

"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 Open Source Software
Self - Funded under Short Term Courses in the academic year 2024-25

COURSE REPORT

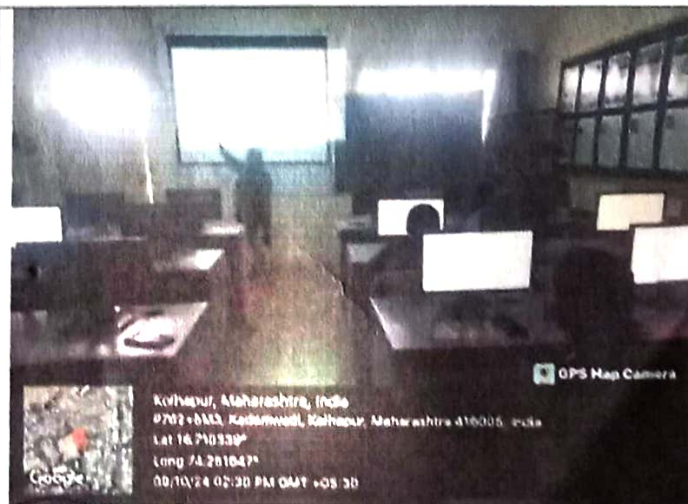
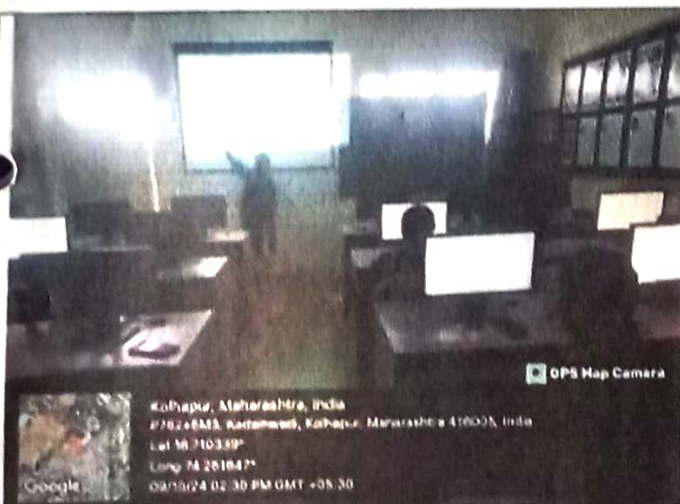
Department of statistics organized the certificate course on computation of statistics using open source software for M. Sc. I students for the academic year 2024-25. The main objectives of this course are:

- 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

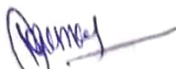
For this course fee of Rs.500 charged to the students. The course was conducted in the period of 01/10/2024 to 21/10/2024. Total number of beneficiaries for this course is 16. After completion of this course student's knowledge was checked through various computation tasks through assignments. Each student who successfully completed this course was awarded by certificate. Mr. Chougule P. S.(co-ordinator). Smt. Vhatkar D.S. and Mr. Kamble S.S. 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

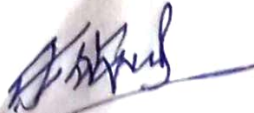
Total number of beneficiaries is 16.




Mr. P. S. Chougule
Head & Coordinator
Department of Statistics


Dr. M.K. Kannade
Incharge,
Short term Courses


Dr. U. S. Shelke
IQAC
Coordinator


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

"Education through self-help is our motto"- KARMAVEER

Rayat Shikshan Sanstha's

Rajarshi Chhatrapati Shahu College, Kolhapur

Department of Statistics

Organized

**Certificate Course on Computation of Statistics using Open Source
Software**

(Self – Funded)

Under

COC and Short Term Courses

2024-2025

Income and Expenditure Statement

Income	Amount (in Rs.)	Expenditure	Amount (in Rs.)
Particulars		Particulars	
1) Total Participants = 16 (16*500)	8000/-	1) GST 18%	1440/-
		2) Certificate Printing	260/-
		2) Remuneration for Recourse Person Lumsum (40% of Total amount 6300/- is 2520/- is equally distributed equally distributed into 4 persons)	
		ii) Smt. D.S. Vhatkar	1260/-
		iii) Mr. S.S.Kamble	1260/-
		3)Balance to College	3780/-
Total	8000=00	Total	8000=00


