Report

On

Add-on Course on

SAGE MATH AND ITS APPLICATIONS

Conducted by

Department of Mathematics

Raja Peary Mohan College, Uttarpara, Hooghly

2022-2023



RAJA PEARY MOHAN COLLEGE

1, Acharya Dhruba Pal Road, Uttarpara, Hooghly, West Bengal, Pin-712 258. Tel No.: (033)2663-0191, Mob: 7074292263 Website: https://www.website.rpmcollege.edu.in/, e-mail: rajapearymohancollege@gmail.com

ISO Certified

Ref.:	Date:

DECLARATION FROM THE PRINCIPAL

This is to certify that all the data provided in this document is true to the best of my knowledge.

SAGEMATH AND ITS APPLICATIONS

ADD ON COURSE BY

DEPARTMENT OF MATHEMATICS

SESSION: 2022 - 2023

Course Director : Dr. Sudip Kumar Chakrabarty

Course Coordinator : Dr. Tanusree Choudhury

Course Duration : 36 Hours

Mode of Teaching : OFFLINE

Beneficiary: Mathematics Honours Students

(Final Semester)

Course Objective: This course aims to use SageMath, a free and open source computer system to explore concepts in Calculus, Applied Linear Algebra and Numerical Methods. The course will begin with the introduction of basic SageMath, plotting 2D and 3D objects. The main focus will be on using SageMath to explore topics in Calculus, Applied Linear Algebra, Numerical Methods and several applications.

Mode Of delivery: Lectures & Hands on (in the Lab)

Syllabus (Outline):

1. Introduction to SageMath

2. Numerical and symbolic computations using mathematical functions

3. Graphical representations of few functions

4. Plots of functions with asymptotes

5. Superimposing multiple graphs in one plot like plotting a curve along with a

tangent on that curve (if it exists)

6. SageMath commands for differentiation, higher order derivatives

7. Introduction to Programming in SageMath

8. Use of inbuilt functions that deal with matrices, determinant, inverse of a

given real square matrix (if it exists), solving a system of linear equations,

finding roots of a given polynomial

9. Solving differential equations

Course fee: Rs. 250/-

Number of seats: 25

Contact for information and registration:

courses.maths.rpmc@gmail.com

RAJA PEARY MOHAN COLLEGE



1, ACHARYA DHRUBA PAL ROAD, UTTARPARA, HOOGHLY, WEST BENGAL, PIN - 712 258 Tel No.: 033-2663-0191 & 7074292263

E-mail : rajapearymohancollege@gmail.com Website : www.rpmcollege.edu.in ১, আচার্য্য ধ্রুব পাল রোড উত্তরপাড়া, হুগলী, পশ্চিমবঙ্গ, পিন - ৭১২২৫৮,

> দূরভাষ ঃ ০৩৩-২৬৬৩-০১৯১ & ৭০৭৪২৯২২৬৩ NAAC Accreditated with B grade (2.7); *ISO 9001 : 2015*

Ref. No. /সূচক সংখ্যা

Date / তারিখ 0 4.03.23

Extract of the Proceedings of the meeting of the IQAC of Raja Peary Mohan College, Uttrapra, Hooghly, held on 27.02.2023 in the IQAC Room.

Agendum No 4:

Resolved that the following Addon/Certificate courses will start from 2022-2023 even semester.

New courses to be introduced

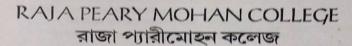
- 1. Political Science: Climate Change & Public Policy Indian Perspectives.
- 2. Physics: basic computational tools for scientific applications.
- 3. Research: Basic Practical Bio technology.
- 4. Mitali Women Cell: Handicrafts & Jewllery Making.
- 5. Philosophy: Philosophy & Practice: Some ethical issues in Contemporary era.
- 6. Central Library: Digital Library
- 7. Economics: Add on Course on Advances in Applied Econometrics with Stata Software
- 8. Bengali: Certificate Course on Folklore
- 9. Photography Club: Add on Course on Photography & Photo Editing for Beginners
- 10. Heritage Cell: Add on course on Painting & its Applications
- 11. Bengali: Add on Course on Eco-Fiction
- 12. Computer Science: Add on Course on Advance course on MS Office & Networking
- 13 Add on course on Book Making & Editing
- 14. Mathematics: Add on Course on Sage Maths and its Applications
- 15, Add on Course in Digital Marketing.

