

# St. Xavier's College (Autonomous), Ahmedabad

Syllabus of Semester – II of the following departments under Faculty of Computer Science based on Undergraduate Curriculum Framework to be implemented from the Academic Year 2024-25.

## DEPARTMENT OF COMPUTER SCIENCE

BCA (Hons.)

Category-IV

### Multidisciplinary Course: Statistical Computing

#### **CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Lecture	Tutorial	Practical / Practice		
Statistical Computing	2		2	10 + 2 from a recognized board in any stream	Nil

#### **Course Introduction:**

This course introduces the subject of statistics and statistical problem solving. It also develops the ability to find approximate solutions and/or answer by choosing correct statistical technique for a given problem.

#### **Objectives:**

Students will be able to:

- 1.) Get a working knowledge of statistical methods.
- 2.) Understand the use of statistical methods with computer related computational approach.
- 3.) With statistical techniques so that they are prepared to apply the knowledge in the field of computer science.

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
1	<b>Introduction and Measures of Central Tendency</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Definitions, Functions, Scope and Limitations of Statistics</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Meaning of Statistics</li> <li>○ Functions of Statistics</li> <li>○ Scope or Importance of Statistics</li> <li>○ Limitations of Statistics</li> </ul> </li> </ul>	2 hrs
1	<ul style="list-style-type: none"> <li>• <b>Measures of Central Tendency</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Characteristics of a Good Average.</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Different Types of Measures of Central Tendency</b> <ul style="list-style-type: none"> <li>○ Mean           <ul style="list-style-type: none"> <li>▪ Arithmetic Mean</li> <li>▪ Arithmetic Mean of Grouped Frequency Distribution</li> <li>▪ Short-cut Method and Step-Deviation Method of Obtaining Arithmetic Mean (Excluding Mathematical Properties of A.M)</li> <li>▪ Combined Arithmetic Mean</li> <li>▪ Cumulative Arithmetic Mean</li> <li>▪ Advantages, disadvantages of Arithmetic Mean</li> <li>▪ Geometric Mean</li> </ul> </li> </ul> </li> </ul>	8 hrs

- Advantages, disadvantages and uses of G. M
- Harmonic Mean
- Advantages, disadvantages and Uses of H.M
- Relation Among A.M.,G.M.,H.M.
- Weighted Arithmetic Mean
- Median
  - Individual Frequency Distribution
  - Ungrouped Frequency Distribution
  - Grouped Frequency Distribution
  - Advantages, disadvantages and uses of Median
- Mode
  - Individual Frequency Distribution
  - Ungrouped Frequency Distribution
  - Grouped Frequency Distribution
  - Advantages, disadvantages and uses of Mode

**Practical Demo should be given for Mean, Median and Mode in Excel**

**Measures of Dispersion Or Variation 10 hours**

- **Quartiles, Deciles and Percentiles**
- **Introduction, Objectives and essentials of a good measure**
- **Absolute and Relative Measures of Dispersion**
  - Range 4 hrs
  - Quartile Deviation
    - Advantages and disadvantages of Q.D.
    - Coefficient of Quartile Deviation
  - Mean Deviation
    - Coefficient of Mean Deviation
    - Advantages and disadvantages of M.D.
  - Standard Deviation 4 hrs
    - Alternative Method of Standard Deviation
    - Relationship among Q.D., M.D., S.D.
    - Advantages and disadvantages of S.D.
  - Variance (Excluding Properties of S.D)
    - Coefficient of Variation
    - Direct Method 2 hrs
    - Step-Derivation Method

**Practical Demo should be given for Range, Q.D, M.D, S.D in Excel  
Probability and Mathematical Expectation 10 hours**

- **Probability**
  - Introduction
  - Definitions of Some Important Terms 3 hrs
    - Random Experiment
    - Trial Event
    - Favorable Cases

- Equally Likely Events
- Mutually Exclusive Events
- Exhaustive Events
- Dependent Events
- Independent Events
- Classical approach to probability
- Statistical approach to probability
- Modern approach to probability
- Symbols associated with probability
- Algebra of sets
- Conditional Probability 7 hrs
- Theorems (Laws) of Probability(Without Proof only Examples)
  - Addition (Only for two events)
  - Multiplication (Only for two events)
- Baye's Rule(only for two events)

**Correlation Analysis And Regression Analysis 10 hours**

- **Correlation Analysis**
  - Introduction
  - Types of Correlation
    - Positive, Negative and Zero Correlation
    - Linear and non-linear Correlation
    - Simple, Multiple and Partial Correlation 6 hrs
    - Positive, Negative and Zero Correlation
    - Methods of Measuring Correlation
    - Karl Pearson's Product Moment Method
    - Spearman's Rank Method
    - Concurrent Deviation Method
- **Regression Analysis**
  - Definition
    - Regression Equation.
    - Method of Least Squares.
    - The regression equation of Y on X
    - The regression equation of X on Y
    - Regression Coefficient & Its Properties (without proof) 4 hrs
  - Correlation Versus Regression
  - Coefficient of Determination

**Practical Demo should be given for Correlation and Regression in Excel**

**Note: - Excel function/s and its syntax should not be asked in theory examination.**

**Textbook:**

Business Statistics (Third Revised Edition)

Publication: S.Chand

By Padmalochan Hazarika

- **Chapter-1**(1.1,1.2,1.3,1.4,1.5)
- **Chapter-5**(5.1,5.2,5.4,5.5)
- **Chapter-6**(6.1,6.2,6.3,6.4,6.5(Excluding Lorenz Curve))
- **Chapter-8**(8.1,8.2,8.3)
- **Chapter-13**(13.1, 13.2)

**Reference Book:**

1. Business Mathematics and Statistics  
Publication: Tata McGraw Hill Education Private Limited  
By N G Das and J K Das