

## **ADVANCED DATA VISUALIZATION (3-0-0)**

### **Objective:**

- To extend student's knowledge in the area of Data Science with emphasis on Predictions utilizing associated statistical methods and software tools.

### **MODULE – I**

Introduction to Data Acquisition – Applications –Process- Data Extraction- Data Cleaning and Annotation- Data Integration -Data Reduction- Data Transformation –Visualization-Introduction -Terminology- Basic Charts and Plots- Multivariate Data Visualization- Data Visualization Techniques– Pixel-Oriented Visualization Techniques- Geometric Projection Visualization Techniques- Icon-Based Visualization Techniques- Hierarchical Visualization.

### **MODULE – II**

Techniques Visualizing Complex Data and Relations Data Visualization Tools– Rank Analysis Tools- Trend Analysis Tools- Multivariate Analysis Tools- Distribution Analysis Tools- Correlation Analysis Tools- Geographical Analysis Tools.

### **MODULE – III**

Regression model building framework: Problem definition, Data pre-processing; Model building; Diagnostics and validation Simple Linear Regression: Coefficient of determination, Significance tests, Residual analysis, Confidence and Prediction intervals.

### **MODULE – IV**

Multiple Linear Regression: Coefficient of multiple coefficient of determination, Interpretation of regression coefficients, Categorical variables, Heteroscedasticity, Multi-co linearity, outliers, Auto regression and transformation of variables, Regression model building.

### **Outcome:**

- Ability to apply specific statistical and regression analysis methods applicable to predictive analytics to identify new trends and patterns, uncover relationships, create forecasts, predict likelihoods, and test predictive hypotheses.
- Ability to develop and use various quantitative and classification predictive models based on various regression and decision tree methods.

### **Books Recommended:**

1. Andy Kirk, Data Visualization A Handbook for Data Driven Design, Sage Publications, 2016
2. Philipp K. Janert, Gnuplot in Action, Understanding Data with Graphs, Manning Publications, 2010.
3. Alberto Cordoba, "Understanding the Predictive Analytics Lifecycle", Wiley, 2014.
4. Eric Siegel, Thomas H. Davenport, "Predictive Analytics: The Power to Predict Who Will Click,Buy, Lie, or Die", Wiley, 2013.
5. James R Evans, "Business Analytics – Methods, Models and Decisions", Pearson 2013.
6. R. N. Prasad, SeemaAcharya, "Fundamentals of Business Analytics", Wiley, 2015.