Mr. P. S. Chougule
Coordinator & Head,
Department of Statistics


Dr. M.K. Kannade
In charge,
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

CERTIFICATE

This is to certify that Prof./Shri/Shmt. Shipugade Shubham Sarjerao 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 open source software** organized by Department of Statistics
Rajarshi Chhatrapati Shahu College, Kolhapur from 01/10/2024 to 21/10/2024


Mr. P. S. Chougule
Coordinator & Head,
Dept. of Statistics


Dr. M. K. Kannade
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
Certificate Course on Computation of Statistics Using Open Source
Software
2024-25**

Enrollment List of Students

Roll No.	Name of Student	Fee
1	Borgave Prachi Suresh	500
2	Dabade Tejaswini Dattatray	500
3	Gaikwad Sanika Balaso	500
4	Gurav Vinayak Hidurao	500
5	Humbe Rutuja Ramchandra	500
6	Jadhav Vishwamohini Yuvraj	500
7	Kokitkar Samata Appa	500
8	Mujawar Sohel Isak	500
9	Patil Sanika Sanjay	500
10	Patil Vikram Sardar	500
11	Powar Rutuja Bhaskar	500
12	Powar Shweta Ashok	500
13	Shinde Manasi Govind	500
14	Shinde Swapnali Jaysingh	500
15	Shipugade Shubham Sarjerao	500
16	Tejam Shraddha Namdev	500
Total		8000


Head
Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur




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R.C. SHAHU COLLEGE
KOLHAPUR

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

Certificate Course Exam On Computation of Statistics using Open Source 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 ____
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 package in R is commonly used for data visualization?
a) `dplyr` b) `ggplot2` c) `data.table` d) `lubridate`
- 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) l
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	b) ggplot2
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()

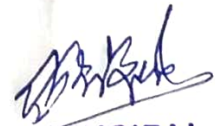


RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHTRPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS
Computation of Statistics using Open Source Software
2024-25
Result of Students

Roll No.	Name of Student	Class	Marks
1	Borgave Prachi Suresh	M.Sc. I	46
2	Dabade Tejaswini Dattatray	M.Sc. I	44
3	Gaikwad Sanika Balaso	M.Sc. I	48
4	Gurav Vinayak Hidurao	M.Sc. I	45
5	Humbe Rutuja Ramchandra	M.Sc. I	46
6	Jadhav Vishwamohini Yuvraj	M.Sc. I	45
7	Kokitkar Samata Appa	M.Sc. I	46
8	Mujawar Sohel Isak	M.Sc. I	46
9	Patil Sanika Sanjay	M.Sc. I	48
10	Patil Vikram Sardar	M.Sc. I	45
11	Powar Rutuja Bhaskar	M.Sc. I	46
12	Powar Shweta Ashok	M.Sc. I	44
13	Shinde Manasi Govind	M.Sc. I	46
14	Shinde Swapnali Jaysingh	M.Sc. I	48
15	Shipugade Shubham Sarjerao	M.Sc. I	48
16	Tejam Shraddha Namdev	M.Sc. I	48


Head
Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur




I/C PRINCIPAL
R.C. SHAHU COLLEGE
KOLHAPUR

RAYAT SHIKSHAN SANSTHA'
RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR

DEPARTMENT OF STATISTICS

“Computation of Statistics using Open Source Software”

