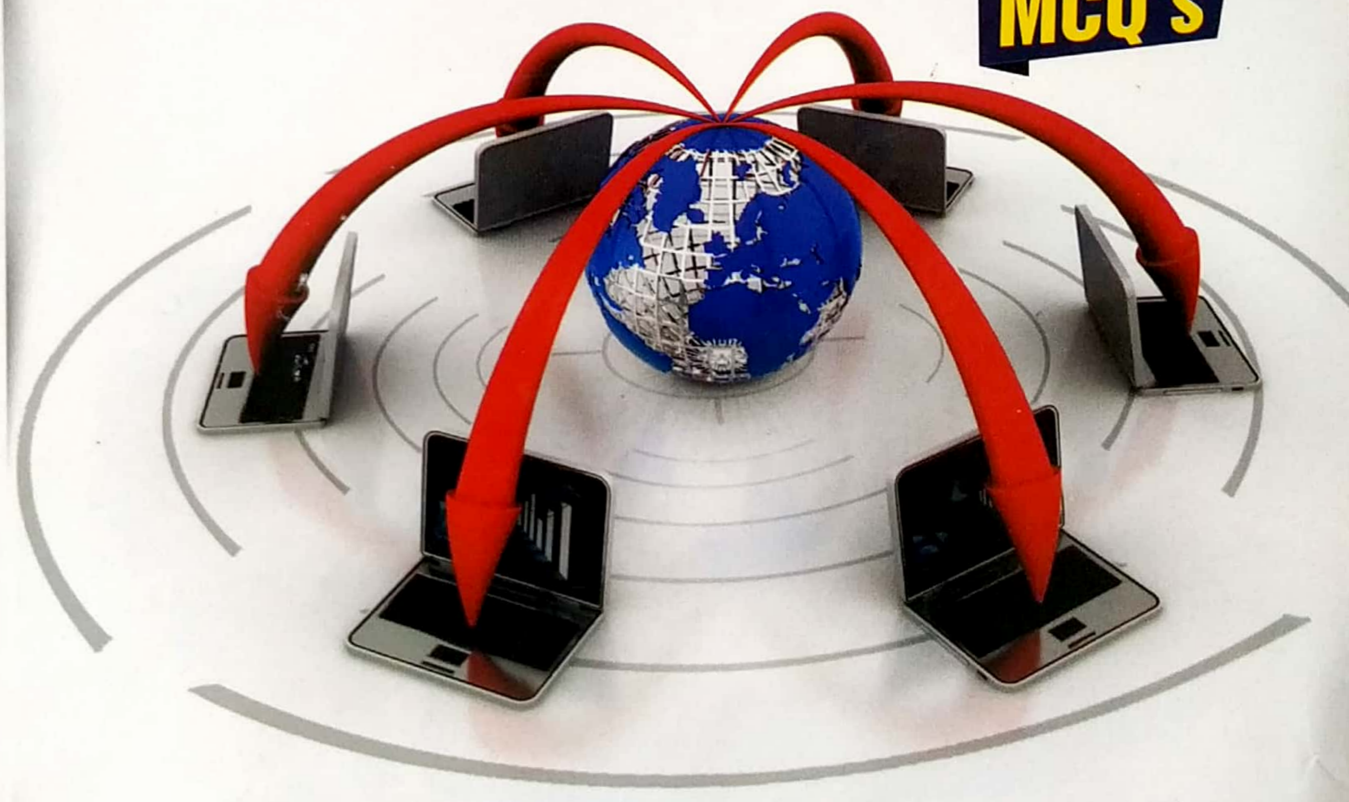

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