Shri Shivaji Education Society Amravati's

SCIENCE COLLEGE

Congress Nagar, Nagpur

Accredited with CGPAof 3.51 at 'A+' Grade by NAAC Bangalore
A college with Potential for Excellence
An Institutional Member of APQN Recognized
Centre for Higher Learning &Research
A Mentor College under "Paramarsh Scheme" of UGC, New Delhi
A Mentor College under Paris Sparsh Scheme of Maharashtra State
An ISO 21001:2018 Certified Institution
National Institute Ranking Framework (NIRF) Rank-band: 201-300

STATISTICS DEPARTMENT

PO, CO, PSO

Program Outcomes

PO1. Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2.Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. Effective Citizenship: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO7. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life- long learning in the broadest context socio-technological changes.

Program Specific Outcomes PSOs:

Upon completion of the program, students would be able to

1. **PSO:** Recall basic facts about statistics and should be able to display knowledge of conventions such as notations, terminology.

2. **PSO:** Get adequate exposure to global and local concerns that explore them many aspects of mathematical sciences.

3. **PSO:** Be equipped with statistical modeling ability, problem solving skills, creative talent and power of communication necessary for various kinds of employment.

4. **PSO:** Apply their skills and knowledge that is translate information presented verbally into statistical form, select and use appropriate statistical formulae or techniques in order to process the information and draw the relevant conclusion.

5. **PSO:** Develop a positive attitude towards statistics as an interesting and valuable subject of study.

6. **PSO:** Acquire basic knowledge of diagrammatic & graphical representation of Data with and without software.

DEPARTMENT OF STATISTICS
COURSE OUTCOMES
PROGRAMME: B.Sc.

B.Sc. 1st year SEM I

DSC-I Probability Theory (BST1T01)

OBJECTIVES

A majority of topics in Statistics depend upon a strong foundation of Probability theory It also serves as base for applied probability theory. Another basic concept is that of a random variable , its distribution and associated properties. This course includes topics like Conditional probability, Baye's theorem,p.m.f., p.d.f., moments,etc.

CO1: Probability Axioms:- Students will demonstrate an understanding of probability, including addition and multiplication rules and conditional probability.

CO2: Random Variables:- Students will be able to define and work with both Discrete and continuous random variable, understanding their properties and behavior.

CO3: Bayes' Theorem: Students will be Applying Bayes theorem to calculate conditional Probabilities.

CO4: Independence Of Events:-Students will be Understand the concept of independent events and their significance in simplifying probability computations.

CO5: Expected Value: Students will be able to compute the expected value of random variable and understand its role in predicating long-term outcomes.

CO6: Variance and Standard Deviation:- Students will be Understand the concepts of variance and standard deviation, Using them to measure the spread of distributions.

DSC- II Descriptive Statistics (BST1T02)

OBJECTIVES:

Students acquire knowledge about analysis of quantitative data, concepts of Central tendency, dispersion,etc.

CO1: Measures Central Tendency:- Student will be able to compute and interpret measure of central tendency (mean, median and mode) and understand when each is most appropriate.

CO2: Measures Dispersion:- Student will be able to calculating and interpreting range, variance, standard deviation, and interquartile range (IQR) to describe variability.

CO3: The different types of partition values and the concepts of **skewness and**

kurtosis

CO4: The concept of bivariate data and correlation coefficient as well as regression.

CO5: Students will able to describe the correlation between interrelated variables and also able to find appropriate **regression equation** among the variables.

CO6: Concept of correlation, correlation coefficients - **Karl Pearson's correlation coefficient, Spearman's rank correlation coefficient,** multiple and partial correlation coefficients, Interaclass correlation

Vocational Skill Course(VSC-BVS1P01)

SEM1: Course Outcomes: BVS1P01(R-language)

Course outcomes: This course will enable the students to

CO1. Student will learn Algebraic Calculation using R .

CO2. Student will learn Statistical Analysis

CO3. Students will learn Graphical representation.

Indian Knowledge System(IKS-B1k1T01)

SEM1: VEDIC MATHEMATICS (BIK1T0 1)

Course Outcomes: This course will enable the students to

CO1. Improve speed and accuracy in numerical calculations

CO2. Acquire IQ skills and high-end technical knowledge

CO3. Gain test taking skills & creativity of calculations

Skill Enhancement Courses (SEC BVS1P02)

SEM1: Power Point Presentation (PPT)

Course Outcomes; This course will enable the students to

CO1.Preparation of effective PPT

CO2.Public Speaking Skills

CO3.Presenting PPT Efficiently

(VEC) Environmental Science BVE1T01

SEM1: Environmental Science (BVE1T01)

