

*Shri Shivaji Education Society Amravati's*  
**Science College, Congress Nagar, Nagpur**  
*Internal Quality Assurance Cell*

DEPARTMENT OF PHYSICS

**INTERNAL ACADEMIC AUDIT**

**2021-2022**

1. A. Faculty Strength:

Faculty	Recruited	Vacant	Remarks
Regular	06	02	
CHB	04	00	
Ad-hoc	03	00	
Non-teaching	03+02	00	

B. Faculty profile

Name	Highest Qualification	Designation	Specialization	Teaching Experience
1. Prof. S. W. Anwane	Ph.D.	Professor	Materials Science	22 Yrs
2. Dr R N Pathare	Ph.D.	Assistant Professor	Materials Science	15 Yrs
3. Dr S V Khangar	Ph.D.	Assistant Professor	Ultrasonics, Condensed Matter Physics	03 Yrs
4. Mr B T Kumbhare	M.Sc.,SET	Assistant Professor	Materials Science	03 Yrs
5. Dr S K Sayyad	Ph.D.	Assistant Professor	Materials Science	03 Yrs
6. Dr. G. L. Jadhav	Ph.D.	Assistant Professor	Electronics	03 Yrs
7. Ms Isha Kapte	M.Sc.	Assistant Professor (Ad-hoc)	General	02 Yrs
8. Mr Yashpal Pawar	M.Sc.	Assistant Professor (Ad-hoc)	General	02 Yrs

9. Ms Roshni Pahuja	M.Sc.	Assistant Professor (Ad-hoc)	General	01 Yr
10. Dr. S.S. Pote	Ph.D.	Assistant Professor (CHB)	Materials Science	10 Yrs
11. Chaitanya Gajbhiye	M.Sc.	Assistant Professor (CHB)	General	00 Yrs
12. Amit Meshram	M.Sc.	Assistant Professor (CHB)	General	00 Yrs
13. Dr.Minakshi Ghate	Ph.D.	Assistant Professor (CHB)	Materials Science	10 Yrs

## 2. Student's strength

Year	Group	Number of Students Admitted
B.Sc. Semester I	PCM	53
	PCsM	55
	PEM	27
	PCG	19
	<b>Total</b>	<b>154</b>
B.Sc. Semester III	PCM	53
	PCsM	27
	PEM	50
	PCG	17
	<b>Total</b>	<b>147</b>
B.Sc. Semester V	PCM	52
	PCsM	51
	PEM	21
	PCG	22
	<b>Total</b>	<b>146</b>
M.Sc. Semester I		<b>24</b>
M.Sc. Semester III		<b>26</b>
Ph.D.		<b>03</b>
Value Added Program		<b>00</b>
	<b>Grant Total</b>	<b>500</b>

## 3. Student's Performance

### A. Result Analysis (Winter 2021) UG & PG

Programme Name	Number of students appeared in the final year examination	Number of students passed in final year examination	Pass Percentage
B. Sc.	146	146	100%
M.Sc.	24	24	100%

## B. Result Analysis (Summer 2022) UG & PG

Programme Name	Number of students appeared in the final year examination	Number of students passed in final year examination	Pass Percentage
B. Sc.	146	146	100%
M.Sc.	24	24	100%

## C. Achievements

### A- (Medals/Awards/Prizes at University level)

Sr. No.	Name of the Students	Class	Title
1	Miss. Niharika V. Saxena <b>Secured 2<sup>nd</sup> Prize</b>	B. Sc. SEM VI	VUPTA Seminar Competition
2	Abhinav P. Gotmare <b>Secured 1<sup>st</sup> prize</b>	B. Sc. SEM IV	VUPTA Seminar Competition
3	Mayur Bedarkar <b>Secured 1<sup>st</sup> prize</b>	M.Sc. SEM-IV	VUPTA Seminar Competition
4	Anuj Khapekar	B. Sc. SEM VI	Top IAPT Rank
5	Abhinav P. Gotmare <b>Secured 2nd Rank</b>	B. Sc. SEM IV	National Science Day celebration on Demonstration of Physics Experiment
6	Abhinav P. Gotmare	B. Sc. SEM	AUPTA Presentation Competition of Experiment

