

**"Education through self-help is our motto"- KARMAVEER
RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS**

Organized
Computation of Statistics using R-Software
Self – Funded under Short Term Courses in the academic year 2025-26

COURSE REPORT

Department of statistics organized the certificate course on computation of statistics using open source software for B.Sc.III students for the academic year 2025-26. The main objectives of this course are:

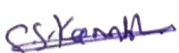
- To learn R-software and how to use it for effective exploratory data analysis.
- To learn number of data types, data structures, various operators
- To learn syntax of various loops
- To learn various inbuilt functions
- To learn how to simulate data from various distributions
- To learn analysis of one-way and two-way analysis of data

For this course fee of Rs.500 charged to the students. The course was conducted in the period of 29/09/2025 to 15/10/2025. Total number of beneficiaries for this course is 11. After completion of this course student's knowledge was checked through various computation tasks through assignments. Each student who successfully completed this course was awarded by certificate. Dr. Kurane T.S., Kamble S.S. (co-ordinator) and Smt. Gadhari G.A. worked as a Resource person for this course.

Outcomes: The students shall become confident and equipped with all the knowledge requires to perform analytical activities using R

Total number of beneficiaries is 11.




Mr. S.S. Kamble
Coordinator


Dr. T.S. Kurane
Head
Department of
Statistics


Dr. D.S. Kumbhar
Incharge,
Short term Courses

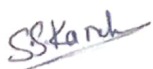

Dr. U. S. Shelke
IQAC
Coordinator

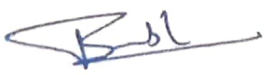

Prof. Dr. D. R. Bhosale
I/C Principal
R. C. Shahu College,
Kolhapur



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 Rayat Shikshan Sanstha's
Rajarshi Chhatrapati Shahu College, Kolhapur
Department of Statistics
 Organized
Certificate Course on Computation of Statistics using R-Software
 (Self – Funded)
 Under
 Short Term Courses
 2025-2026
Income and Expenditure Statement

Income	Amount (in Rs.)	Expenditure	Amount (in Rs.)
Particulars		Particulars	
1) Total Participants = 11 (11*500)	5500/-	1) GST 18%	990/-
		2) Certificate Printing	169/-
		2) Remuneration for Recourse Person Lumsum (40% of Total amount 4510/- is 1804/- is equally distributed into 2 persons+ certificate printing)	
		i) Mr. Kamble S. S.	818/-
		ii) Smt. Gadhari G. A.	818/-
		3) Balance to College	2705/-
Total	5500=00	Total	5500=00


Mr. S.S. Kamble
 Coordinator


Dr. T.S. Kurane
 Head
 Department of Statistics


Dr. D.S. Kumbhar
 Incharge
 Short term Courses


Prof. Dr. D. R. Bhosale
 I/C Principal
 R. C. Shahu College, Kolhapur



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Rayat Shikshan Sanstha's



RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR

NAAC 4th Cycle Reaccredited with A++ (CGPA- 3.78)



DEPARTMENT OF STATISTICS



This is to certify that Prof./Shri/Smt Bhole Vidyanani Dhondiram of
Rajarshi Chhatrapati Shahu College, Kolhapur has attended and participated / Delivered a Lecture as Resource Person/
Successfully completed Certificate Course in **Computation of Statistics using R- Software** organized by Department of
Statistics Rajarshi Chhatrapati Shahu College, Kolhapur from 29/09/2025 to 15/10/2025


Mr. S. S. Kamble
Co-ordinator
Dept. of Statistics

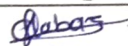
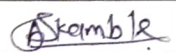
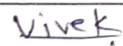
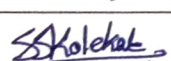
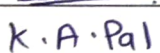
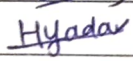

Dr. T. S. Kurane
HOD
Dept. of Statistics


Dr. D. S. Kumbhar
In charge
Short term Courses


Dr. U. S. Shelke
IQAC
Coordinator


Prof. Dr. D. R. Bhosale
I/C Principal,
R. C. Shahu College, Kolhapur.

**RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHTRPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS
Computation of Statistics using R-Software
2025-26
List of Students**

Roll No.	Name of Student	Fee	Sign
1	Babar Omkar Sanjay	500	
2	Bhole Vidyarani Dhondiram	500	
3	Borgave Om Ajit	500	
4	Jondhlekar Sneha Krishnat	500	
5	Kamble Arjun Sunil	500	
6	Koigade Vivek Maruti	500	
7	Kolekar Samruddhi Sachin	500	
8	Pal Kusum Amarjeet	500	
9	Pokale Samiksha Suresh	500	
10	Powar Divya Baburao	500	
11	Yadav Harsh Nivas	500	


Head
Department of Statistics
Rajarsi Chh. Shahu College, Kolhapur




TIC PRINCIPAL
R.C. SHAHU COLLEGE
KOLHAPUR

**RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHTRPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS**

B.Sc. III (2025-26)

Certificate Course Exam on Computation of Statistics using R-Software

Time – 1 Hour

Marks – 50

Name of Student –

Roll No

Q. Choose Correct Alternative :

(50)

- 1) Elementary commands in R consist of either _____ or assignments.
a) utilstats b) language c) expressions d) packages
- 2) What is the simplest way of creating the vector?
a) C function b) Create c) Destroy d) Invalid
- 3) What will be the output of the following R program?
 r<-0:10
 r[2]
a) 0 b) 1 c) 2 d) 3
- 4) What is NaN called?
a) Not a Number b) Not a Numeric
c) Number and Number d) Number a Numeric
- 5) Which of the following is used for Statistical analysis in R language?
a) RStudio b) Studio c) Heck d) KStudio
- 6) Which function is used to check for missing values in R?
a) is.null() b) is.na() c) na.rm() d) null.check()
- 7) R was created by?
a) Ross Ihaka b) Robert Gentleman c) Both A and B d) Ross Gentleman
- 8) Which of the following command is used to print an object "x" in R?
a) printf(x) b) print(x) c) printx d) print[x]
- 9) What is the meaning of "<-"?
a) Functions b) Loops c) Addition d) Assignment
- 10) What will be the output of the following R code?
 > x <- 6
 > class(x)
a) "integer" b) "numeric" c) "real" d) "imaginary"
- 11) Which of the following is default prompt for UNIX environment
a) > b) >> c) < d) <<
- 12) R is technically much closer to the Scheme language than it is to the original _____ language.
a) B b) C c) C++ d) S



- 13) Which of the following is true about R?
 - a) It is a programming language for statistical computing
 - b) It provides data visualization tools
 - c) It is open-source software
 - d) All of the above
- 14) Which command is used to install a package in R?
 - a) `install.package( )`
 - b) `install.packages( )`
 - c) `library( )`
 - d) `require( )`
- 15) Which function is used to create a sequence of numbers?
 - a) `seq( )`
 - b) `rep( )`
 - c) `sequence( )`
 - d) `num( )`
- 16) What is the data type of TRUE and FALSE in R?
 - a) Character
 - b) Logical
 - c) Integer
 - d) Numeric
- 17) What is the default data structure in R?
 - a) Vector
 - b) Matrix
 - c) Data frame
 - d) List
- 18) What does the function `dim( )` return when applied to a matrix?
 - a) Number of elements in the matrix
 - b) Number of rows and columns
 - c) Number of columns only
 - d) Number of rows only
- 19) Which of the following is NOT a loop structure in R?
 - a) for
 - b) repeat
 - c) do-while
 - d) while
- 20) Which of the following graphs we can draw in R?
 - a) Histogram
 - b) Frequency Curve
 - c) Normal Probability Plot
 - d) All the above
- 21) What is the purpose of the `apply( )` function in R?
 - a) Apply a function over rows or columns of a matrix
 - b) Apply a function to a list element
 - c) Apply a function over elements of a vector
 - d) Apply a function over a data frame
- 22) What is the correct syntax to create a data frame in R?
 - a) `data.frame(name = c("Abhi", "Balu"), age = c(25, 30))`
 - b) `frame.data("name", "age", values = c("A", "B", 25, 30))`
 - c) `data.table("name", "age", c("A", "B"), c(25, 30))`
 - d) `table.data("A", 25, "B", 30)`
- 23) What is the output of `mean(c(NA, 1, 3), na.rm = TRUE)`?
 - a) NA
 - b) 1.5
 - c) 1
 - d) 2
- 24) Which function is used to concatenate elements in R?
 - a) `cbind( )`
 - b) `cat( )`
 - c) `paste( )`
 - d) `c( )`
- 25) Which function is used to display the structure of an object in R?
 - a) `summary( )`
 - b) `structure( )`
 - c) `str( )`
 - d) `show( )`



