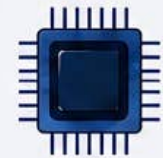
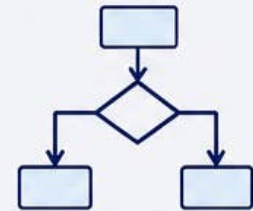




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Syllabus



Major Course (Elective-1): Data Science

Level	Semester	Course Code	Course Name	Credits	Teaching Hours	Exam Duration	Max Marks
5.5	V	112218	Data Science	2	30	2 Hrs	30

Course Objectives:	1. To introduce the fundamentals of Data Science and its applications. 2. To understand data collection, preprocessing, and visualization techniques. 3. To learn basic statistical and machine learning concepts used in Data Science. 4. To develop analytical thinking for solving real-world problems using data.						
Course Outcomes:	Students will be able to - 1. Explain the basic concepts and importance of Data Science. 2. Apply data preprocessing and visualization techniques on datasets. 3. Analyze statistical methods and machine learning models used in Data Science. 4. Evaluate real-world problems and suggest suitable Data Science solutions.						
Unit System	Contents				Workload Allotted	Weightage of Marks Allotted	Incorporation of Pedagogies
Unit I	Introduction to Data Science: Definition and importance of Data Science, Data Science lifecycle, Applications of Data Science, Types of data, Data Science tools and platforms, Introduction to Big Data and AI				8 Hrs	8 Marks	Use any pedagogical technique suitable for the topic
Unit II	Data Collection and Preprocessing: Data collection methods, Structured and unstructured data, Data cleaning and handling missing values, Data transformation and normalization, Data integration and reduction, Introduction to Python for Data Science				7 Hrs	7 Marks	
Unit III	Data Visualization: Importance of data visualization Charts and graphs: Bar chart, Pie chart, Histogram, Scatter plot Statistics: Descriptive statistics, Mean, Median, Mode, Correlation and Regression basics, Probability concepts in Data Science				8 Hrs	8 Marks	
Unit IV	Introduction to Machine Learning: Machine Learning overview, Supervised and Unsupervised learning, Classification and Regression, Clustering basics, Applications of Machine Learning in real life, Ethical issues in				7 Hrs	7 Marks	

	Data Science			
References:	Course Material/Learning Resources Text books: 1.Data Science for Beginners, Andrew Park, Tech World Publications -2nd Edition 2.Introduction to Data Science, Laura Igual& Santi Seguí, Springer -1st Edition 3. Data Science from Scratch, Joel Grus, O'Reilly Media -2nd Edition 4. Practical Statistics for Data Scientists, Peter Bruce & Andrew Bruce, O'Reilly Media -2nd Edition Reference Books: 1. Python for Data Analysis, Wes McKinney, O'Reilly Media - 3rd Edition 2. Hands-On Machine Learning with Scikit-Learn, Keras& TensorFlow, Aurélien Géron, O'Reilly Media - 3rd Edition 3. Introduction to Machine Learning with Python, Andreas Müller & Sarah Guido, O'Reilly Media - 1st Edition 4. The Elements of Data Science, Allen B. Downey, Lulu Publication - 1st Edition Weblink to Equivalent MOOC on SWAYAM if relevant: 1. https://onlinecourses.nptel.ac.in/e-learning/preview/noc23_cs99 2. https://onlinecourses.nptel.ac.in/e-learning/preview/noc23_cs21 3. https://online-degree.swayam2.ac.in/mri24_07_d03_s1_el09/preview Any pertinent media (recorded lectures, YouTube, etc.) if relevant: 1. https://www.youtube.com/watch?v=ua-CiDNNj30 2. https://www.youtube.com/watch?v=-ETQ97mXXF0			

Assessment Rubric: Internal for Theory Course (Major Elective-1)

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI THEORY EXAMINATION B.Sc. III, SEMESTER – V (NEP)			
Theory	Course Code: 112218	Course Title: Data Science	Max Marks: 20
Sr. No.	Assessment Criteria		Marks
1	Any Two of the Activity (weekly or monthly assignment/ Unit Test/Class Test) (CAT-1)		10
2	Any One of the Activity includes Open Book Test, MCQ Tests, / Theory related Class activity/Task etc.) etc. (CAT-2)		5
3	Participation in any one Activity includes Quiz, Seminar, Group Discussion, Industry visit, Case Study, Mini project, innovative work, etc. based on Theory Course. Involvement in subject related activities such as Conference, Workshop, Coding Competitions etc. (CAT-3)		5