

**S. P. Mandali's**  
**Ramnarain Ruia Autonomous College**  
*(Affiliated to University of Mumbai)*



**Syllabus for**

**Program: F.Y.B.Sc.**

**Program Code: RUSSTA**

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

(Choice based Credit System)

**Course Code- Vocational and Skill Enhancement Course:**  
**RUSVSCSTA.E111**  
**Course Title: Introduction to R Programming**  
**Academic year 2023-24**

**COURSE OUTCOMES:**

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

**DETAILED SYLLABUS**

Course Code	Unit	Course/ Unit Title	No. of Hours
RUSVSCSTA.E111	<b>Unit I</b>	Fundamentals of R: <ul style="list-style-type: none"> <li>• Introduction to R, features of R, installation of R, Starting and ending R session, getting help in R, Value assigning to variables,</li> <li>• Basic Operations: +, -, *, ÷, ^, sqrt, Numerical functions: log 10, log, sort, max, unique, range, length, var, prod, sum, summary, dim, sort, five num etc.</li> <li>• Data Types: Vector, list, matrices, array and data frame, Variable Type: logical, numeric, integer, complex, character and factor Data</li> <li>• Processing: Data import and export, setting working directory, checking structure of Data: Str(), Class(), Changing type of variable (for eg. as. factor, as numeric)</li> <li>• 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)</li> <li>• Data Visualization : Simple bar diagram, subdivided bar diagram, multiple bar diagram pie diagram, Box plot for one and more variables, histogram</li> </ul>	15 hours

## Work Load of Practical

Course	PRACTICALS	Credits	Hours / Week
RUSVSCSTAP.E111	Practical based on RUSVSCSTA.E111	1	2

### Distribution of Practical on VSC (1 Credit)

1. Basic Operations in R
2. Data type list
3. Data type Matrix
4. Data type Dataframe
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:

#### 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 Deshmukh, Narosa Publishing House Delhi

### Modality of Assessment: Vocational and 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
	<b>TOTAL</b>	<b>10</b>

#### 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
	<b>TOTAL</b>	<b>15</b>	

### C) Practical Examination Pattern:

Practical Examination ..... **50 Marks.**

Journal and attendance ..... **5 Marks**

At the end of the semester, examination of **2 hours** duration and **50 marks** shall be held for the **course**.

1. Practical paper will consist of **two questions**.
2. Every **question** will consist of **four sub-questions** based on the Unit
3. Learners to attempt **one question**.

#### **PRACTICAL JOURNAL (5 marks)**

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% practicals.**

**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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