Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur

Empowered Autonomous Institution

Department of Physics and Electronics

A) A Summary Report of the Activity

1) Title of Programme:		Bridge Course in Mathematics for M.Sc. Physics		
2) Name of Organizing Department/ Unit:		Department of Physics and Electronics		
3) Name of the Coordinator(s)/ Convener(s)/ Organizer(s) of the Programme:		Chief Organizer: Dr Mahadev Gavhane, Principal HoD: Dr Abhijit Yadav Course Coordinator: Miss Vishakha Patil		
4) Date(s) of the Programme:		06/07/2026 to 11/08/2026 (Daily 09:30 AM to 10:30 AM)		
5) Venue/Mode:		Photonics Laboratory, Department of Physics and Electronics		
6) Target Group:		M.Sc. Physics First Year Students		
7) Number of Participants:		Male	Female	Total
A separate list with signatures be maintained in the department/Unit)	Teaching	--	--	--
	Non-Teaching	--	--	--
	Students	04	04	08
8) Details of Resource Persons / Faculty:		Departmental Faculty Members, Department of Physics and Electronics, Rajarshi Shahu Mahavidyalaya, Latur		
9) Total Expenditure for the Programme:		Nil		
10) Source of Funding:		Rajarshi Shahu Mahavidyalaya, Latur		

B) Report

i. Title: Bridge Course in Mathematics for M.Sc. Physics

ii. Introduction

Physics at the M.Sc. level requires a rigorous mathematical background. Students entering M.Sc. Physics come from diverse UG academic backgrounds (B.Sc. Physics, B.Sc. General Science) with varying degrees of mathematical proficiency. Fundamental mathematical tools-including differential equations, vector calculus, linear algebra, integration techniques, logarithms, trigonometry, and special functions-form the core language of classical mechanics, quantum mechanics, electromagnetic theory, and statistical physics.

To bridge the gap between UG mathematical preparation and PG analytical physics, the Board of Studies in Physics at Rajarshi Shahu Mahavidyalaya, Latur designed a specialized 30-lecture intensive Bridge Course in Mathematics. The course was conducted in the Photonics Laboratory from 6th July 2026 to 11th August 2026, daily from 09:30 AM to 10:30 AM, under the coordinatorships of Miss Vishakha B. Patil.

iii. Objectives of the Bridge Course:

- To standardize mathematical competencies among newly admitted M.Sc. Physics First Year students.
- To strengthen foundational concepts in quadratic equations, binomial expansions, logarithmic calculations, trigonometric identities, differential calculus, and integral calculus.
- To demonstrate direct physical applications of mathematical concepts in solving M.Sc. physics problems.
- To eliminate mathematical anxiety and build confidence in handling analytical physics equations.

iv. Details of Participants

08 (Male 04 and Female 04) students successfully completed the whole course duration from 06/07/2026 to 11/08/2026 with required attendance and topic evaluations.

v. Curriculum Modules:

The Bridge Course curriculum comprised 6 specialized modules delivered across 30 contact hours:

1. Module I: Quadratic Equations and Solutions (05 Lectures)

Review of quadratic algebraic forms, roots, discriminant analysis, and application to physical trajectory and wave equations.

2. Module II: Binomial Theorem (05 Lectures)

Binomial theorem for positive integral and fractional indices, series expansions, and approximations commonly used in relativistic and quantum physics.

3. Module III: Logarithms & Computational Techniques (05 Lectures)

Natural and common logarithms, laws of logarithms, change of base, antilogarithms of negative numbers, and usage of log tables in physics calculations.

4. Module IV: Trigonometry and Angle Systems (05 Lectures)

Radian measure, trigonometric ratios of allied angles, trigonometric identities, and phase representation in wave optics and oscillations.

5. Module V: Differential Calculus (05 Lectures)

Rates of change, derivatives of trigonometric, logarithmic, and exponential functions, product and chain rules, and physical interpretation of derivatives as velocity, gradient, and flux.

