Program Name: **M. Sc. Big Data Analytics**

Program specific Outcomes

This program will:

PSO1: Prepare students to understand and apply different tools and techniques of big data analytics through mathematical, statistical and machine learning approaches.

PSO2: Semester 4 of the program is internship based project in which each student will apply their knowledge gained in the program in the real-life data which also help them to understand the current trends in industry

Course outcomes for all courses offered by the department:

Semester	Course code	Course name	Course Outcomes Student completing this course is able to
1	PBD-1801	Statistical Methods	1: Understand data pre-processing and data cleaning 2: Identify the suitable descriptive measures to explore the data. 3: Learn the analysis of attributes and Chi-square tests for categorical data 4: Apply basic statistical methods in real data using R
1	PBD-1802	Probability & Stochastic Process	1: Apply basic ideas of probability and probability distributions in real life situation 2: Apply the concept of stochastic process in different sectors like brand switching in Marketing Analytics . 3: Estimate probability distributions and do basic time series data analysis through R
1	PBD-1803	Linear Algebra & Linear Programming	1: Student will be able to perform matrix operations and employ fundamental concepts of matrix theory. 2: Students will be able to employ linear algebra to solve some scientific problems. 3: Student will be able to use fundamental concepts like system of simultaneous linear equations, eigenvalues and eigenvectors in some applicable concepts. 4: Student will be able to formulate and model linear programming problems. 5: Student will be able to solve real life problems using linear programming problems and interpret solution of linear programming problems.
1	PBD-1804	Computing for Data Sciences	1: Understand data structures 2: Learn the concepts of data science using Java

			3: Learn how to do installation of R and application of R in big data. 4: Learn as programming language for application to compute very large data. 5: Do algorithm from numerical analysis like Newton-Raphson, Steepest ascent method etc. 6: Learn Monte-Carlo method, which is great methodology for computing methodologies. 7: Understand how to handle strategies for big data.
1	PBD-1805	Database management and data mining	1: Learn basic data models and Hadoop Ecosystem 2: Understand few relational and non-relational databases 3: Explore hands on experience on Oracle/MySql 4: Implementation of ORACLE SQL/MS SQL/MySQL.
1	PBD-1806	Python Programming	1: Write python functions 2: Understand packages and importing packages 3: Learn file handling 4: Develop OO Programming Concepts and get exposure on Exception Handling along with OO programming
2	PBD-2801	Foundations of Data Science	1: Learn basic concept of graph theory and understand algorithm on connectedness, shortest path algorithm and spanning tree of graph. 2: Learn High dimensional space and understand geometry of large data set. 3: Random graph is use in industries, so they learn when Giant component emerge in random graph. When the random graph is connected, cycle? Students will establish these. 4: Learn above Singular value decomposition, which has application in image processing, principal component analysis etc. 5: Random walk is use to make prediction, students will learn regarding the same. 6: Learn few algorithm for massive data problems.
2	PBD-2802	Advanced Statistical Methods	1: Identify best estimators by applying knowledge on properties of estimators 2: Analyze and apply statistical inference by showing how hypothesis testing can be developed for situations involving single population and two populations 3: Apply concepts of the linear models in real life situation 4: Analyze data through regression methods as a statistical technique 5: Estimate best line fit and classify binary outcomes.

2	PBD-2803	Introduction to Machine Learning I	1: Study the basic concepts and techniques of Machine Learning 2: Learn supervised algorithms 3: Evaluate the model performance 4: Learn the concepts of neural networks
2	PBD-2804	Enabling Technologies for Data Science I	1: Learn the concept of various big data platforms like Hadoop ecosystem and its major components. 2: Learn NoSQL database 3: Learn workflow scheduler tool Oozie in Hadoop environment.
2	PBD-2805	Value Thinking	1: Enhance logical thinking, argumentative logic, evidence gathering, and drawing inference from evidences. 2 : Get more awareness of the factors like deep rooted prejudices, pre-conceived ideas, psychological and sociological influences that sub-consciously come into play in decision making and forming impressions.
2	PBD-2901(2950)	Operations Research	1: Student will be able to formulate and model non-linear programming problems. 2: Student will be able to solve real life problems using non-linear programming problems and interpret solution of non-linear programming problems. 3: Student will be able to formulate and model assignment and transportation problems. 4: Student will be able to solve real life problems using assignment and transportation problems and interpret solution of assignment and transportation problems 5: Student will be able to set up queuing models. 6: Student will be able to solve real life problems using queuing models
3	PBD-3801	Modeling in Operations Management	1: Analyse and build statistical models on banking and other financial institution data through R 2: Apply different data mining techniques to analyze and forecast customer trends/behaviour 3: Analyse health care related data and build statistical models to predict and classify presence and absence of a particular disease. 4: Predict customer churn in Churn Analytics using different data mining techniques 5: Forecast the revenue generated at the end of a particular period of time to understand the financial status and inventory management in Supply chain.
3	PBD-3802	Enabling Technologies for Data Science	1: Learn the concept of various big data platforms like Hadoop ecosystem and its major components.

3	PBD-3803	Value Thinking	1: Enhance logical thinking, argumentative logic, evidence gathering, and drawing inference from evidences. 2: Get more awareness of the factors like deep rooted prejudices, pre-conceived ideas, psychological and sociological influences that sub-consciously come into play in decision making and forming impressions.
3	PBD-3950	Time series & forecasting	1: Apply classification and regression algorithms in real life data 2: Apply clustering algorithms 3: Apply probabilistic graphical models.
3	PBD-3951	Introduction to econometrics & finance	1: The students will be able to understand how to undertake empirical research and analysis 2: The students will be able to appreciate the strengths and weaknesses of various econometric techniques 3: The student will be able to evaluate competing economic theories and alternative policies 4 : The student will be able to understand the intricacies of various economic variables involved in a big data and learn to model them
4	PBD-4801	Internship based project	1: The students will be able to handling data extensively 2: The students will be able to use of methodologies learnt during the course work to derive meaningful inferences 3: The students will be able to present and defend his/her inferences