M. Sc. I

ROLL NO.	NAME OF STUDENT	1/10/24	31/10/24	4/11/24	5/11/24	7/11/24	8/11/24	9/11/24	10/11/24
1	Borgave Prachi Suresh	PS Borgave	PS Borgave	PS Borgave	PS Borgave	PS Borgave	PS Borgave	PS Borgave	PS Borgave
2	Dabade Tejaswini Dattatray	Dabade	Dabade	Dabade	Dabade	Dabade	Dabade	Dabade	Dabade
3	Gaikwad Sanika Balaso	Gaikwad	Gaikwad	Gaikwad	Gaikwad	Gaikwad	Gaikwad	Gaikwad	Gaikwad
4	Gurav Vinayak Hidurao	Gurav	Gurav	Gurav	Gurav	Gurav	Gurav	Gurav	Gurav
5	Humbe Rutuja Ramchandra	Redage	Redage	Redage	Redage	Redage	Redage	Redage	Redage
6	Jadhav Vishwamohini Yuvraj	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav
7	Kokitkar Samata Appa	SATK	SATK	SATK	SATK	SATK	SATK	SATK	SATK
8	Mujawar Sohel Isak	f.	f.	f.	f.	f.	f.	f.	f.
9	Patil Sanika Sanjay	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
10	Patil Vikram Sardar	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
11	Powar Rutuja Bhaskar	Pas	Pas	Pas	Pas	Pas	Pas	Pas	Pas
12	Powar Shweta Ashok	Shweta	Shweta	Shweta	Shweta	Shweta	Shweta	Shweta	Shweta
13	Tejam Shraddha Namdev	Shigam	Shigam	Shigam	Shigam	Shigam	Shigam	Shigam	Shigam
14	Shinde Manasi Govind	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde
15	Shinde Swapnali Jaysingh	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde
16	Shipugade Shubham Sarjerao	Shipugade	Shipugade	Shipugade	Shipugade	Shipugade	Shipugade	Shipugade	Shipugade


Head

Department of Statistics
Rajarshi Chh. Shahu College, Kolhar




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KOLHAPUR

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

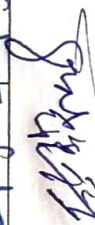
“Computation of Statistics using Open Source Software”

M. Sc. I

ROLL NO.	NAME OF STUDENT	11/10/24	14/10/24	15/10/24	16/10/24	17/10/24	18/10/24	19/10/24	21/10/24
1	Borgave Prachi Suresh	P.s. Borgave	P.s. Borgave	P.s. Borgave	P.s. Borgave	P.s. Borgave	P.s. Borgave	P.s. Borgave	P.s. Borgave
2	Dabade Tejaswini Dattatray	Dabade	Dabade	Dabade	Dabade	Dabade	Dabade	Dabade	Dabade
3	Gaikwad Sanika Balaso	Bastul	Bastul	Bastul	Bastul	Bastul	Bastul	Bastul	Bastul
4	Gurav Vinayak Hidurao	Purav	Purav	Purav	Purav	Purav	Purav	Purav	Purav
5	Humbe Rutuja Ramchandra	Pedoge	Pedoge	Pedoge	Pedoge	Pedoge	Pedoge	Pedoge	Pedoge
6	Jadhav Vishwamohini Yuvraj	Qum	Qum	Qum	Qum	Qum	Qum	Qum	Qum
7	Kokitkar Samata Appa	SAK	SAK	SAK	SAK	SAK	SAK	SAK	SAK
8	Mujawar Sohel Isak	f	f	f	f	f	f	f	f
9	Patil Sanika Sanjay	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
10	Patil Vikram Sardar	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
11	Powar Rutuja Bhaskar	Pat	Pat	Pat	Pat	Pat	Pat	Pat	Pat
12	Powar Shweta Ashok	Shweta	Shweta	Shweta	Shweta	Shweta	Shweta	Shweta	Shweta
13	Tejam Shraddha Namdev	Shigra	Shigra	Shigra	Shigra	Shigra	Shigra	Shigra	Shigra
14	Shinde Manasi Govind	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde
15	Shinde Swapnali Jaysingh	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde	Shinde
16	Shipugade Shubham Sarjerao	Shipugade	Shipugade	Shipugade	Shipugade	Shipugade	Shipugade	Shipugade	Shipugade


Head
Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur




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KOLHAPUR

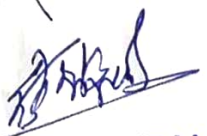
RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHTRPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS
Computation of Statistics using Open Source Software
2024-25