Q. No	Answer
1	c) expressions
2	a) C function
3	b) 1
4	b) Not a Numeric
5	a) RStudio
6	b) is.na()
7	a) Ross Ihaka
8	b) print(x)
9	d) Assignment
10	a) "integer"
11	a) >
12	d) S
13	d) All of the above
14	b) install.packages()
15	a) seq()
16	b) Logical
17	a) Vector
18	b) Number of rows and columns
19	c) do-while
20	d) All the above
21	a) Apply a function over rows or columns of a matrix
22	a) data.frame(name = c("Abhi", "Balu"), age = c(25, 30))
23	d) 2
24	d) c()
25	c) str()



**RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHTRPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS
Computation of Statistics using R-Software**

2025-26

Result of Students

Roll No.	Name of Student	Class	Marks
1	Babar Omkar Sanjay	B.Sc. III	46
2	Bhole Vidyarani Dhondiram	B.Sc. III	30
3	Borgave Om Ajit	B.Sc. III	40
4	Jondhlekar Sneha Krishnat	B.Sc. III	34
5	Kamble Arjun Sunil	B.Sc. III	44
6	Koigade Vivek Maruti	B.Sc. III	32
7	Kolekar Samruddhi Sachin	B.Sc. III	44
8	Pal Kusum Amarjeet	B.Sc. III	40
9	Pokale Samiksha Suresh	B.Sc. III	42
10	Powar Divya Baburao	B.Sc. III	44
11	Yadav Harsh Nivas	B.Sc. III	32




Head
Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur

**RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS**

“Computation of Statistics using R Software”

B. Sc. III

2025-26

ROLL NO	NAME OF STUDENT	DATE									
		29/9/25	30/9/25	1/10/25	3/10/25	4/10/25	5/10/25	6/10/25	7/10/25		
1	Babar Omkar Sanjay	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
2	Bhole Vidyarani Dhondiram	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
3	Borgave Om Ajit	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
4	Jondhlekhar Sneha Krishnat	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
5	Kamble Arjun Sunil	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
6	Koigade Vivek Maruti	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
7	Kolekar Samruddhi Sachin	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
8	Pal Kusum Amarjeet	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
9	Pokale Samiksha Suresh	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
10	Powar Divya Baburao	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi
11	Yadav Harsh Nivas	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi	Shaharshi

Head

**Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur**



Principal

**Principal
R.C. SHAHU COLLEGE
KOLHAPUR**

**RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS**

“Computation of Statistics using R Software”

B. Sc. III

2025-26

ROLL NO	NAME OF STUDENT	8/10/25	9/10/25	10/10/25	13/10/25	14/10/25	15/10/25
1	Babar Omkar Sanjay	Shabas	Shabas	Shabas	Shabas	Shabas	Shabas
2	Bhole Vidyarani Dhondiram	(B)	(B)	(B)	(B)	(B)	(B)
3	Borgave Om Ajit	Shabas	Shabas	Shabas	Shabas	Shabas	Shabas
4	Jondhlekar Sneha Krishnat	(J)	(J)	(J)	(J)	(J)	(J)
5	Kamble Arjun Sunil	Kamble	Kamble	Kamble	Kamble	Kamble	Kamble
6	Koigade Vivek Maruti	Vivek	Vivek	Vivek	Vivek	Vivek	Vivek
7	Kolekar Samruddhi Sachin	Kolekar	Kolekar	Kolekar	Kolekar	Kolekar	Kolekar
8	Pal Kusum Amarjeet	K.A. Pal	K.A. Pal	K.A. Pal	K.A. Pal	K.A. Pal	K.A. Pal
9	Pokale Samiksha Suresh	Pokale	Pokale	Pokale	Pokale	Pokale	Pokale
10	Powar Divya Baburao	Powar	Powar	Powar	Powar	Powar	Powar
11	Yadav Harsh Nivas	Hyadav	Hyadav	Hyadav	Hyadav	Hyadav	Hyadav

B.B.

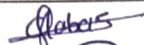
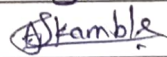
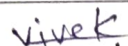
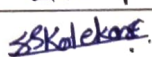
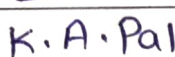
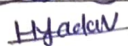
Head

Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur



**HC PRINCIPAL
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KOLHAPUR**

RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHTRPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS
Computation of Statistics using R-Software
2025-26
List of Students

Roll No.	Name of Student	Sign
1	Babar Omkar Sanjay	
2	Bhole Vidyarani Dhondiram	
3	Borgave Om Ajit	
4	Jondhlekar Sneha Krishnat	
5	Kamble Arjun Sunil	
6	Koigade Vivek Maruti	
7	Kolekar Samruddhi Sachin	
8	Pal Kusum Amarjeet	
9	Pokale Samiksha Suresh	
10	Powar Divya Baburao	
11	Yadav Harsh Nivas	