Sarjucte Bhattachente

Coordinator, IQAC Raja Peary Mohan College Uttarpara, Hooghly

Coordinator, Internal Quality Assurance Cell Raja Peary Mohan College Uttarpara, Hooghly Principal Antonia

Raja Peary Mohan College Uttarpara, Hooghly





, ACHARYA DHRUBA PAL ROAD, UTTARPARA, HOOGHLY, WEST BENGAL, PIN - 712 258 Tel No. : 033-2663-0881/2663-0191, Fax No. : 033-2663-4155 E-mail : rajapearymohancollege@gmail.com Website : www.rpmcollege.org.in ১, আচাৰ্য্য ধ্ৰুৰ পাল রোড উদ্ধ্যপাড়া, তুগলী, পশ্চিমবল, পিন - ৭১২২২৮,

দ্রস্থায় ঃ ০৩৩-২৬৬৩-০৮৮১/২৬৬৩-০১৯১, ফ্যাক্স ঃ ০৩৩-২৬৬৩-৪১৫৫

Ref. No. /সূচক সংখ্যা _

Date / Sifis 23,03.23

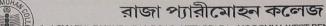
NOTICE

It is hereby notified for all concerned that the Add on Course conducted by Department of Mathematics on "Sage Math and its Applications" will commence from 8th April, 2023. Interested students may enroll their name to the course coordinator.

Janussee Choudhury Course Coordinator

Principal

RAJA PEARY MOHAN COLLEGE



1, ACHARYA DHRUBA PAL ROAD, UTTARPARA, HOOGHLY, WEST BENGAL, PIN - 712 258
Tel No.: 033-2663-0881/2663-0191, Fax No.: 033-2663-4155
E-mail: rajapearymohancollege@gmail.com Website: www.rpmcollege.org.in
১, আচার্য্য শুন্ত পাল রোভ উত্তরপাড়া, ভুগলী, পশ্চিমবঙ্গ, পিন - ৭১২২৫৮,
দূরভাব ঃ ০৩৩-২৬৬৩-০৮৮১/২৬৬৩-০১৯১, ফ্যাঙ্গ ঃ ০৩৩-২৬৬৩-৪১৫৫

NOTICE

It is hereby notified for all concerned that the classes of the Add on Course conducted by Department of Mathematics on "SAGEMATH AND ITS APPLICATIONS" will commence from 8th April, 2023.

Course Coordinator

Principal

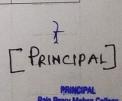
PRINCIPAL Raja Peary Mohan College Uttarpara, Hooghly

the mast

Sage Math and Its Applications ADD ON COURSE 2023 Department of Mathematics Registration of the Course

S.N.	Student Id	Name	Roll No	Signature
1.	BSe./20/0017	Ankan Manna	017	Manna
2.	BSe. 20 0244	Ankita Rajbhar	244	Ankita Rajbhar.
3.	BS. 120 0237	Anwesha Manna	237	Ancuesha Manna
4.	BSe 20 0087	Arghya Santra	087	Santra
5.	B& 20 0205	Ayantika Karmakar	205	Ayantika warmakar.
6.	BSe. 120 0014	Dibyashri Chowdhury	014	Chowdlury.
7.	BSe. 20 0189	Indranil Ganguly	189	Indian'l Gangaly
8.	BSE 120 0015	Jeet Kumar Nayek	015	Jeet Kumar Nayek
9.	BSe. 20 0240	Kaustav Chattopadhyay	240	Charto packy
10.	BSc /20/0239	Rohit Gupta	239	RobitGrapha
11.	B&/20/0067	Shubhankar Dalui	067	Shubhankour Dalui
12.	BSe. 120/0156	Siya Sana	156	SiyaSara
13.	BSe 20 0264	Srinita Sen	264	Socionita Sen
14.	BSc 20 0073	Tamirul Islam	073	Tamirul
15.	B&, 20 0188	Triyasa Ghosh	188	Triyasa Ghosh
7				110
116				

Janusree Choudhury [Course Coordinator]