List of Students

Roll No.	Name of Student	Fee	Sign
1	Borgave Prachi Suresh	500	P.S. Borgave
2	Dabade Tejaswini Dattatray	500	Dabade
3	Gaikwad Sanika Balaso	500	Gaikwad
4	Gurav Vinayak Hidurao	500	Gurav
5	Humbe Rutuja Ramchandra	500	Humbe
6	Jadhav Vishwamohini Yuvraj	500	Jadhav
7	Kokitkar Samata Appa	500	Kokitkar
8	Mujawar Soheli Isak	500	Mujawar
9	Patil Sanika Sanjay	500	Patil
10	Patil Vikram Sardar	500	Patil
11	Powar Rutuja Bhaskar	500	Powar
12	Powar Shweta Ashok	500	Powar
13	Shinde Manasi Govind	500	Shinde
14	Shinde Swapnali Jaysingh	500	Shinde
15	Shipugade Shubham Sarjerao	500	Shipugade
16	Tejam Shraddha Namdev	500	Tejam


Head
 Department of Statistics
 Rajarshi Chh. Shahu College, Kolhapur




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 R.C. SHAHU COLLEGE
 KOLHAPUR

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

**Organized,
Computation of Statistics using Open Source Software**

On 01/11/2024 to 21/11/2024

2024-25

Enrollment List

Roll No.	Name of Student	Fee	Receipt No.	Sign
1	Borgave Prachi Suresh	500	6911	P.S. Borgave
2	Dabade Tejaswini Dattatray	500	6912	Dabade
3	Gaikwad Sanika Balaso	500	6913	Gaikwad
4	Gurav Vinayak Hidurao	500	6914	Gurav
5	Humbe Rutuja Ramchandra	500	6915	R. Jedge
6	Jadhav Vishwamohini Yuvraj	500	6916	Jadhav
7	Kokitkar Samata Appa	500	6917	Kokitkar
8	Mujawar Soheli Isak	500	6918	Mujawar
9	Patil Sanika Sanjay	500	6919	Patil
10	Patil Vikram Sardar	500	6920	Patil
11	Powar Rutuja Bhaskar	500	6921	Powar
12	Powar Shweta Ashok	500	6922	Powar
13	Shinde Manasi Govind	500	6923	Shinde
14	Shinde Swapnali Jaysingh	500	6924	Shinde
15	Shipugade Shubham Sarjerao	500	6925	Shipugade
16	Tejam Shraddha Namdev	500	6926	Tejam
Total		8000		

Head

Department of Statistics
Rajarshi Chh. Shahu College, Kolhar



**H/C PRINCIPAL
R.C. SHAHU COLLEGE
KOLHAPUR**

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

Organized

Computation of Statistics using Open Source Software

(Self - Funded Under COC)

Time Table 2024-25

	Venue	Date		01/10/24	03/10/24	04/10/24	05/10/24	07/10/24	08/10/24	09/10/24	10/10/24
		Time									
Theory & Practical	Lab 1 (Stat.Lab)	11:00-12:00 & 12:00-02:00	DSV	SSK	DSV	SSK	SSK	DSV	SSK	DSV	SSK

	Venue	Date		11/10/24	14/10/24	15/10/24	16/10/24	17/10/24	18/10/24	19/10/24	21/10/24
		Time									
Theory & Practical	Lab 1 (Stat.Lab)	11:00-12:00 & 12:00-02:00	DSV	SSK	DSV	SSK	SSK	DSV	SSK	DSV	SSK

Sr. No.	Name of Lecturer	
1	DSV	Smt. Vhatkar D. S.
2	SSK	Mr. Kamble S. S.



Head
Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur

VC PRINCIPAL
R.C. SHAHU COLLEGE
KOLHAPUR

**RAYAT SHIKSHAN SANSTHA'S
RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR
DEPARTMENT OF STATISTICS
M.Sc. I (2024-25)**

NOTICE

All students of M.Sc. I hereby informed that, your **“Computation of Statistics using Open Source Software”** organized by Department of Statistics, will be start from 01/10/2024. 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.




Head
Department of Statistics
Rajarshi Chh. Shahu College, Kolhapur

रयत शिक्षण संस्थचे
राजर्षी छत्रपती शाहू कॉलेज, कोल्हापूर
शॉर्ट टर्म/सीओसी कोर्सेस फी आणि त्याच्या खर्चाबाबतचा ठराव

प्रस्ताव : महाविद्यालयातील विद्यार्थिनींनी पारंपरिक शिक्षणाबरोबरच विविध कौशल्ये आत्मसात करून त्यांनी आत्मनिर्भर व्हावे यासाठी महाविद्यालयात एकूण 22 शॉर्ट टर्म कोर्स व ३ सी. ओ. सी. कोर्स राबविले जात आहेत. या शॉर्ट टर्म व सी. ओ. सी. कोर्सेस साठी महाविद्यालयातील विद्यार्थी प्रवेशित होत असतात. या कोर्स साठी रु. ५००/- 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.