	<b>Secured 3rd Position</b>	IV	Demonstration at GSG Mahavidyalaya, Umerkhed
7	Abhinav P. Gotmare <b>Secured 3rd Position</b>	B. Sc. SEM IV	State Level online Powerpoint Presentation Competition by Kamla Nehru College, Nagpur
8	Anuj Khapekar	B. Sc. SEM VI	AIR 1637 in JAM Exam
9	Parth Hedau	B. Sc. SEM VI	AIR 587 in JAM Exam

#### B- Merit Position of UG Students in RTMNU

Sr. No.	Name of the Students	Merit Position

#### C- Merit Position of PG Students in RTMNU

Sr. No.	Name of the Students	Merit Position

#### 4. Student's Progression:

No. of students enrolling in higher Education	Name of institution joined	Name of program admitted to
UG to PG	Shivaji Sc College, Nagpur	02
	IIT-Jodhpur	01
	VNIT-Nagpur	01
PG to Research	Glasgow University, Scotland UK	01
Placement	Mansi Vilas Dhenge placed as Indian Navy - Agniveer	Agniveer
On-Campus	Ms Kanchan Jivnapurkar joined Shivaji Sc. College, Nagpur	Ad-hoc Lecturer
	Ms Chanda Jatgade joined Shivaji Sc College, Nagpur	

Off-Campus		
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(i) Students' publication in Conferences/ Journals:

Title of the Paper	Name of Author	Title of journal	Year of publication

(ii) Students' participation in Seminar/ Conferences:

Sr. No.	Name of Students	Conference type	Participation as
1.	Ms Chanda Jatgade	National Seminar on Advanced Functional Materials AFM-2022	Delegate and presented poster at VNIT, Nagpur on 18-10-2022
2.			
3.			

(iii) Students' Extension Activity/ Extracurricular activity

Sr. No.	Name of the activity	Number of students Participated
1	<p style="text-align: center;"><b><u>Udemy Course Instructor</u></b></p> <p>Udemy has approved and made live on 23th Nov 2021 the course A boot camp to the Special Theory of Relativity. This course is for amateurs as well as for those pursuing undergraduate programme. In this course, we will begin with the history of formulation of the special theory of relativity and will derive Einstein's famous equation <math>E = MC^2</math>. We shall conventionally build the subject, that covers syllabi's of most of the universities looking at the student's interest. This course essentially covers all the traditional topics. In the last lecture Relativistic Lagrangian is developed to quickly descend upon energy and relativistic momentum. This course has video lecture content of 8.5 hrs that is divided into 4 sections spread over 27 lectures followed by a Quiz at the end of each lecture.</p> <p><b>2275 STUDENTS 4.66 RATING 51 REVIEWS in December 2022</b>  <a href="https://www.udemy.com/course/a-boot-camp-to-special-theory-of-relativity/">https://www.udemy.com/course/a-boot-camp-to-special-theory-of-relativity/</a></p>	2275
2	<p style="text-align: center;"><b><u>Udemy Course Instructor</u></b></p>	1164

	<p>Udemy has approved and made it live on 23rd May 2022 the course A boot camp to Nuclear Physics. This course is for amateurs as well as for those pursuing undergraduate program in Physical Sciences and Medical sciences. This course has video lecture content of 10 hrs that is divided into 7 sections spread over 48 lectures followed by a Quiz at the end of each section. This course expectedly covers all the traditional topics that are part of the Undergraduate Program in most Universities. Amateurs in Physics and those having love for Physics can quench their thirst for learning by subscribing to this online program.</p> <p><b>1164 STUDENTS 4.69 RATING 34 REVIEWS in November 2022</b></p> <p><a href="https://www.udemy.com/course/a-boot-camp-to-nuclear-physics/">https://www.udemy.com/course/a-boot-camp-to-nuclear-physics/</a></p>	
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(iv) Participation of Students in online/MOOCs courses/ NPTEL/ SWAYAM