Department of Mathematics Attendance Sheet Class Duration - 1 Hour

Student Id	Name	Date 08.04	Date 10.64	Date 11.04	Date 18.04	Date 19.04	24.64 24.64
BSc/20/017	ANKAN MANNA	P	P	P	P		P
BSc/20/244	ANKITA RAJBHAR	P		P	P	P	P
BSc/20/237	ANWESHA MANNA	P	P	P	P	P	P
BSc/20/087	ARGHYA SANTRA	P	P	P	P	P	P
BSc/20/205	AYANTIKA KARMAKAR		P	P	P	P	ρ
BSc/20/014	DIBYASHRI CHOWDHURY	P	P	•		ρ	P
BSc/20/189	INDRANIL GANGULY	P	P	P	P	P	•
BSc/20/015	JEET KUMAR NAYEK	P	P	P	•	P	P
BSc/20/240	KAUSTAV CHATTOPADHYAY	P	•	P	P	P	P
BSc/20/239	ROHIT GUPTA	P	P	P	P	P	,
BSc/20/067	SUBHANKAR DALUI	P	•	P	,	P	P
BSc/20/156	SIYA SANA	P	P	,	ρ	P	P
BSc/20/264	SRINITA SEN	P	P	P	P	P	
BSc/20/073	TAMIRUL ISLAM	P	P		P	•	₽
BSc/20/188	TRIYASA GHOSH	P	P	P	,	ρ	ρ

Janusne Choudhury [Course Coordinator]

[Principal]

Department of Mathematics Attendance Sheet Class Duration - 1 Hour

Student Id	Name	Date 24 obj	26.04	26.04	Date 02.05	Date 03.65	03.05
BSe/20/017	ANKAN MANNA	P	P	,	P	P	P
BSc/20/244	ANKITA RAJBHAR	P	,	P	P	P	P
BSe/20/237	ANWESHA MANNA	P	P	P	•	P	P
BSc/20/087	ARGHYA SANTRA	P	P	P	P	P	
BSe/20/205	AYANTIKA KARMAKAR	P	P	P	P	•	P
BSc/20/014	DIBYASHRI CHOWDHURY	P	P		P	P	P
BSc/20/189	INDRANIL GANGULY		P	P	P	P	P
BSe/20/015	JEET KUMAR NAYEK	P	,	P	ρ	P	P
BSc/20/240	KAUSTAV CHATTOPADHYAY	P	P	P		P	P
BSc/20/239	ROHIT GUPTA	P	P	P	P	•	P
BSc/20/067	SUBHANKAR DALUI	P	P	P	P	P	
BSe/20/156	SIYA SANA		P	P	P	P	P
BSc/20/264	SRINITA SEN	P	,	P	P	P	P
BSc/20/073	TAMIRUL ISLAM	P	P	P	P	•	P
BSc/20/188	TRIYASA GHOSH	P	P	P	P	P	

Janusze Choudhury [Course Coordinator] · 🙀 [Principal]

Department of Mathematics Attendance Sheet Class Duration - 1 Hour

Student Id	Name	08.05	Date 08.05	11.05 11.05	Date 11.05	Date 15,05	18.05
BSc/20/017	ANKAN MANNA	P	7	P	P	P	P
BSc/20/244	ANKITA RAJBITAR		P	P	P	P	
BSc/20/237	ANWESHA MANNA	P	P	,	P	P	P
BSc/20/087	ARGHYA SANTRA	P	P	P	•	P	P
BSc/20/205	AYANTIKA KARMAKAR	P	P	P	P	,	P
BSc/20/014	DIBYASHRI CHOWDHURY		P	P	,	P	P
BSc/20/189	INDRANIL GANGULY	P		P	P	P	P
BSc/20/015	JEET KUMAR NAYEK	P	P	P	P	P	•
BSc/20/240	KAUSTAV CHATTOPADHYAY	P	P		P	P	P
BSc/20/239	ROHIT GUPTA	P	P	P	P	•	P
BSc/20/067	SUBHANKAR DALUI	P	P	P	P	P	•
BSc/20/156	SIYA SANA	P	•	P	,	P	P
BSc/20/264	SRINITA SEN	•	P	P	P	P	P
BSc/20/073	TAMIRUL ISLAM	P	P	P	P	,	P
BSc/20/188	TRIYASA GHOSH	P	P	P	,	P	

Janassee Choudhury

[Principal]