तांत्रिक माहिती: महाविद्यालयात कला, वाणिज्य, विज्ञान, बी.एस्सी.कॉम्प्युटर सायन्स, बी.एस्सी.कॉम्प्युटर सायन्स (इन्टायर) तसेच एम.ए. इंग्लीश, एम.कॉम.(आएटी), एम. एस्सी.केमिस्ट्री, एम. एस्सी. संख्याशास्त्र इ. विद्याशाखांमध्ये महाविद्यालयाचे शैक्षणिक कामकाज सुरू आहे. चालू वर्षात महाविद्यालयात एकूण १२३२ विद्यार्थिनींनी 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	Fee
1	Biodiversity Conservation	500/-
2	Understanding of Basic Electronics Devices	500/-
3	Secretarial Training	500/-
4	Preparation of Household Chemical	500/-
5	Mudritshoduan koushalya (मुद्रितशोधन)	500/-
6	Application of MS.Excel in Statistics	500/-
7	Advanced Excel	500/-
8	Computation of statistics using R-Software	500/-
9	Exploratory Data Analysis Using MS- Excel	500/-
10	Computation of Statistics using open source software	500/-
11	Entrepreneurs Development	500/-
12	Retail Marketing	500/-
13	Yoga & meditation	500/-
14	Introducing Forts in Maharashtra	500/-
15	Event Management	500/-
16	Foundry Technology	500/-
17	Anuvad Siddhant Aur Prayog (अनुवाद सिद्धांत और प्रयोग),	500/-
18	Certificate course in Vermitechnology	500/-
19	Fashion Designing	500/-
20	Beauty Parlour	1,000/-
21	Flower Arrangement and Ikebana	500/-
22	A short term course in English communication skills of vidya probodhini	500/-



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

आर्थिक तरतूद : महाविद्यालयामध्ये प्रवेश घेतलेल्या विद्यार्थ्यांपैकी जे विद्यार्थी सदर कोर्सेस साठीही प्रवेश घेतात त्या विद्यार्थ्यांकडून प्रति विद्यार्थी प्रति कोर्स साठी रुपये ५००/- 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 विद्यार्थिनींच्याबरोबरच 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

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

ठराव: महाविद्यालयाच्या सर्व विभागप्रमुखांची मिटींग मा. प्राचार्य उपस्थितीत दिनांक १३/०७/२०२४ रोजी पार पडली. सदर मिटींगमध्ये चर्चा करून सर्वानुमते महाविद्यालयामध्ये सुरू असलेले शॉर्ट टर्म व सी. ओ. सी. कोर्सेस हे विद्यार्थिनींच्याबरोबरच महाविद्यालयाच्या विकासासाठी उपयुक्त आहेत. त्यामुळे सदर शॉर्ट टर्म कोर्सेसमधून विद्यार्थिनींच्या कौशल्याबरोबरच महाविद्यालयास चांगल्या प्रकारचे उत्पन्न प्राप्त होत असते. त्यामुळे सदर कोर्सेस चालू करावेत व प्रति कोर्सेसकरिता रुपये ५०० 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 बाबीवर खर्च करावी व उर्वरित उर्वरित ६०% रक्कम महाविद्यालयात जमा करावी. असे सर्वानुमते ठरले. सदर मिटींग करिता खालील विभाग प्रमुख उपस्थितीत होते

करण्यास महाविद्यालय विकास समितीची मान्यता देण्यात येत आहे.

सूचक: डॉ. लवेकर एस. एस.

अनुमोदक: डॉ. पाटील आर. सी.