Head
 Department of Statistics
 Rajarshi Chh. Shahu College, Kolhapur



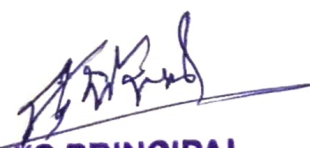

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KOLHAPUR

**RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHTRPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS
Organized,
Computation of Statistics using R-Software
On 2025-26
Enrollment List**

Roll No.	Name of Student	Fee	Receipt No.	Sign
1	Babar Omkar Sanjay	500	8979	<i>Babar</i>
2	Bhole Vidyarani Dhondiram	500	8980	<i>B</i>
3	Borgave Om Ajit	500	8981	<i>Borgave</i>
4	Jondhlekar Sneha Krishnat	500	8982	<i>S</i>
5	Kamble Arjun Sunil	500	8983	<i>A. Kamble</i>
6	Koigade Vivek Maruti	500	8984	<i>Vivek</i>
7	Kolekar Samruddhi Sachin	500	8985	<i>S. Kolekar</i>
8	Pal Kusum Amarjeet	500	8986	<i>K. A. Pal</i>
9	Pokale Samiksha Suresh	500	8987	<i>Pokale</i>
10	Powar Divya Baburao	500	8988	<i>Powar</i>
11	Yadav Harsh Nivas	500	8989	<i>Yadav</i>
Total		5500		


Head
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Rajarsi Chh. Shahu College, Kolhapur




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KOLHAPUR

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RAJARSHI CHHTRPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS**

Organized

Computation of Statistics using R - software.
(Self - Funded Under COC)

Time Table 2025-26

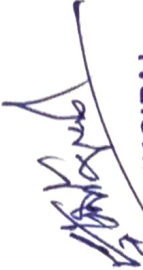
	Venue	Date		29/09/25	30/09/25	01/10/25	03/10/25	04/10/25	05/10/25	06/10/25	07/10/25
		Time									
Theory & Practical	Lab 1 (Stat.Lab)	11:00-12:00 & 12:00-02:00	SSK	GAG	SSK	GAG	SSK	SSK	SSK	GAG	SSK

	Venue	Date		08/10/25	09/10/25	10/10/25	11/10/25	13/10/25	14/10/25	15/10/25
		Time								
Theory & Practical	Lab 1 (Stat.Lab)	11:00-12:00 & 12:00-02:00	SSK	GAG	SSK	GAG	SSK	SSK	GAG	SSK

Sr. No.	Name of Lecturer		
1	SSK	Mr. Kamble S. S.	
2	GAG	Smt. Gadhari G.A.	


Head
Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur




PRINCIPAL
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**RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS
B.Sc. III (2025-26)**

NOTICE

Date: 10/09/2025

All students of B.Sc. III hereby informed that, your “**Computation of Statistics using R-Software**” organized by Department of Statistics, will be start from 29/09/2025. The course will be conducted in Statistics lab from 11:00 AM to 2:00 PM. All students are requested to attend the course regularly and actively participate.



A handwritten signature in purple ink, appearing to be "B. S. L.", written over a horizontal line.

Head
Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur



रयत शिक्षण संस्थेचे
राजर्षी छत्रपती शाहू कॉलेज, कोल्हापूर

शॉर्ट टर्म / सीओसी कोर्सेस फी आणि त्याच्या खर्चाबाबतचा ठराव
(शैक्षणिक वर्ष २०२५-२६)

प्रस्ताव : महाविद्यालयातील विद्यार्थ्यांनी पारंपरिक शिक्षणाबरोबरच विविध कौशल्ये आत्मसात करून त्यांनी आत्मनिर्भर व्हावे यासाठी चालू शैक्षणिक वर्षात महाविद्यालयात एकूण २० शॉर्ट टर्म कोर्स व इतर १६ कौशल्य आधारित आणि मूल्यवर्धित कोर्सेस राबविले जात आहेत. या कोर्सेस साठी महाविद्यालयातील विद्यार्थी प्रवेशित होत असतात. इंग्रजी विभागामार्फत चालवला जाणारा बॅश ब्रिज कोर्स (फी. रु. १०००/-) आणि संख्याशास्त्र विभागामार्फत चालविले जाणारे तीन कोर्सेस (फी. प्रत्येकी रु. ५००/-) वगळता इतर सर्व कोर्सेस साठी रु. ३००/- एवढी फी प्रति विद्यार्थी आकारली जाते. सदर प्रत्येक कोर्समधून जमा होणाऱ्या फी पैकी GST व प्रमाणपत्र खर्च वजाकरता उर्वरित रकमेच्या ४०% रक्कम कोर्सच्या मानधनासाठी खर्च करावी व ६०% रक्कम महाविद्यालयाच्या विकासासाठी खर्च करण्यात यावी. रयत शिक्षण संस्थेच्या परिपत्रकानुसार, चालू शैक्षणिक वर्षात कनिष्ठ आणि वरिष्ठ विभागामध्ये कृत्रिम बुद्धिमत्ता (AI) हा कोर्स सुरु करण्यात यावा व सदर कोर्ससाठी वरिष्ठ विभाग (रु. २०००/-) आणि कनिष्ठ विभाग (रु. १५००/-) अशी फी आकारण्यात यावी.

