

## **Details of Certificate Course on SPSS and MS- Excel**

**Title of the course: Statistics using SPSS and MS- Excel**

**Name of coordinator:** Mr. Ananda. K.S., Dept of Statistics, St. Joseph's College

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**Duration:** 60 Hrs

**Course fee:** Rs. 3000/- (Rs. 6,000 for outsiders)

**Number of Credits:** 2 Credits

**Timings:** Slot– 1: Every 2<sup>nd</sup> and 4<sup>th</sup> Tuesday between 3 pm – 5 pm (tentative)

Slot– 2: Every 3<sup>rd</sup> Saturday between 10 am – 1 pm

**Venue:** Statistics Lab (Computer Lab No – 5, Magis Block)

**Note:** Students are expected to select appropriate slot during registration only (after referring to their time table) and any requests about change in time slots will not be entertained.

### **Course Objectives**

- Facilitates students who are involved in research projects, dissertations/term-paper to build statistical models and apply statistical tests using SPSS and MS-Excel
- The course is designed with an objective of instilling analytical skills among students to meet current Industry requirements
- Also the concepts of the course bound to help final year students (UG or PG) who are preparing for competitive exams, Bank exams, Entrance exams etc. which demands strong computational and Analytical abilities
- Completing this course will be an added advantage for all final students who are seeking a job after they finish their graduation



# SYLLABUS

## Module – 1: Introduction to SPSS

6 hrs

Creating/retrieving SPSS data files and output files, different data types, scale of measurements, classification techniques Basics of SPSS, Data entry in SPSS, missing values, multi response Data transformation through SPSS: selection of cases, recoding of variables, identification of duplicate cases, compute variable, merge files

## Module – 2: Basic Statistics

9 hrs

- Statistics: Meaning, Application and limitation
- Basic terminologies
  - Population, Sample
  - Variables and Attributes
  - Types of data
    - Primary data and Secondary data
    - Qualitative data and Quantitative data
    - Univariate data and Multivariate data
    - Discrete data and Continuous data
  - Concepts of measurement
    - Types of Scale: Nominal, Ordinal, Interval, and Ratio
- Different methods of presenting data
  - Tabular representation
  - Diagrammatic representation
  - Graphical representation

## Module – 4: Exploratory Data Analysis

15 hrs

- Measures of Central tendency
- Measures of dispersion, absolute and relative measures
- Measures of skewness and kurtosis
- Analysis of Bivariate data
- Scatter diagram of bivariate data
- Pearson correlation of co-efficient
- Spearman's rank correlation (non-parametric measure of correlation)
  - Case of ties
- t-test for significance of correlation
- simple linear regression and fitting of straight line

## Module – 5: Testing of Hypotheses

15 hrs

- Basics of Testing
  - Null and Alternative hypothesis

- Simple and Composite hypothesis
- Small sample and Large sample test
- Tests concerning means
  - One Population
    - Univariate: t-test, z-test
    - Bivariate : Paired t-test
  - Two Populations: t-tests, z-tests
- Chi-Square test
  - Single variance
  - Goodness of fit
  - Testing for independence of attributes
- Graphical test for normality
  - QQ plot
  - Box plot
  - Histogram

### **Module – 6: Regression Analysis**

**12 hrs**

- Introduction
- Multiple linear regression
- Validation of model
  - Residual analysis
  - Checking normality
- Confidence interval for regression co-efficients
- T-tests for related to regression co-efficients
- Transformation to achieve linearity
  - Log transformation
- Transformation to stabiles variance
  - Power transformation
- Polynomial regression models
- Multiple regression models

### **Module – 7: Data Collection Methods**

**3 hrs**

- Sample surveys
  - Sources of data collection
  - Principal steps in a sample survey
  - Sampling and Non-sampling error
  - Questionnaire
    - Requisites of a good questionnaire
    - Drafting of questionnaires
    - Pilot surveys
- Census and Sampling

- Types of Sampling
- Sampling Errors and Non-sampling Errors