6. Module VI: Integral Calculus & Applications (05 Lectures)

Fundamental integration formulas, definite integrals, substitution methods, and applications of integration in calculating work done, electric potential, and center of mass.

vi. Outcomes and Impact Assessment:

The Bridge Course in Mathematics achieved its targeted academic goals:

- **Enhanced Analytical Readiness:** Participating students demonstrated significant improvement in solving derivative and integral problems related to core M.Sc. Physics subjects.
- **Improved Classroom Engagement:** Faculty members noted increased participation and confidence during regular M.Sc. Physics lectures in Mathematical Physics and Quantum Mechanics.
- **Evaluated Academic Performance:** Continuous classroom evaluation confirmed that 08 students successfully mastered the core mathematical techniques required for M.Sc. coursework.

vii. Conclusion, with Feedback

The Bridge Course served as an essential academic orientation for M.Sc. Physics students, establishing a uniform mathematical baseline across the cohort. Participant feedback highlighted the practical value of problem-solving sessions in the Photonics Laboratory and appreciated the daily morning schedule (09:30 AM – 10:30 AM). The Department of Physics and Electronics recommends continuing this bridge initiative for future academic sessions.

viii. Any Appendix If Necessary

List of participants.

Place: Latur

Date: 14/08/2026

HoD

HEAD
Department of Physics & Electronics
Rajarshi Shahu Mahavidyalaya,Latur
(Autonomous)

RAJARSHI SHAHU MAHAVIDYALAYA (AUTONOMOUS) ★LATUR★

Principal

PRINCIPAL
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)

C) Notice to the students:

Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur

(Empowered Autonomous)

(Department of Physics and Electronics)

स्थापना - १९७०

Notice: Bridge Course

Date: 01/07/2026

All the students of M.Sc. Physics (First Year) are hereby informed that a Bridge course has been organized to strengthen the fundamental concepts required for the postgraduate studies.

Course Duration: **06/07/26 to 11/08/26**
Time: **(09:30 – 10:30) AM**
Place: **Photonics Lab**
Note: All should attend the classes regularly.

Head
Department of Physics & Electronics

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RAJARSHI SHAHU MAHAVIDYALAYA (AUTONOMOUS) LATUR

Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur

Empowered Autonomous Institution



Bridge Course in Mathematics for M.Sc. Physics I
(Academic Year 2026-27)

Board of Studies

in

Physics

Rajarshi Shahu Mahavidyalaya, Latur

Empowered Autonomous Institution

[PG I Year]

w.e.f. June, 2026

(In Accordance with NEP-2020)

Academic Year 2026-27

Contents

Sr No	Module	Lectures
I	Quadratic Equation and its Solution	05
II	**Binomial Theorem** (Binomial Theorem and Binomial theorem for positive integral index)	05
III	**Logarithms** (Indices, Natural and Common Logarithm Laws of logarithms, logarithm of 1, Change of base, using log table, Using log for calculation, Antilog of negative number)	05
IV	**Trigonometry** (Angle, System of Measurement of an angle, Definition of a radian, Trigonometric ratios for angles in a right- angled triangle, Sign of an angle in any quadrant, Trigonometrical Ratios of Allied Angles, Trigonometric identities)	05
V	**Differentiation** Constant Rate of Change, Rate of Change that is Not Constant, Differential coefficient or derivative of a function, Theorems of Differentiations, Differential coefficients of: Trigonometric Functions; Logarithmic and Exponential Functions	05
VI	**Integration** (Fundamental Formulae of Integration, Theorems of Integration, Definite integral, Application of integration in Physics, Some important Integration formulas, Integration by parts)	05

Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur

(Empowered Autonomous Institution)

(Department of Physics and Electronics)

M.Sc. I Year (Semester I)

Bridge Course (2026-27)