तांत्रिक माहिती: महाविद्यालयात कला, वाणिज्य, विज्ञान, बी.एस्सी.कॉम्प्युटर सायन्स, बी.एस्सी.कॉम्प्युटर सायन्स (बी.सी.एस.) तसेच एम.ए. इंग्लीश, एम.कॉम.(आय.टी). एम. एस्सी.केमिस्ट्री, एम. एस्सी. संख्याशास्त्र इ. विद्याशाखांमध्ये महाविद्यालयाचे शैक्षणिक कामकाज सुरू आहे. चालू शैक्षणिक वर्षात (२०२५-२६) मध्ये महाविद्यालयात एकूण १२८६ विद्यार्थ्यांनी प्रवेश घेतला आहे. तसेच विद्यार्थ्यांना विद्यापीठाच्या अभ्यासक्रमाव्यतिरिक्त त्यांच्या विषयाच्या अनुषंगाने तसेच इतर कौशल्य विकसित व्हावित यासाठी गेली अनेक वर्षे महाविद्यालयातील विद्यार्थिनींना खालील शॉर्ट टर्म व सी. ओ. सी. कोर्सेसची संधी उपलब्ध करून देण्यात आली आहे. यामध्ये

Sr.No	Course Name	Department	Fee
1	Preparation of Household chemicals	Chemistry	300/-
2	Understanding of Basic Electronics Devices	Physics	300/-
3	Biodiversity Conservation	Botany	300/-
4	Vermicomposting Technology	Zoology	300/-
5	Applications of Statistics using MS EXCEL	Statistics	300 -



6	Exploratory Data Analysis using MS-Excel	Statistics	300/-
7	Advanced Excel	Statistics	500/-
8	Computational Statistics using R- Software	Statistics	500/-
9	Computation of Statistics using open source Software	Statistics	500/-
10	वातमी लेखन	Marathi	300/-
11	अनुवाद सिद्धांत और प्रयोग	Hindi	300/-
12	Bosch- Bridge Course	English	1000/-
13	Surveying	Geography	300/-
14	Secretarial Training	Economics	300/-
15	Introducing forts in Maharashtra	History	300/-
16	Yoga & Meditation	Phy. Education	300/-
17	Entrepreneurship Development	Commerce	300/-
18	Basics to Share Market	Commerce IT	300/-
19	Artificial Intelligence	Sr. College	2000/-
20	Artificial Intelligence	Jr. College	1500/-

यासारखे कोर्सेस उपलब्ध करून दिले जातात. सदर शॉर्ट टर्म व सी. ओ. सी. कोर्सेस पूर्ण करून महाविद्यालयातील विद्यार्थी स्वतःचे व्यवसाय सुरू करून ते स्वावलंबी होऊ शकतात.

सदर कोर्सेस व्यतिरिक्त काही विभागांतर्गत १६ मूल्यवर्धित आणि कौशल्याधारित अभ्यासक्रम चालविले जातात, सदर कोर्सेस याही वर्षी सुरू ठेवण्यात यावेत; यासाठी कोणत्याही प्रकारची फी आकारली जात नाही.