Sr. No.	Name of the Students/Teachers	MOOCs / NPTEL/ SWAYAM
1	<u>Prof. S. W. Anwane</u>	Qualified with 87.05% score in a 8 weeks COURSERA <b>Course Introduction to Complex Analysis</b> conducted by Wesleyan University, Connecticut, United States (15-06-2021).
2	<u>Prof. S. W. Anwane</u>	Completed a 3.5 hrs Udemy Course <b>Differential Equations</b> in Depth conducted by the instructor Dmitri Nesteruk (17th January 2022).
3	<u>Prof. S. W. Anwane</u>	Completed a 2.5 hrs Udemy Course <b>15 Awesome Ways To Promote Your Udemy Course</b> – Unofficial conducted by the instructor Dave Espino (21st January 2022).
4	<u>Dr. R.N.Pathare</u>	A Bootcamp to Special Theory of Relativity - UDEMY
5	<u>Mr. B.T.Kumbhare</u>	A Bootcamp to Special Theory of Relativity - UDEMY
6	<u>Dr. S.K.Sayyad</u>	A Bootcamp to Special Theory of Relativity - UDEMY
7	<u>Dr. S.K.Sayyad</u>	Experimental Techniques in Physics - SWAYAM
8	Bhushan Kishor Dange	A Bootcamp to Special Theory of Relativity - UDEMY
9	Pallavi Krishna Khadase	A Bootcamp to Special Theory of Relativity - UDEMY
10	Shraddha Sanjay Warbhe	A Bootcamp to Special Theory of Relativity - UDEMY
11	Pawan Dongre	A Bootcamp to Special Theory of Relativity - UDEMY
12	Viplov Dhoke	A Bootcamp to Special Theory of Relativity - UDEMY
13	Keshav Kavadu Bhagat	A Bootcamp to Nuclear Physics - UDEMY
14	Keshav Kavadu Bhagat	A Bootcamp to Special Theory of Relativity - UDEMY
15	Satish Rahangdale	A Bootcamp to Nuclear Physics - UDEMY
16	Bhumesh Madhukar Uikey	A Bootcamp to Special Theory of Relativity - UDEMY
17	Mayur Shivankar	A Bootcamp to Special Theory of Relativity - UDEMY

18	Chanda Prakash Jatgade	Bootcamp to Special Theory of Relativity - UDEMY
19	Chanda Prakash Jatgade	A Bootcamp to Nuclear Physics – UDEMY
20	<u>Mr. B.T.Kumbhare</u>	MSFDA Workshop
21	<u>Dr Sugandha V Khangar</u>	NPTEL Certification in EXP. Physics-III

## 5. Faculty

### I. Research Paper Publications

#### A. Total Number of publications:

- i) International 06
- ii) National 00

#### B. Bibliometrics of the publications during the last Academic year based on average citation index in Scopus/ Web of Science or PubMed/ Indian Citation Index

Title of the Paper	Name of Author	Title of journal	Year of publication	Citation Index	Institutional affiliation as mentioned in the publication	Number of citations excluding self-citation
1 Special Relativity using Perplex Numbers,	S W Anwane	Adv Appl Sci Res Vol. 12 No. 4:16	2021		Shri Shivaji Education Society Amravati's Science College, Nagpur	
2 Structural and Dielectric Properties of Polyvinyl Alcohol-TiO <sub>2</sub> Doped Thin Films	R N Pathare	Macromol. Symp. 2021, 400, 2100014 DOI: 10.1002/masy.202100014	2021		Department of Physics Mahatma Fule Arts Commerce & Sitaramji Chaudhari Science College Warud, Maharashtra 444906, India	
3 OPTIMIZATION FOR ENERGY CONSUMPTION OF VAPOUR COMPRESSION REFRIGERATION SYSTEM IN DINSHAWS FOOD LIMITED, NAGPUR	R N Pathare	Vidyabharati International Interdisciplinary Research Journal	2021		Shri Shivaji Equation Society, Amravati's, Science College, Nagpur, MS, India	