COURSE OUTCOMES:

At the end of the course, students shall be able to:

- Explain the basics of Environmental Science and Atmospheric Science along-with the components of Environment

- Explicate the importance of Environmental Education.
- Elucidate the fundamentals of atmospheric science including formation, depletion and effects of ozone layer and acid rain on environment.
- Describe the various physical and chemical characteristics and properties of Water and Soil
- Understand the Ecology and its allied branches
- Comprehend about Population and Community Ecology
- Study the changes in Population by understanding the concept of Population ecology

OE/GE1(BGO1T01)

OBJECTIVES:

Students acquire knowledge about how to classify and tabulate data . They also learn various methods of graphical and diagrammatic representations of data.

COURSE OUTCOMES

Students acquire knowledge about: Construction of tables with many factors of classification. They also learn analysis of categorical data.

OE/GE2 (BGO1T02)

OBJECTIVES:

To train the students to solve the problems of statistics that appear in most of the competitive exams conducted by Banking, State and Central Governments and other agencies.

Course Outcomes (CO)

After the successful completion of the course, the students will be able to develop the data analysis skills required for Competitive Examinations.

B.Sc. 1st year SEM II

DSC-III Probability Distribution (BST2T03)

CO1: Students should be able to interpret and use **Probability Mass Function (PMF)** for discrete distribution and **Probability Distribution Function (PDF)** for continuous distribution.

CO2: Students will get familiar with basic concepts of **Standard Probability Distributions.**

CO3: Students will be able to apply the standard **discrete probability Distributions** like **Binomial**, **Poisson** and **Geometric** to different real life situations

CO4: Students will be able to apply the standard **continuous probability**

Distributions like **Normal, Exponential, Gamma, Beta** and **Uniform** to different real life situations.

CO5: Lack of Memory property of **Geometric Distribution.**

CO6: Students will get familiar with **Raw and Central Moments** and Mathematical Expectation.

DSC-IV Economic Statistics (BST2T04)

CO1: Students will understand the concept of **Economic Statistics**

CO2: To have detailed knowledge about various types of **index numbers** related to Economic Statistics.

CO3: To use **Consumer Price index** for regulation of D.A.

CO4: To apply **time series analysis** in various fields.

CO5: To apply **demand analysis**, **Pareto's** income distribution, **Lorenz** curve etc

B.Sc. 2nd year SEM III

DSC-V Statistical Methods (BST3T05)

CO1: Students will understand the concept of **bivariate data**.

CO2:To extend the concept of univariate distribution to **bivariate** distribution in case of Both **discrete and continuous** random variables.

CO3:To study the concept of **Joint distribution** and the independence of two Random Variables.

CO4:To study the concept of **Marginal** distribution of two random variables.

CO5:To implement the variation and the relation between two random variables by using The concept of **covariance and correlation** between two random variables.

CO6: The basic concepts to bivariate normal distribution and study various Properties of **bivariate normal distribution.**

DSC-VI Applied Statistics (BST3T06)

CO1: Students will describe various terms for **Vital Statistics**

CO2: Students will able to analyze the **Psychological** and education Statistics.

CO3: Student will familiar with scaling values such as **Z-score**, **T-score** etc.

CO4: Student will able to use concept of **Reliability and validity**.

CO5: Students will be able to handle the **Rulon and kudar Richardson** Formulae of test of reliability.

B.Sc. 2nd year Sem IV

DSC-VII Statistical Inference(BST4T07)

CO1: Students will describe various terms for **point estimation**, **interval** estimation to understand the problem of statistical inference.

CO2: Students will estimate the parameters with multiple criteria.

CO3: Students will able to analyze the **estimation techniques** and apply suitable estimation and detection techniques

CO4: Students will understand the **Testing of Hypothesis.**

CO5: Students will understand the difference between **type I and type II errors** and their importance Students will learn hypothesis testing in general and the decision rules for different situations.

CO6: Students will be able to handle the situation of testing for non- normal data.

DSC-VIII SQC and LPP (BST4T08)

CO1: Students will be able to understand the concept of **SQC** and their different **Causes.**

CO2: Students will familiar with the **techniques** of SQC (**Process and Product Control**)

CO3: Use tools of SQC, Draw **control charts for mean, standard deviation and range.**

CO4: Draw conclusion about whether process is in statistical quality control or not.

CO5: Understand **Acceptance Sampling** concepts, **Single** and **double** sampling

CO6: Students will understand the concept of **LPP** and general form of LPP and

Standard form of an LPP

CO7: Understand concept of **Optimum solution of LPP**

CO8: Solve Linear Programming problem using **Graphical method and Simplex Method**.