

DATA SCIENCE (U.G.)

PROGRAM OUTCOMES:

- To proficiently manipulate and clean data using R (with packages like dplyr) and Python (using pandas).
- To conduct exploratory data analysis (EDA) and perform statistical tests using R and Python.
- To create insightful visualizations using R (ggplot2) and Python (Matplotlib, Seaborn) to communicate findings effectively.
- To build, evaluate, and deploy machine learning models using R (caret, random Forest) and Python (scikit-learn, Tensor Flow).
- To develop complete data science projects from data collection to model deployment, using both R and Python.
- To write efficient, reusable code in R and Python to solve complex data problems.
- To access and manipulate data from databases using SQL in conjunction with R and Python.
- To understand and work with big data tools and frameworks (e.g., Spark with R and Python).
- To understand and apply fundamental statistical concepts, including probability, distributions, hypothesis testing, and inferential statistics.
- To build and interpret various statistical models (e.g., regression, ANOVA, time series) to analyze data patterns and relationships.
- To formulate and test hypotheses using appropriate statistical tests, interpreting results in context.

SNO	SEMESTER-II	COURSE OUTCOMES
1	COURSE 3: INTRODUCTION TO DATA SCIENCE AND R PROGRAMMING	CO1: Recognize the various discipline that contribute to a successful data science effort. CO2: Understand the processes of data science identifying the problem to be solved, datacollection, preparation, modeling, evaluation and visualization. CO3: Be aware of the challenges that arise in Data Sciences. CO4: Be able to identify the application of the type of algorithm based on the type of the problem.

		<p>CO5: Be comfortable using commercial and open source tools such as the R/Python language and its associated libraries for data analytics and Visualization.</p>
2	<p>COURSE 4: DESCRIPTIVE STATISTICS</p>	<p>COURSE OUTCOMES</p> <p>CO1: Knowledge of Statistics and its implementation through practical understanding for various domains related to data science.</p> <p>CO2: Knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.</p> <p>CO3: Knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes, insights into preliminary exploration of different types of data.</p> <p>CO4: Knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations.</p>
3	<p>SEMESTER-III</p> <p>COURSE 5: PYTHON PROGRAMMING FOR DATA ANALYSIS</p>	<p>COURSE OUTCOMES</p> <p>CO1: To be able to Program in Python.</p> <p>CO2: To know and understand the data Analysis phases and to know the usage of all libraries.</p> <p>CO3: Understands and learn all basic concepts of Python Program Data Analysis methods in Python.</p> <p>CO4: Get used with Python Programming environments.</p>

4	<p>COURSE 6:</p> <p>INFERENTIAL AND APPLIED STATISTICS</p>	<p>COURSE OUTCOMES</p> <p>CO1: Concept of law large numbers and their uses knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts</p> <p>CO2: Knowledge about inferences from Binomial, Poisson and Normal distributions as illustrations, concept about non-parametric method and some important non-parametric tests.</p> <p>CO3: Time series data, its applications to various fields and components of time series.</p> <p>CO4: Various data collection methods enabling to have a better insight in policy making, planning and systematic implementation, Construction and implementation of life tables, Population growth curves, population estimates and projections.</p> <p>CO5: Real data implementation of various demographic concepts as outlined above through practical assignments.</p>
5	<p>COURSE 7:</p> <p>DATA MINING TECHNIQUES USING R</p>	<p>COURSE OUTCOMES</p> <p>CO1: To understand Data mining techniques and algorithms.</p> <p>CO2: To comprehend the data mining environments and application.</p> <p>CO3: To Compare various conceptions of data mining as evidenced in both research and application.</p> <p>CO4: Evaluate mathematical methods underlying the effective application of data mining.</p> <p>CO5: Should be able to apply the type of techniques based on the problems considered and can find out the market patterns and association amongst different products.</p>
6	<p>COURSE 8:</p> <p>Web Technologies</p>	<p>COURSE OUTCOMES</p> <p>CO1. Design and develop web applications.</p> <p>CO2. Explain client and server-side scripting and their applicability.</p> <p>CO3. Create scripts using JavaScript in a web page.</p> <p>CO4. Integrate JavaScript in a web page.</p> <p>CO5. Design forms and check for data accuracy.</p>

7	SEMESTER-IV COURSE 9: Data visualization using Tableau	COURSE OUTCOMES CO1: To know the importance of data Visualization in the world of Data Analytics and Prediction. CO2: To know the important libraries in Tableau and to get equipped with Tableau Tool. CO3: Students should be able to visualize data through seven stages of data analysis process. CO4: Should be able to do explanatory and hybrid types of data visualization. CO5: Should be able to understand various stages of visualizing data.
8	COURSE 10: DATA VISUALIZATION USING PYTHON	COURSE OUTCOMES CO1: To use data analysis tools in the pandas library. CO2: To load, clean, transform, merge and reshape data. CO3: To create informative visualization and summarize data sets. CO4: To analyze and manipulate time series data. CO5: To solve real world data analysis problems.
9	COURSE 11: INTRODUCTION TO SQL & ADVANCED TABLEAU	COURSE OUTCOMES CO1: To design a database by its own and perform simple and adhoc queries. CO2: To employ best practice in data visualization to develop charts, maps, tables, and other visual representations of data. CO3: To employ best practices in data visualization to develop charts, maps, tables, and other visual representations of data. CO4: To create compelling, interactive dashboards to combine several visualizations into a cohesive and functional whole. CO5: To utilize advanced Tableau features including parameters, data blending, custom SQL, very large data.