4 Study of structural electrical and magnetic characterization of (1-x) BiFeO <sub>3</sub> -xBaTiO <sub>3</sub> solid solution	S. K. Sayyad	Ferroelectrics 2022,vol.587,63-69 <a href="https://doi.org/10.1080/00150193.2022.2034415">https://doi.org/10.1080/00150193.2022.2034415</a>	2022		Shri Shivaji Equation Society, Amravati's, Science College, Nagpur, MS, India
5 Synthesis and Nonlinear Optical Absorption of L-Valine Capped Zn-Doped MgO Nanoparticles	S.V.Khangar	Micromolecular Symposia	2021		Mathatma Fule Arts, Commerce and Sitaram Choudhary Science College WARDUD
6 Structural, Optical and Magnetic Properties of Diamagnetic Cd <sup>2+</sup> Incorporated Cobalt Ferrite Thin Films Deposited by Spray Pyrolysis	G.L.Jadhav	J of Electronic Materials	2021		Shri Shivaji Equation Society, Amravati's, Science College, Nagpur, MS, India

### C. Faculty participation in conferences/seminar/workshop and symposia:

Name of the Faculty	Title of Conference/ Seminar/ workshop Attended	Period	Level International/ National/State /University /College	Whether Presented papers	Whether abstract /paper published in Souvenir/Abstract Book
S W Anwane	Innovation in Science and Technology in Science, Technology, Agriculture, Humanities and e-commerce for Sustainable Ruler Development	14-15 March 2022	International	Chaired a Technical Session	No
B. T. Kumbhare	MS-DEED Level 1 Online Workshop on Introduction to Innovative Pedagogies for UG Teachers	25-27 April 2022	State	Participated	No
R J Dhokne-Pathare	Advances in Mathematical & Physical Science	16-30 Nov 2021	Online UGC Refresher Course	Participation	No
G L Jadhav	ICT Applications & Soft skills (Physics)	10-22 Jan 2022	Online Refresher Course	Participation	No



S V Khangar	ICT Applications & Soft skills (Physics)	10-22 Jan 2022	Online Refresher Course	Participation	No
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#### D. Awards to Faculty members

Name of Teacher	Title of the Award	Title of Agency/ Conference	National / International
S W Anwane	Best Researcher Award for 2020-21	Parent Institute: Shri Shivaji Equation Society, Amravati's, Science College, Nagpur, MS, India	

#### 6. MoUs signed with institutions of national and international importance, other universities, industries, corporate houses etc. during the year

Date of MOU	Organization	Purpose/Activity	Student Participate under MOU

#### 7. Research funds sanctioned and received from various agencies, industry and other organizations

Nature of the Project	Duration	Name of funding Agency	Amount Sanctioned	Amount Received

#### 8. Books Published

	Book		Book Edited
	Title	ISBN and Date	Chapter
1	The Special and General Theory of Relativity <a href="https://amzn.to/3xX9H7k">https://amzn.to/3xX9H7k</a>	ISBN: 9798539250829	

#### 9. Research Guidance by Faculty during the year

Name of the guide	Ph.D.		
	Awarded	Submitted	Registered
S W Anwane	01	01	01

R N Pathare (Dhokne)			01

\* (i) Mrs. Chaitali Keche Pangul submitted Ph.D. thesis entitled **Photoluminescence properties of Rare Earth Ion Doped ZnO Nano-fibres**. Date of Registration 14/05/2015 and Thesis submitted on 3/8/2019 **AWARDED** vide Notification RTMNU/Ph.D.(Cell)/17/1927 03-01-2022).

(ii) Ms Ruhi Naz submitted Ph.D. thesis entitled *Understanding of oxy-ion conductivity of  $La_{2-x}A_xMo_{2-y}B_yO_{9-\delta}$  system: in view of electrolyte for IT-SOFCs* was Registered for Ph.D. programme on 12-01-2017 and thesis submitted to RTM Nagpur University on 30-8-2021

(iii) Amrapali Patil registered Ph. D., entitled *Development of Composites Polymer Phosphors for Fabric Designing RTMNU/PH.D CELL/RRC/2022/R1/951 dated 23-05-2022*

10. Generation of funds through internal and external sources such as donations, consultancy, self-financing courses and so on.