Sr. No	Roll No	Name of the Student	06/07/26	07/07/26	09/07/26	10/07/26	11/07/26	13/07/26	14/07/26	15/07/26	16/07/26	17/07/26
1	01	Birajdar Ashwini. D	–	–	–	–	–	–	–	–	–	–
2	02	Burbure Rushikesh. S	P	P	P	P	P	P	P	P	P	P
3	03	Kalshetty Santosh. J	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh
4	04	Makude kartikay. R	–	–	–	–	–	MK	MK	MK	MK	MK
5	05	Pawar Shruti.G	Shruti	Shruti	Shruti	Shruti	–	Shruti	Shruti	Shruti	Shruti	
6	06	Salunke Rameshwar G	–	–	–	R	R	R	R	R	R	R
7	07	Vibhute Shivraj. S	–	–	–	–	–	–	–	–	–	–
8	08	Wangawad Trupti. R	–	Trupti	Trupti	–	–	Trupti	Trupti	Trupti	Trupti	Trupti
9	09	Zipre Shweta. S	–	–	–	–	–	Shweta	Shweta	Shweta	Shweta	Shweta
10	10	Maske Prerana. T	–	Prerana	–	Prerana	Prerana	Prerana	Prerana	–	–	Prerana
11	11	Abhay Rathod. A	–	–	–	–	–	–	–	–	–	–

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Rajarshi Shahu Mahavidyalaya, Latur

(Empowered Autonomous Institution)

(Department of Physics and Electronics)

M.Sc. I Year (Semester I)

Bridge Course (2026-27)

Sr. No	Roll No	Name of the Student	18/07/26	20/07/26	21/07/26	22/07/26	23/07/26	24/07/26	28/07/26	29/07/26	30/07/26	31/07/26
1	01	Birajdar Ashwini. D	–	–	–	–	–	–	–	–	–	–
2	02	Burbure Rushikesh. S	P	P	P	P	P	P	P	P	P	P
3	03	Kalshetty Santosh. J	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh	Santosh
4	04	Makude kartikay. R	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD
5	05	Pawar Shruti.G	Shruti	Shruti	–	–	–	–	–	–	–	–
6	06	Salunke Rameshwar G	R	R	R	R	R	R	R	R	R	R
7	07	Vibhute Shivraj. S	–	–	–	–	–	–	–	–	–	–
8	08	Wangawad Trupti. R	–	T	T	T	T	T	T	T	T	T
9	09	Zipre Shweta. S	S	S	S	S	–	S	S	S	S	S
10	10	Maske Prerana. T	–	–	P	P	P	P	P	P	P	P
11	11	Abhay Rathod. A	–	–	–	–	–	–	–	–	–	–

HoD

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Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur

(Empowered Autonomous Institution)

(Department of Physics and Electronics)

M.Sc. I Year (Semester I)

Bridge Course (2026-27)

Sr. No	Roll No	Name of the Student	01/08/26	03/08/26	04/08/26	05/08/26	06/08/26	07/08/26	08/08/26	10/08/26	11/08/26	
1	01	Birajdar Ashwini. D	-	-	-	-	-	-	-	-	-	
2	02	Burbure Rushikesh. S	P	P	P	P	P	P	P	P	P	
3	03	Kalshetty Santosh. J	Santosh	Santosh	-	Santosh	Santosh	-	Santosh	Santosh	Santosh	
4	04	Makude kartikay. R	MK	MK	MK	MK	MK	MK	MK	MK	MK	
5	05	Pawar Shruti.G	-	-	-	-	-	-	-	-	-	
6	06	Salunke Rameshwar.G	R	R	R	-	-	-	-	-	R	
7	07	Vibhute Shivraj. S	-	-	-	-	-	-	-	-	-	
8	08	Wangawad Trupti. R										
9	09	Zipre Shweta. S							-			
10	10	Maske Prerana. T				-	-					
11	11	Abhay Rathod. A	-	-	-	-	-	-	-	-	-	

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