Department of Mathematics Attendance Sheet Class Duration - 1 Hour

Student Id	Name	Date 18.05	28.05 5.4	Date 20.05	22.05 22.05	Date 22.05	25.0
BSc/20/017	ANKAN MANNA	P	P		P		P
BSc/20/244	ANKITA RAJBHAR		P	P	P	P	P
BSc/20/237	ANWESHA MANNA	P		P	P	P	P
BSc/20/087	ARGHYA SANTRA	P	P	P		P	•
BSc/20/205	AYANTIKA KARMAKAR		P	P	P	ρ	P
BSc/20/014	DIBYASHRI CHOWDHURY	P		P	Ρ	P	P
BSc/20/189	INDRANIL GANGULY	P	P	,	ρ	P	P
BSc/20/015	JEET KUMAR NAYEK	P	P	P	P	P	P
BSc/20/240	KAUSTAV CHATTOPADHYAY	P	P	P	•	P	P
BSc/20/239	ROHIT GUPTA	P	P	P	P	•	٩
BSc/20/067	SUBHANKAR DALUI	P	P	P	P	P	
BSc/20/156	SIYA SANA	P	ρ	P	P	P	P
BSc/20/264	SRINITA SEN	P	P	P	P	P	P
BSc/20/073	TAMIRUL ISLAM	P		P	P	P	P
BSc/20/188	TRIYASA GHOSH	þ	P	P	•	P	,

Janustee Choudhury [Course Coordinator]

? [Principal]

Department of Mathematics Attendance Sheet Class Duration - 1 Hour

Student Id	Name	Date 27.05	Date 27.05	Date 29.05	Date 29AS	Date 020b	02.06 2.H
BSc/20/017	ANKAN MANNA	P	P	P	P	P	P
BSc/20/244	ANKITA RAJBHAR	P	P		ρ	P	P
BSc/20/237	ANWESHA MANNA	P	•	P	P	P	P
BSc/20/087	ARGHYA SANTRA		P	P	P	P	P
BSc/20/205	AYANTIKA KARMAKAR	P	P	P	P	P	P
BSc/20/014	DIBYASHRI CHOWDHURY	P	P	P	•	,	P
BSc/20/189	INDRANIL GANGULY	P	P	P	P	P	•
BSc/20/015	JEET KUMAR NAYEK	•	P	f	P	P	P
BSc/20/240	KAUSTAV CHATTOPADHYAY	P	,	P	P	P	P
BSc/20/239	ROHIT GUPTA	P	P	1	P	P	P
BSc/20/067	SUBHANKAR DALUI	P	P	P	•	P	P
BSc/20/156	SIYA SANA	P	P	P	P	•	p
BSc/20/264	SRINITA SEN	P	P	P	P	P	•
BSc/20/073	TAMIRUL ISLAM		P	P	P	P	P
BSc/20/188	TRIYASA GHOSH	P	•	P		P	P

Janusree Choudhury
[Course Coordinator]

[Principal]

Department of Mathematics Attendance Sheet Class Duration - 1 Hour

Student 1d	Name	Date 05.06	05.06	Date 07.66	Date 01.06	Date OS. A.b.	Date 10.06
BSc/20/017	ANKAN MANNA	P	•	P	P	P	P
BSc/20/244	ANKITA RAJBHAR	P	ρ	P	,	P	P
BSe/20/237	ANWESHA MANNA	P	P		P	P	P
BSc/20/087	ARGHYA SANTRA	•	P	P	P	P	P
BSc/20/205	AYANTIKA KARMAKAR	P	P	P	P		P
BSc/20/014	DIBYASHRI CHOWDHURY	P	P	P	P	P	P
BSc/20/189	INDRANIL GANGULY	P		P	P	•	P
BSe/20/015	JEET KUMAR NAYEK	P	P	P	P	P	P
BSc/20/240	KAUSTAV CHATTOPADHYAY	,	P	P	P	P	P
BSc/20/239	ROHIT GUPTA	P	P	•	P	P	P
BSc/20/067	SUBHANKAR DALUI	P	P	P		P	P
BSc/20/156	SIYA SANA	P	P	P	P	P	P
BSc/20/264	SRINITA SEN	•	P	P	P	P	P
BSc/20/073	TAMIRUL ISLAM	P		P	P	P	P
BSc/20/188	TRIYASA GHOSH	P	P	P	P	P	P