Sr. No	Name of the Course	Name of the Department	Type of Course
01	Flower arrangement	Botany	VAC
02	Apiculture	Zoology	SBC
03	Mathematics to LaTeX	Mathematics	VAC
04	Artificial Intelligence	Computer Science	VAC
05	मुद्रित शोधन	Marathi	SBC
06	प्रयोजनमूलक हिन्दी	Hindi	VAC
07	TCS: Campus to Corporate	English	SBC
08	Tourism	Geography	VAC
09	Social Reformers in Maharashtra	Sociology	VAC
10	Indian Ethics	Philosophy	VAC
11	Consumer Rights	Economics	VAC
12	Work of women social reformers in Maharashtra	History	VAC
13	Panchayat Raj	Pol. Science	VAC
14	Positive Thinking & Emotional Intelligence	Psychology	VAC
15	Nutrition and Diet	Physical Education	VAC
16	Tally	Commerce	SBC



आर्थिक तरतूद : महाविद्यालयामध्ये प्रवेश घेतलेल्या विद्यार्थ्यांपैकी जे विद्यार्थी सदर कोर्सेस साठीही प्रवेश घेतात त्या विद्यार्थ्यांकडून प्रति विद्यार्थी प्रति कोर्स साठी रुपये ३००/- या प्रमाणे फी आकारली जाते सदर प्रत्येक कोर्समधून जमा होणाऱ्या फी पैकी GST व प्रमाणपत्र खर्च वजाकरता उर्वरित रकमेच्या ४०% रक्कम कोर्सच्या मानधना साठी खर्च करावी व ६०% रक्कम महाविद्यालयाच्या विकासासाठी खर्च करण्यास यावी.

कार्यालयाचे मत: महाविद्यालयामध्ये सुरू असलेले शॉर्ट टर्म व सी. ओ. सी. कोर्सेस हे विद्यार्थ्यांबरोबरच महाविद्यालयाच्या विकासासाठी उपयुक्त आहेत. या माध्यमातून अनेक विद्यार्थ्यांना आपले स्वतंत्र व्यवसाय सुरू केले आहेत. त्यामुळे सदर शॉर्ट टर्म कोर्सेसमधून विद्यार्थिनींच्या कौशल्याबरोबरच महाविद्यालयास चांगल्या प्रकारचे उत्पन्न प्राप्त होत असते. सदर उत्पन्नातून प्रत्यक्ष खर्च करण्यात येणाऱ्या ४०% रकमेचे खर्चाची विवरण खालील प्रमाणे करण्यात यावा

१. जमा होणाऱ्या फी पैकी GST व प्रमाणपत्र खर्च वजाकरता उर्वरित रकमेच्या ४०% रक्कम, व कोर्स अध्यापन, मानधन, स्टेशनरी, पुस्तके व अनुषंगिक इतर सर्व खर्च
२. जमा होणाऱ्या फी पैकी GST व प्रमाणपत्र खर्च वजाकरता उर्वरित रकमेच्या ४०% रक्कम वजा करता उर्वरित ६०% रक्कम महाविद्यालयात जमा करावी.

ठराव: महाविद्यालयाच्या सर्व विभागप्रमुख आणि कोर्स समन्वयक यांची मिटींग मा. प्राचार्य यांच्या उपस्थितीत दिनांक २५/०८/२०२५ रोजी पार पडली. सदर मिटींगमध्ये चर्चा करून सर्वानुमते महाविद्यालयामध्ये सुरू असलेले शॉर्ट टर्म व सी. ओ. सी. कोर्सेस हे विद्यार्थ्यांबरोबरच महाविद्यालयाच्या विकासासाठी उपयुक्त आहेत. त्यामुळे सदर शॉर्ट टर्म कोर्सेसमधून विद्यार्थ्यांच्या कौशल्याबरोबरच महाविद्यालयास चांगल्या प्रकारचे उत्पन्न प्राप्त होत असते. त्यामुळे सदर कोर्सेस चालू करावेत व प्रति कोर्सेसकरिता रुपये ३०० फी घ्यावी व त्या जमा होणाऱ्या एकूण फी च्या मधून GST व प्रमाणपत्र खर्च वजाकरता उर्वरित रकमेच्या ४०% रक्कम ही कोर्स अध्यापन, मानधन, स्टेशनरी, पुस्तके व अनुषंगिक इतर बाबींवर खर्च करावी व उर्वरित उर्वरित ६०% रक्कम महाविद्यालयात जमा करावी. असे सर्वानुमते ठरले. सदर मीटिंग करिता खालील विभाग प्रमुख उपस्थितीत होते.

सूचक: प्रो. डॉ. एम. बी. देसाई

अनुमोदक: प्रो. डॉ. पी. बी. पिस्टे

ठराव सर्वानुमते मंजूर.....



