Rayat Shikshan Sanstha's

SADGURU GADAGE MAHARAJ COLLEGE, KARAD

(An Autonomous College)

Revised Syllabus

Bachelor of Science

Part II

STATISTICS (SEC)

Choice Based Credit System (CBCS) as per NEP - 2020

Syllabus Implemented w. e. f. June, 2024

B.Sc. II (Semester-III)

SEC- II SECS23-301
Data Analysis with R Programming - I
Credits:02

Course Outcomes: The students will acquire knowledge of

i) To understand programming fundamentals of R language
ii) To understand various data import methods in R
iii) To understand data manipulation in R
iv) To create visualizations and plots using R

Unit 1 : (1 Credit)

1.1: Fundamental of R--

- Introduction of R
- R Environment
- Installation of R Software
- Starting and Ending R
- Getting Help
- Importing of Data
- Vectors and Vector arithmetic
- Seq(), rep (), combine, numeric function
- Data frame, resident datatype

1.2: Diagrams and Graphs--

- Classification
- Diagrammatic Representation of Data
- Graphical Representation of data
- Exercise

1.3: Sampling Methods --

- Population and Samples
- Simple random sampling
- Stratified random sampling
- Systematic random sampling
- Simulation
- Exercise

Unit 2 : (1 Credit)

2.1: Descriptive Statistics

- Central Tendency
- Discrete Observation
- Ungrouped frequency distribution
- Grouped frequency distribution
- Exercise
- Introduction of measure of dispersion
- Measures of dispersion
- Exercise

Reference Books

1. Statistics Using R – Sudha G. Purohit, Sharad Gore, Shailaja Deshmukh.
2. V.R. Pawagi and Saroj A. Ranade (2010) - Statistical methods using R software, Nirali. Publications.

B.Sc. II (Semester-III)

SEC- III SECS23-302
Data Analysis with R Programming – I
Credits:02

Course Outcomes: The students will acquire knowledge of

i)The programming fundamentals of R language
ii) The understand various data import methods in R
iii) The understand data manipulation in R
iv) The create visualizations and plots using R
v) The understand and implement basic Statistics and Various statistical methods.

Practical

1. Data Input
2. Diagrammatic Representation
3. Graphical Representation
4. Measures of Central Tendency(Ungrouped Data)
5. Measures of Central Tendency(Grouped Data)
6. Measures of Dispersion (Ungrouped Data)
7. Measures of Dispersion (Ungrouped Data)
8. Sampling Methods
9. Sketching of c. d. f. / p.d.f.

Laboratory Requirements:

Laboratory should be well equipped computers along with R software, UPS, and Printers.

B.Sc. II (Semester-IV)

SEC- IV SECS23-401
Data Analysis with R Programming – II
Credits:02

Course Outcomes: The students will acquire knowledge of

i) To understand Probability and probability distribution.
ii) To understand Correlation, Regression and ANOVA in R
iii) To understand and implement basic Statistics and Various statistical methods.

Unit 1 : (1 credit)

1.1: Fitting and model sampling of probability distribution using R

- Probability
- Binomial Distribution
- Hypergeometric Distribution
- Poisson distribution
- Normal distribution
- Uniform Distribution
- Exponential Distribution
- Exercise

1.2: Correlation, Regression using R

- Correlation
- Types of Correlation
- Regression
- Regression Diagnostics by Graphical Method
- Multiple Regression and Correlation
- Exercise

Unit 2 : (1 credit)

2.1: Tests of Hypothesis using R

- Introduction
- Large Sample Tests
- Small Sample Tests
- Tests: t-test, F-tests and tests of proportions
- Chi-squares test for independence of attributes
- Chi-square test for goodness of fit
- Exercise

2.2: Programming in R

- Statements for writing program in R
- If statements, If----else, for statement, while loop, break etc.
- Simple programs in R
- Exercise

Reference Books

1. Statistics Using R – Sudha G. Purohit, Sharad Gore, Shailaja Deshmukh.
2. V.R. Pawagi and Saroj A. Ranade (2010) - Statistical methods using R software, Nirali. Publications.

B.Sc. II (Semester-IV)

SEC- V SECS23-402
Data Analysis with R Programming – II
Credits:02

Course Outcomes: The students will acquire knowledge of

i) To solve problems on Probability and probability distribution.
ii) To solve problems on Correlation, Regression in R
iii) To solve problems on testing of hypothesis.

Practical

1. Fitting of Discrete Distribution
2. Fitting of Continuous Distribution
3. Model sampling of Discrete Distributions
4. Model sampling of Continuous Distributions
5. Correlation (Ungrouped Data)
6. Correlation (Grouped Data)
7. Regression (Ungrouped Data)
8. Regression (Grouped Data)
9. Large sample Test
10. Small Sample Test

Laboratory Requirements:

Laboratory should be well equipped computers along with R software, UPS, and Printers.