

## COURSE CURRICULUM FRAMEWORK UNDER AUTONOMY

**Program: MSc**

**Department: Big Data Analytics**

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

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

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

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

	<p>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 &amp; GJR models, ARCH –M models.</p>	
<b>SBDA305B</b>	<p><b>Introduction to Bioinformatics</b> Sequence Alignments. Advance Alignment Methods. Gibbs Sampling. Population Genomics. Genetic Mapping. Disease Mapping. Gene Recognition. Transcriptome &amp; Evolution. Protein Structure. Protein Motifs. Hidden Markov Model. Lattice Model Algorithms.</p>	<b>3</b>
<b>SBDA301PR</b>	<b>Enabling Technologies for Data Science-II Practical</b>	<b>2</b>
<b>SBDA302PR</b>	<b>Machine Learning-II Practical</b>	<b>2</b>
<b>SBDA303PR</b>	<b>Exploratory Data Analysis Practical</b>	<b>2</b>
<b>SBDA304APR</b>	<b>Introduction to Econometrics and Finance Practical</b>	<b>2</b>
<b>SBDA305BPR</b>	<b>Introduction to Bioinformatics Practical</b>	<b>2</b>

<b>Semester 4</b>		
<b>Course code</b>	<b>Course Title</b>	<b>Credits</b>
<b>SBDA401PJ</b>	<b>Internship based project.</b>	<b>20</b>