
	Tulsiramji Gaikwad-Patil College of Engineering and Technology Wardha Road, Nagpur-441108 NAAC Accredited (A+ Grade) An Autonomous Institute affiliated to RTMNU Nagpur		
Minor	Course Code	Name of Course	
I	BDS32321	Introduction of Data Science	
Pre-Requisites:			
Teaching Scheme		Examination Scheme	
Lectures	3	CT-1	15 Marks
Tutorial	0	CT-2	15 Marks
Total Credit	3	CA	10 Marks
		ESE	60 Marks
		Total	100 Marks
		Duration of ESE: 03Hrs 00Min.	
Course Objective:			
1	Building the fundamentals of data science.		
2	Gaining practical experience in programming tools for data sciences		
3	Empowering students with tools and techniques used in data science		
Course Contents			
Unit I	Introduction to Data Science Evolution of Data Science, Data Science Roles, Stages in a Data Science Project, Applications of Data Science in various fields, Data Security Issues. Architecture of data, data acquisition.		
Unit II	Data Collection and Data Pre-Processing Data Collection Strategies, Data Pre-Processing Overview, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization.		
Unit III	Exploratory Data Analytics Descriptive Statistics, Mean, Standard Deviation, Skewness and Kurtosis, Box Plots, PivotTable, Heat Map, Correlation Statistics, ANOVA		
Unit IV	Regression Linear Regression, Simple Linear Regression, Multiple & Polynomial Regression. Unsupervised Learning, Clustering, Similarity and Distances, Quality Measures of Clustering.		
Unit V	Model Evaluation Generalization Error, Out-of-Sample Evaluation Metrics, Cross Validation, Overfitting, Under Fitting and Model Selection, Prediction by using Ridge Regression, Testing Multiple Parameters by using Grid Search		
Text Books			
1	Data Science from Scratch-Joel Grus		
2	Introduction to Data Structures With Applications, 2 nd Edition by Jean-Paul Tremblay Paul Sorenson, McGraw Hill Education India Pvt Ltd.		
3	Data Science for Business- Tom Fawcett		

Reference Books	
1	Designing data-Intensive Applications-Martin Kleppmann
2	Data Science and Big Data Analytics- EMC Education Services
3	The Data Science Handbook- Field Cady
Useful Links	
1	https://archive.nptel.ac.in/courses/110/106/110106072/
2	https://www.youtube.com/playlist?list=PLw5h0DiJ-9PCn4shW4X43FSjEqdBwc1Cn
3	https://www.youtube.com/watch?v=W01tIRP_Rqs

Course Outcomes		CL	Class Session
After the completion of this course, students will be able to-			
1	Understand basic concepts of data science and key issues.	3	9
2	Understand data collection and data pre-processing.	2	9
3	Apply statistical analytics on datasets.	3	9
4	Implement regression models on datasets.	2	9
5	Apply appropriate evaluation metrics based on the problem domain and goals.	4	9