सदर मिटिंग करिता खालील विभागप्रमुख उपस्थितीत होते,

अ. क्र.	विभागप्रमुखाचे नाव	विभाग	सही
01	प्रो. डॉ. पिस्टे पी. बी.	रसायनशास्त्र	
02	प्रो. डॉ. देसाई एम. बी.	अर्थशास्त्र	
03	प्रो. डॉ. खोले एस. सी.	इतिहास	
04	डॉ. उबाळे ए. पी.	मराठी	
05	प्रो. डॉ. पाटील एम. ए.	इंग्रजी	
06	डॉ. लंवगारे जी. एम.	शारीरिक शिक्षण	
07	श्रीमती. मुलाणी एस. पी.	तत्वज्ञान	
08	डॉ. पाटील आर. सी.	हिन्दी	
09	श्रीमती. पुदाले पी. डी.	कॉमर्स	
10	डॉ. पालकर जे. एम.	भूगोल	
11	डॉ. परिट पी. डी.	मानसशास्त्र	
12	डॉ. शेख एस. डी.	वनस्पतीशास्त्र	
13	डॉ. कुंभार डी. एस.	प्राणिशास्त्र	
14	डॉ. कुरणे टी. एस.	संख्याशास्त्र	
15	डॉ. पाटील ए. आर.	भौतिकशास्त्र	
16	श्री. शेडगे एस. डी.	गणित	
17	श्रीमती. माळवेकर डी. ए.	सूक्ष्मजीवशास्त्र	
18	श्रीमती. शेख झेड. जे.	संगणकशास्त्र	

समन्वयक

शॉर्ट टर्म कोर्से कमिटी

प्राचार्य

राजर्षी छत्रपती शाह कॉलेज, कोल्हापूर

I/C PRINCIPAL

R.C. SHAHU COLLEGE

KOLHAPUR





Rayat Shikshan Sanstha's

**RAJARSHI CHHATRAPATI SHAHU COLLEGE,
KOLHAPUR**

Tal. Karveer, Dist. Kolhapur, 416003

{NAAC Accredited 'A++' Grade (CGPA 3.78) / ISO 9001:2015 Certified}

DEPARTMENT OF STATISTICS

Skill-Based Short Term Course on

“Computation of Statistics using R-Software”



Syllabus & Course Information

SKILL BASED SHORT TERM COURSE ON

“Computation of Statistics using R-Software”

Introduction:

R is a free and open-source statistical software and programming language widely used for data analysis, statistical modeling, visualization, and research. It was developed by Ross Ihaka and Robert Gentleman and is maintained by the R Foundation for Statistical Computing. R is especially popular among statisticians, data scientists, economists, researchers, and academicians.

R provides a rich environment for data manipulation, descriptive statistics, probability distributions, hypothesis testing, regression analysis, time series analysis, multivariate analysis, and machine learning. One of the strongest features of R is its package system (CRAN), which offers thousands of user-contributed packages for specialized statistical techniques.

R supports high-quality graphical representation, including histograms, boxplots, scatter plots, bar charts, and advanced visualizations. It is also platform-independent, meaning it runs on Windows, Linux, and macOS. Because of its flexibility, reproducibility, and strong statistical capabilities, R is widely used in academic courses, government research, industry analytics, and competitive examinations. Learning R helps students develop computational thinking and apply statistical concepts to real-world data problems.

PROGRAMME OUTCOMES (PO):

- PO-1: Develop statistical understanding using R software.
- PO-2: Gain proficiency in R programming
- PO-3: Perform statistical analysis and visualization
- PO-4: Interpret and communicate results
- PO-5: Apply R-based computational skills

PROGRAMME SPECIFIC OUTCOMES (PSO):

- PSO-1: Use R for Statistical Calculations
- PSO-2 Handle and Organize Data in R
- PSO-3: Create Graphs Using R.
- PSO-4: Write Simple and advanced R Programs.
- PSO-5: Apply R Skills to Real Problems

COURSE OUTCOMES (CO):

- CO-1: Students learn how to use R software for entering data, cleaning data, and doing basic operations.
- CO-2: Students can calculate important statistical measures and perform tests in R.
- CO-3: Students can create different graphs in R
- CO-4: Students can write small R scripts and use them to solve real-life data problems and present results clearly.



Name of the course: Certificate Course in Computation of Statistics using R-Software

Eligibility: Graduate

Duration: 48 Hours (02 Credits)

Medium: English

Admission Criterion: First cum First Serve

Lecture / Practical Timing: 15-16 days in September to October
(3 Hrs. daily = 1 Hr. Theory + 2 Hr. Practical)

Assessment: At the end of the course, examination will be conducted and certificates are issued to the participants who qualify the passing criterion.

Examination Pattern: Theory (MCQ): 50 Marks (Internal)

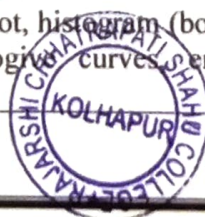
Syllabus

Total Credits	02
Total Hours	48
Theory	16
Practical	32

Detailed Syllabus

THEORY SYLLABUS: (16 Hrs.)

