COURSE CURRICULUM FRAMEWORK UNDER AUTONOMY

Program: MSc
Department: Big Data Analytics

Semester 1		
Course code	**Course Title**	**Credits**
SBDA101	**Statistical Methods** Data Collection & Visualization Basic Statistics Contingency Tables	**3**
SBDA102	**Probability & Stochastic Process** Basic Probability Probability Distribution Stochastic Process Introduction to Time Series	**3**
SBDA103	**Linear Algebra & Linear Programming** Linear Algebra Linear Programming	**3**
SBDA104	**Database Management** Basic Concepts Relational and Non-Relational Databases Implementation	**3**
SBDA105	**Computing for Data Sciences** Computer Packages Data Structure & Concepts of Computation Computing Methodologies	**3**
SBDA101PR	**Statistical Methods Practical**	**2**
SBDA102PR	**Probability & Stochastic Process Practical**	**2**
SBDA103PR	**Linear Algebra & Linear Programming Practical**	**2**
SBDA104PR	**Database Management Practical**	**2**
SBDA105PR	**Computing for Data Sciences Practical**	**2**

Semester 2		
Course code	**Course Title**	**Credits**
SBDA201	**Enabling Technologies for Data Science-I** Introduction Data Warehousing Data Preparation Classification and Prediction Cluster Analysis and Deviation Detection Temporal and spatial data mining	**3**
SBDA202	**Machine Learning – I** Linear Regression	**3**

	Logistic Regression Neural Networks Machine Learning System Design Support Vector Machines Unsupervised Learning Dimensionality Reduction Anomaly Detection	
SBDA203	**Advanced Statistical Methods** Estimation Test of Hypotheses Linear Model Regression	**3**
SBDA204	**Foundations of Data Science** Graph Theory High Dimensional Space Random Graphs Singular Value Decomposition (SVD) Random Walks Algorithm for Massive Data Problems	**3**
SBDA205C	**Cloud Computing** Introduction to Cloud computing Cloud service methods Introduce DevOps	**3**
SBDA206	**Value Thinking**	**1**
SBDA201PR	**Enabling Technologies for Data Science-I Practical**	**2**
SBDA202PR	**Machine Learning – I Practical**	**2**
SBDA203PR	**Advanced Statistical Methods Practical**	**2**
SBDA204PR	**Foundations of Data Science Practical**	**2**
SBDA205CPR	**Cloud Computing Practical**	**2**

Semester 3		
Course code	**Course Title**	**Credits**
SBDA301	**Enabling Technologies for Data Science-II** Spark, Scala, Mahout.	**3**
SBDA302	**Machine Learning-II** Decision Tree Classification Probabilistic Classifiers Hyper plane classifiers Application of to Pattern Recognition Problems Clustering	**3**
SBDA303	**Exploratory Data Analysis** Data Visualization with Tableau Modelling in Operations Management	**3**
SBDA304A	**Introduction to Econometrics and Finance** Analysis of Panel Data. Generalized Method of Moments (GMM).	**3**

	Simultaneous Equations System: Cointegration Concept, two variable model, Engle-Granger Method, Vector auto regressions (VAR), Vector error correlation model (VECM). ARCH/GARCH/SV models, some important generalizations like EGARCH & GJR models, ARCH –M models.	
SBDA305B	**Introduction to Bioinformatics** Sequence Alignments. Advance Alignment Methods. Gibbs Sampling. Population Genomics. Genetic Mapping. Disease Mapping. Gene Recognition. Transcriptome & Evolution. Protein Structure. Protein Motifs. Hidden Markov Model. Lattice Model Algorithms.	**3**
SBDA301PR	**Enabling Technologies for Data Science-II Practical**	**2**
SBDA302PR	**Machine Learning-II Practical**	**2**
SBDA303PR	**Exploratory Data Analysis Practical**	**2**
SBDA304APR	**Introduction to Econometrics and Finance Practical**	**2**
SBDA305BPR	**Introduction to Bioinformatics Practical**	**2**

Semester 4		
Course code	**Course Title**	**Credits**
SBDA401PJ	**Internship based project.**	**20**