S. P. Mandali's

Ramnarain Ruia Autonomous College

(Affiliated to University of Mumbai)

Syllabus for

Program: F.Y.B.A.

Program Code: RUASTA

(As per the guidelines of National Education Policy 2020-
Academic year 2023-24)

(Choice based Credit System)

Course Code- Skill Enhancement Course : RUASECSTA.O101

Course Title: Data Condensation and Visualisation Techniques
Academic year 2023-24

COURSE OUTCOMES:

COURSE OUTCOME	DESCRIPTION A student completing this course will be able to:
CO 1	Identify and differentiate between various scales of measurement. Contrast different types of data and elucidate the methods utilized for data collection.
CO 2	Elucidate the definition and elucidate the interrelation between Yule's coefficient of association Q and Yule's coefficient of Colligation Y concerning two attributes.
CO 3	Develop Univariate and Bivariate frequency distributions for discrete and continuous variables along with Cumulative frequency distributions. Illustrate these distributions through graphical representations including Histograms, Polygons/Curves, Ogives, Heat Maps, and Tree Maps

DETAILED SYLLABUS

Course Code	Unit	Course/ Unit Title	No. of Hours
RUASECSTA.O101	**Unit I**	**Types of Data and Data Condensation:** • Concept of Population and Sample. Finite, Infinite Population, Notion of SRS, SRSWOR and SRSWR • Different types of scales: Nominal, Ordinal, Interval and Ratio. • Methods of Data Collection: i) Primary data: concept of a Questionnaire and a Schedule, ii) Secondary Data • Types of data: Qualitative and Quantitative Data; Time Series Data and Cross Section Data, Discrete and Continuous Data • Univariate frequency distribution of discrete and continuous variables. Cumulative frequency distribution, Tabulation • Data Visualization: Graphs and Diagrams: Histogram, Polygon/curve, Ogives. Heat Map, Tree map.	15 Hours

		• Bivariate Frequency Distribution of discrete and continuous variables **ASSOCIATION** • Dichotomous classification- for two and three attributes, Verification for consistency • Association of attributes: Yule's coefficient of association Q. Yule's coefficient of Colligation Y, Relation between Q and Y	

References:

1. Medhi J.: "Statistical Methods, An Introductory Text", Second Edition, New Age International Ltd.
2. Agarwal B.L.: "Basic Statistics", New Age International Ltd.
3. Spiegel M.R.: "Theory and Problems of Statistics", Schaum's Publications series. Tata McGraw-Hill.
4. Kothari C.R.: "Research Methodology", Wiley Eastern Limited.
5. David S.: "Elementary Probability", Cambridge University Press.
6. Hoel P.G.: "Introduction to Mathematical Statistics", Asia Publishing House.
7. Hogg R.V. and Tannis E.P.: "Probability and Statistical Inference". McMillan Publishing Co. Inc.
8. Pitan Jim: "Probability", Narosa Publishing House.
9. Goon A.M., Gupta M.K., Dasgupta B.: "Fundamentals of Statistics", Volume II: The World Press Private Limited, Calcutta.
10. Gupta S.C., Kapoor V.K.: "Fundamentals of Mathematical Statistics", Sultan Chand &Sons
11. Gupta S.C., Kapoor V.K.: "Fundamentals of Applied Statistics", Sultan Chand & Sons

Work Load of Practical

Course	PRACTICALS	Credits	Hours / Week
RUASECSTAP.O101	**Practical based on** RUASECSTA.O101	1	2

Practical on SEC (1 Credit)

1. Univariate Frequency and Bivariate Frequency Classification and Tabulation
2. Frequency Curve and Frequency Polygon
3. Graphs:- Histogram
4. Graphs:- Cumulative Frequency distribution
5. Simple Bar Diagrams
6. Multiple Bar Diagrams
7. Subdivided Bar Diagrams
8. Pie Diagram
9. Association between attributes

10. Graphical representation using Excel
11. Revision 1
12. Revision 2

Course Code- Skill Enhancement Course: RUASECSTA.E111
Course Title: Introduction to R Programming

Academic year 2023-24

COURSE OUTCOMES:

COURSE OUTCOME	DESCRIPTION A student completing this course will be able to:
CO 1	Use the basic mathematical operators in R for different data types.
CO 2	Apply different data management techniques and data visualisation

DETAILED SYLLABUS

Course Code	Unit	Course/ Unit Title	No. of Hours
RUASECSTA.E111	**Unit I**	Fundamentals of R: • Introduction to R, features of R, installation of R, Starting and ending R session, getting help in R, Value assigning to variables, • Basic Operations: +, -, *, ÷, ^, sqrt, Numerical functions: log 10, log, sort, max, unique, range, length, var, prod, sum, summary, dim, sort, five num etc. • Data Types: Vector, list, matrices, array and data frame, Variable Type: logical, numeric, integer, complex, character and factor Data • Processing: Data import and export, setting working directory, checking structure of Data: Str(), Class(), Changing type of variable (for eg. as. factor, as numeric) • Manipulations:- Selecting random N rows, removing, duplicate row(s), dropping a variable(s), Renaming variable(s), sub setting data, creating a new variable(s), appending of row(s) and column(s) • Data Visualization : Simple bar diagram, subdivided bar diagram, multiple bar diagram pie diagram, Box plot for one and more variables, histogram	15 hours

Work Load of Practical

Course	PRACTICALS	Credits	Hours / Week
RUASECSTAP.E111	**Practical based on** RUASECSTA.E111	**1**	**2**

Distribution of Practical on SEC (1 Credit)

1. Basic Operations in R
2. Data type list
3. Data type Matrix
4. Data type Data frame
5. Data Manipulations
6. Histogram
7. Frequency distribution
8. Simple Bar Diagrams
9. Multiple Bar Diagrams
10. Sub-divided Bar Diagrams)
11. Box Plot
12. Pie Diagram

References:

1. Statistical methods using R software by Vishwas Pawgi and Saroj Ranade by Nirali Prakashan

2. Statistics using R by Sudha G purohit, Sharad D Gore, Shailaja R Deshmuskh, Narosa Publishing House Delhi

Modality of Assessment: Skill Enhancement Course

(1 Credit Theory Course)

A) Internal Assessment- 10 Marks

Sr. No	Evaluation type	Marks
1	Class Test/ Project / Assignment / Open book test	10
	TOTAL	**10**

B) External Examination (Semester End)- 15 Marks
Semester End Theory Examination:
1. Duration – The duration for these examinations shall be of **30 min**.
2. Theory question paper pattern:

Paper Pattern:

Question	Options	Marks	Questions Based on
1	3 out of 5	15	Unit I
	TOTAL	**15**	

C) Practical Examination Pattern:

   Practical Examination Total Marks   ……... **50 Marks**.

  (i)   Journal and attendance   ……… **5 Marks**

  (ii)   At the end of the semester, examination of **2 hours** duration and **45 marks**
     shall be held for the **course**.

1. Practical paper will consist of **FIVE questions**.
2. Learners to attempt **THREE questions**.

PRACTICAL JOURNAL

The students are required to present a duly certified journal for appearing at the practical examination, failing which they will **not be allowed to appear for the examination. The journals will be certified if the student attends 75% practical.**
In case of loss of Journal and/or Report, a Lost Certificate should be obtained from Head/ Co-ordinator / In charge of the department; failing which the student will not be allowed to appear for the practical examination.

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