



FIRST-YEAR OF BACHELOR OF SCIENCE MINOR MATHEMATICS REVISED SYLLABUS ACCORDING TO CBCS NEP2020

COURSE TITLE: DESCRIPTIVE STATISTICS AND
INTRODUCTION TO PROBABILITY SEMESTER-II,
W.E.F. 2023-2024

**RECOMMENDED BY THE BOARD OF STUDIES IN MATHEMATICS
AND**

APPROVED BY THE ACADEMIC COUNCIL

Devrukh Shikshan Prasarak Mandal's

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal.Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: _____

| | | |
|---|---|--|
| Name of the Implementing Institute | : | Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804, |
| Name of the Parent University | : | University of Mumbai |
| Name of the Programme | : | Bachelor of Science |
| Name of the Department | : | Mathematics |
| Name of the Class | : | First Year |
| Semester | : | Second |
| No. of Credits | : | 02 |
| Title of the Course | : | Descriptive Statistics and Introduction to Probability |
| Course Code | : | MTOE104 |
| Name of the Vertical in adherence to NEP 2020 | : | Generic (Open) Elective Courses |
| Eligibility for Admission | : | Any 12 th Pass seeking Admission to Degree programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra |
| Passing Marks | : | 40% |
| Mode of Assessment | : | Formative and Summative |
| Level | : | UG |
| Pattern of Marks Distribution for TE and CIA | : | 60:40 |
| Status | : | NEP-CBCS |
| To be implemented from Academic Year | : | 2023-2024 |
| Ordinances /Regulations (if any) | | |

Syllabus for First Year of Bachelor of Science in Mathematics

(With effect from the academic year 2023-2024)

SEMESTER-II

Paper No. –

Course Title: Descriptive Statistics and Introduction to Probability No. of Credits - 02

Type of Vertical: Generic (Open) Elective Courses

COURSE CODE: MTOE104

Learning Outcomes Based on BLOOM's Taxonomy:

After completing the course, the learner will be able to...

| Course Learning Outcome No. | Blooms Taxonomy | Course Learning Outcome |
|-----------------------------|-----------------|---|
| CLO-01 | Remember | Data types, Data presentation, raw moments, central moments, Random experiment, sample space, events types and operations of events |
| CLO-02 | Understand | Measures of Central tendency, Measures dispersion and Correlation and Regression |
| CLO-03 | Apply | Conditional probability and Bayes' theorem to solve problems |

Syllabus for First Year of Bachelor of Science in Mathematics

(With effect from the academic year 2023-2024)

SEMESTER-II

Paper No.

Course Title: Descriptive Statistics and Introduction to Probability No. of Credits - 02

Type of Vertical: Generic (Open) Elective Courses

COURSE CODE: MTOE104

| Module No. | Content | No. of Lectures |
|------------|---|-----------------|
| 1 | <p>Data Presentation Data types : attribute, variable, discrete and continuous variable Data presentation : frequency distribution, histogram o give, curves, stem and leaf display</p> <p>Data Aggregation Measures of Central tendency: Mean, Median, mode for raw data, discrete, grouped frequency distribution. Measures dispersion: Variance, standard deviation, coefficient of variation for raw data, discrete and grouped frequency distribution, quartiles, quantiles Real life examples</p> | 10 |
| 2 | <p>Moments: raw moments, central moments, relation between raw and central moments</p> <p>Measures of Skewness and Kurtosis: based on moments, quartiles, relation between mean, median, mode for symmetric, asymmetric frequency curve.</p> <p>Correlation and Regression: bivariate data, scatter plot, correlation, nonsense correlation, Karl pearson"s coefficients of correlation, independence.</p> <p>Linear regression: fitting of linear regression using least square regression, coefficient of determination, properties of regression coefficients (only statement)</p> | 10 |
| 3 | <p>Probability Random experiment, sample space, events types and operations of events</p> <p>Probability definition : classical, axiomatic, Elementary Theorems of probability (without proof)</p> <ul style="list-style-type: none"> • $0 \leq P(A) \leq 1$ • $P(A \cup B) = P(A) + P(B) - (A \cap B)$ • $P(A') = 1 - P(A)$ • $P(A) \leq P(B)$ if A subset Of B <p>Conditional probability, „Bayes“ theorem, independence, Examples on Probability</p> | 10 |
| Total | | 30 |

Required Previous Knowledge

Basic Knowledge mathematical calculations is necessary before starting to learn the course.

Access to the Course

The course is available for all the students admitted for Bachelor of Science as a Generic (Open) Elective Course.

Forms of Assessment

The assessment of the course will be of Diagnostic, Formative and Summative type. At the beginning of the course diagnostic assessment will be carried out. The formative assessment will be used for the Continuous Internal Evaluation whereas the summative assessment will be conducted at the end of the term. The weightage for formative and summative assessment will be 60:40. The detailed pattern is as given below.

Term End Evaluation (30 Marks)

Question Paper Pattern

Time: 1 hours

| Question No. | Question Pattern | Marks |
|--------------|--|-----------|
| Q.1 | Short Answer Questions (based on Unit I) | 10 |
| Q.2 | Short Answer Questions (based on Unit II) | 10 |
| Q.3 | Short Answer Questions (based on Unit III) | 10 |
| Total | | 30 |

Internal evaluation (20 Marks)

| Sr. No. | Description | Marks |
|--------------|---|-----------|
| 1 | Mid Term Examination | 10 |
| 2 | Active Participation in teaching learning Process | 5 |
| 3 | Subject related activities as assigned by the teacher | 5 |
| Total | | 20 |

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

References:

Trivedi, K.S.(2001) : Probability, Statistics, Design of Experiments and Queuing theory, with applications of Computer Science, Prentice Hall of India, New Delhi

Text book: • Techmax publication book

Additional References:

- Ross, S.M. (2006): A First course in probability. 6th Edⁿ Pearson

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce and Vid. Dadasaheb Pitre Science College, Devrukh (An Autonomous College Affiliated with University of Mumbai)

- Kulkarni, M.B., Ghatpande, S.B. and Gore, S.D. (1999): common statistical tests. Satyajeet Prakashan, Pune
- Gupta, S.C. and Kapoor, V.K. (1987): Fundamentals of Mathematical Statistics, S. Chand and Sons, New Delhi
- Gupta, S.C. and Kapoor, V.K. (1999): Applied Statistics, S. Chand and Son's, New Delhi
- Montgomery, D.C. (2001): Planning and Analysis of Experiments, wiley.