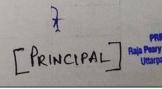
Janueree Choudhury [Course Coordinator]

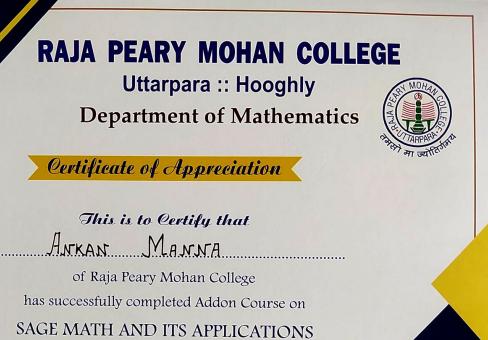
Principal]

Sage Math and Its Applications ADD ON COURSE 2023 Department of Mathematics Distribution of Certificates

S.N.	Student Id	Name	Roll No	Signature
1.	B& 20 00 17	Ankan Manna	017	Ankan
2.	BSe. 20 0244	Ankita Rajbhar	244	Ankite Rajbhar.
3.	BSc. 20 0237	Anwesha Manna	237	Ancvesha Manna
4.	B& 20/0087	Arghya Santra	087	Santra
5.	BSe. 20/0205	Ayantika Karmakar	205	Ayantika
6.	B&. 20/0014	Dibyashri Chowdhury	014	Dileyashen Chowdlury
7.	B&. 20/0189	Indranil Ganguly	189	Indrani 1 Ganguly
8.	B& 20 0015	Jeet Kumar Nayek	015	Jeet Kumar Nayek
9.	B&. 20/0240	Kaustav Chattopadhyay	240	Chutto Beddy
10.	B&. 20 0239	Rohit Gupta	239	Robert
11.	BSe. 20 0067	Shubhankar Dalui	067	Shubhamkour Doublie
12.	B&. 20/0156	Siya Sana	156	SiyaSan
13.	B&. 20 0264	Srinita Sen	264	Socinita Ser
14.	BS. 20 0073	Tamirul Islam	073	Tamirul
15.	B& 20/0188	Triyasa Ghosh	188	Trojyasa
10				
1				

Januaree Choudhuny
[COURSE COORDINATOR]





13135

Raja Peary Mohan College

with a score of90 (out of 100)

Lanusree Choudhury Course Coordinator

Date: 21.06.23

SAGEMATH AND ITS APPLICATIONS

ADD ON COURSE 2023

Department of Mathematics

A Brief Report of The Course

We want to create adequate opportunities for our students to acquire the additional skills within our campus by saving their time, money and energy. Realizing this urgency of enhancing the skill and as SageMath can be used in various fields of Mathematics like basic algebra, graph theory and numerical computations, Department of Mathematics of Raja Peary Mohan College organized an Add On course "SageMath and Its Applications". This course was offered to all Mathematics Honours students of final semester. The course was of thirty six hours duration (from 8thApril, 2023—10th June, 2023) and delivered in offline mode (theory lectures and hands on training in the departmental lab). After completion of the course certificates were distributed among successful candidates.

SOME PICTURES OF THE COURSE





Department of Mathematics

LECTURE AND LAB SCHEDULE

TOPIC	SPEAKER/TRAINER	NO. OF LECTURES/
		HANDS ON SESSION
		(IN HOURS)
Introduction to SageMath, Installation Procedure	T Choudhury	01
Lab Session	T Choudhury	01
Numerical and symbolic computations using mathematical functions	T Choudhury	02
Lab Session	D Mandal	02
Graphical representations of few functions	T Choudhury	02
Lab Session	T Choudhury	02
Plots of functions with asymptotes	S Roy	01
Lab Session	S Roy	01
Superimposing multiple graphs in one plot	T Choudhury	02
Lab Session	S Banerjee	02
SageMath commands for differentiation, higher order derivatives	D Mandal	02
Lab Session	S Roy	02
Indefinite Integrals and definite integrals	S Banerjee	01
Lab Session	S Roy	01
Introduction to Programming in SageMath	S Banerjee	03
Lab Session	S Roy	03
Use of inbuilt functions	D Mandal	02
Lab Session	D Mandal	02
Solving differential equations	T Choudhury	02
Lab Session	S Banerjee	02