Sr. No.	Name of the Topic	Theory Periods (16)
1	Fundamentals of R: 1.1 Introduction to R, features of R, Installation of R, starting and ending R session getting help in R, R commands and case sensitivity. 1.2 Data types: Logical, numeric and complex 1.3 Vectors and vector arithmetic a) Creation of vectors using function C, assign, seq, rep b) Arithmetic operation on vectors using operators+, -, *, /, ^ c) Numerical functions: log10, log, sort, max, min, unique, range, length, var, prod, sum, summary, fivenum etc. d) Accessing vectors. e) Alternative ways to create vector by scan function. 1.4 Data frame: creation using data frame, subset and transform commands 1.5 Resident data sets: Accession and summary 1.6 Graphics using R: a) High level plotting functions b) Low level plotting functions c) Interactive graphic functions 1.7 Using R as calculator The following Statistical Methods using "R"	04
2	2.1. Sampling Methods: Drawing sample from a population using SRSWR, SRSWOR, Stratified random sampling, Systematic sampling. 2.2. Diagrams: Simple bar diagram, subdivided bar diagram, multiple bar diagram, Pie diagram, steam and leaf chart. 2.3. Graphs: Box plot, rod or spike plot, histogram (both equal and unequal class intervals), frequency polygon, ogive curves, empirical distribution function.	03



3	3.1. Measures of central Tendency: Computation of following measures for all types of data. Mean, mode, median, quartiles, Deciles, Percentiles, Geometric mean, Harmonic mean. 3.2. Measures of dispersion: computation of following measures for all types of data. Range, Quartile Deviation, Variance, Standard Deviation, Coefficient of Variation, Mean Deviation, Mean Squared Deviation. 3.3. Measures of Skewness and Kurtosis: Bowleys coefficient and Karl Pearson's coefficient of Skewness. 3.4. Moments: Computation of Raw and central moments, measures of Skewness and kurtosis	03
4	4.1. Probability Distribution: Simulation of random experiment, Hyper geometric distribution, computation of probabilities, model sampling, Fitting of Binomial, Poisson, Normal and Lognormal distribution: computational of probabilities, model sampling from log- normal, Weibull, Logistic distribution 4.2. Correlation and Regression: Fitting of lines of regression, computation of correlation coefficient, fitting of second curve. 4.3. Multiple Regression: Fitting of regression plane for trivariate data 4.4. Testing of Hypothesis: Large sample test for mean and proportions, t-test, variance test, Chi-square test, Computation of probabilities of type I and type II errors and power of the test 4.5. Analysis of Variance: One way, two way, Analysis of completely randomized Design (CRD), Analysis of randomized block design (RBD) 4.6. Data Mining: k-nearest neighbor techniques for classification, k-means techniques for clustering. 4.7. Statistical Quality Control: CUSUM chart, Exponentially weighted moving average charts (EWMA-chart)	06

PRACTICAL SYLLABUS: (32 Hrs.)

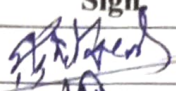
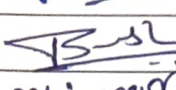
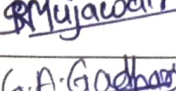
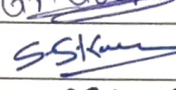
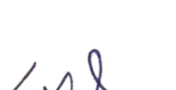
Sr. No.	Aim of the Practical	Practical Periods (32)
1	Data Input/Output, Diagrammatic And Graphical Representation Of Data Using R-Software.	3
2	Diagrammatic Representation	2
3	Graphical Representation Of Data Using R-Software	3
4	Model Sampling From Log-Normal And Weibull Distribution	3
5	Model Sampling From Logistic Distribution	3
6	Fitting Of Binomial And Poisson Distributions	3
7	Fitting Of Normal Distribution Using R-Software	3
8	Fitting Of Log-Normal Distribution	3
9	Analysis Of Completely Randomized Design (CRD) Using R-Software.	3
10	Analysis Of Randomized Block Design (RBD) Using R-Software.	3
11	Computation Of Probabilities Of Type I And Type II Errors And Power Of A Test Using R-Software.	3

REFERENCE BOOKS:

- Gardener, M. (2012). Beginning R: the statistical programming language. John Wiley & Sons.
- Purohit, S. G., Gore, S. D., & Deshmukh, S. R. (2015). Statistics using R. Alpha Science International.
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