ठराव सर्वानुमते मंजूर

सदर मिटींग करिता खालील विभाग प्रमुख उपस्थितीत होते

- 1) डॉ. पुंणताबेकर बी. एस. - B.S.P. L
- 2) डॉ. कन्नाडे एम. के. - Kanna
- 3) डॉ. कदम एम. डी. - Kadam
- 4) डॉ. खोले एस. सी. - Khole
- 5) डॉ. लंगारे जी. एम. - Langare
- 6) डॉ. फरास एस. ए. - Faras
- 7) डॉ. लवेकर एस. एस. - Lavekar
- 8) डॉ. पाटील आर. सी. - Patil
- 9) डॉ. पाटील ए. आर. - Patil
- 10) डॉ. पीस्ते पी. बी. - Piste
- 11) डॉ. शेख एस. डी. - Sheikh
- 12) श्री. शेडगे एस. डी. - Shedge
- 13) श्री. चौगुले पी. एस. - Chougale
- 14) श्रीमती शेख झेड. जे. - Sheikh
- 15) श्रीमती मालवेकर डी. ए. - Malvekar



राजर्षी छत्रपती शाहू कॉलेज, कोल्हापूर

प्राचार्य,
राजर्षी छ. शाहू कॉलेज,
कोल्हापूर.

**“Education through self-help is our motto”-Karmveer
Rayat Shikshan Sanstha's
Rajarshi Chhatrapati Shahu College, Kolhapur
Department of Statistics
Information regarding Skill Development Courses/Career Oriented Courses**

Name of the Department: Department of Statistics

Course name: Computation of Statistics Using Open-Source Software (R)

Course Coordinator name & Contact number: Mr. P. S. Chougule (9822680411, 7083633933)

Implementation Year: 2022

Duration: 16 days

Course Fee: Rs. 500/-

Eligibility: It is suitable for post graduate and researchers from any field that uses statistical computing.

Minimum intake Capacity: 20

Objectives of the Course:

This course aims to provide a practical introduction to the R programming language.

- In this course you will learn how to program in R and how to use R for effective data analysis.
- This course covers practical issues in statistical computing which includes programming in R, reading data into R, accessing R packages, writing R functions,
- R code for in statistical data analysis will provide working examples and running summary statistics and visualizations and simulations form various distributions

Learning Outcomes : By the end of the course students you shall be confident and equipped with all the knowledge required to perform analytical activities in R. Specifically,

- A new way of thinking
- Download and Install R
- A new language for speaking and reading (vectors, data frames, functions, objects, etc.

- A new syntax for writing, e.g. `c()`, `print()`, `cat()`, `sort()`, `require()`, `subset()` for data analysis and presentation .
- Understand the concepts of objects and assignment
- Construct tables and figures
- Load a script file, run lines from it, edit and save the script file.
- Load a Workspace containing an R dataframe, edit the dataset, and save the Workspace.
- Variable types in R
- Understand the different data types in R
- Understand the different data structures in R
- Understanding Assignment operations
- create loops to solve different types of problems
- Use R for descriptive statistics
- Simulation, code profiling
- Perform appropriate statistical tests using R
- Expand R by installing R packages
- Create their own customized function
- Online R Learning resources

Syllabus:

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"

2. Sampling Methods: Drawing sample from a population using SRSWR, SRSWOR, Stratified random sampling, Systematic sampling.
3. Diagrams: Simple bar diagram, subdivided bar diagram, multiple bar diagram, Pie diagram, stem and leaf chart.
4. Graphs: Box plot, rod or spike plot, histogram (both equal and unequal class intervals), frequency polygon, ogive curves, empirical distribution function.
5. Measures of central Tendency: Computation of following measures for all types of data. Mean, mode, median, quartiles, Deciles, Percentiles, Geometric mean, Harmonic mean.
6. 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.
7. Measures of Skewness and Kurtosis: Bowleys coefficient and Karl Pearson's coefficient of Skewness.
8. Moments: Computation of Raw and central moments, measures of Skewness and kurtosis
9. 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
10. Correlation and Regression: Fitting of lines of regression, computation of correlation coefficient, fitting of second curve.
11. Multiple Regression: Fitting of regression plane for trivariate data
12. 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
13. Analysis of Variance: One way, two way, Analysis of completely randomized Design (CRD), Analysis of randomized block design (RBD)
14. Data Mining: k-nearest neighbor techniques for classification, k-means techniques for clustering.
15. Statistical Quality Control: CUSUM chart, Exponentially weighted moving average charts (EWMA-chart)