<b>Name of the non-government funding agencies/ individuals/ self-financing courses /consultancy service.</b>	<b>Purpose of the Grant/Fund</b>	<b>Fund generated in rupees.</b>
Provided PL, FTIR characterization Services to a large number of Students (72 samples) of the college and others professionally @ Rs 100/- per sample and generated consultancy. This promotional rate can be raised to Rs 200 per specimen from 1-1-2023.	To maintain the laboratory contingency expenses and improvement of facilities	Rs. 7,200/-

11. Alumni engagement

a. Contributes significantly to the development of the institution through financial and other supports

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11. Action Plan of the Department

- (i) To achieve excellence in classroom teaching
- (ii) To tap curiosity of students in laboratory hands on experience
- (iii) Extension activity – Shivaji Space Explorer Club, Visit to RSC
- (iv) Expand consultancy activity

## 12. Best Practices of the department

- (i) Conducting regular Students Seminar
- (ii) Closely monitoring students and accordingly rewarding marks for tests, attendance, assignments, and performance in practical.
- (iii) Encouraging projects leading to fabrication of devices and working models
- (iv) Consultancy activity using SIL initiated

## 13. SWOC Analysis

**S**-conductive atmosphere, openness for activities, good infrastructure, highly qualified supporting staff, Sophisticated Instrumentation Laboratory, Physics Society – a platform for all stakeholders, e-resource created by all faculty member, students centric approach in the department.

**W**- placement in Physics except teaching field if difficult, connect with industry, no research project

**O**-exploring Sophisticated Instrumentation Laboratory for research and consultancy, Wide diverse area of applications can attract students & teachers interest, Research Grants can be brought as we are 2(f) and 12(B)

**C**-attract students for learning as they are less interested in learning in a post covid scenario.

Date: 12-01-2023

Head of the Department

## A brief review of Extra Curricular activities

**Students Induction Programme - 1<sup>st</sup> Oct 2021, Nagpur:** “*I can*” is sometimes more important than “*IQ*” – Dr Sunil Pande, Ex-HOD, Department of Physics, Ramdeobaba College of Engineering & Management (RCOEM). Students Induction Programme was organized for the newly inducted M.Sc. Physics Students of 2021 at the Department of Physics, Shri Shivaji Science College, Nagpur. Due to the Covid-19 norms, the program was held online.

Dr. Sunil Pande, Ex-HOD, Department of Physics, RCOEM was the Chief guest to address the students. While speaking he stated that the study of Physics is also an adventure. You will find it challenging, sometimes frustrating, occasionally painful and often richly rewarding. Further, he added, Imagination is more important than knowledge. Students should not study only from the examination point of view, but they should grab all the basic knowledge of physics. He motivated and inspired all the students with his remarkable speech.

In November 2021, faculty members had procured a 10” Dobsonian Astronomical telescope. A webinar was organized by **Shivaji Space Explorer Club** on ‘GSNST-A sky survey to search for transient using an array of Robotic Telescopes’ delivered by Mr. Malhar Kendurkar, President at Prince George Astronomical Observatory, Canada - alumni of Shivaji Science College, Nagpur. Physics society and Department of Physics held a webinar on ‘Advanced Functional Materials’ which was delivered by Dr. Oroosa Subohi, Asst. Professor, VNIT. In December 2021, a guest lecture was organized on ‘Molecular Spectroscopy’ which was delivered Dr. S S Dhondge, Ex-Principal of SK Porwal College.

Every faculty member of the department are doing various courses and organizing various workshops, and activities for themselves and students’ growth.

The Physics Society is formulated every year that offers a platform to students to organize academic activities throughout the year. Students go beyond their degrees for getting exposure to their hidden talents, organize guest lectures, etc. On the eve of the Birth anniversary of Dr. Panjabrao Deshmukh, various competitions were held in which- Mayur Bedarkar (MSc. SEM-IV) secured 1<sup>st</sup> prize in Elocution and Quiz competition. Also, Chanda Jatgade (MSc. SEM-IV) bagged 1<sup>st</sup> prize in Quiz competition.

In the year 2022, Abhinav Gotmare (BSc. SEM-IV) bagged 2<sup>nd</sup> prize in a competition on Presentation and Demonstration of physics experiments held by Shri. Shivaji Science College, Amravati. Abhinav Gotmare (BSc. SEM-IV) and Mayur Bedarkar (MSc. SEM-IV) secured 1<sup>st</sup> prize, Niharika Saxena (BSc. SEM-IV) secured 2<sup>nd</sup> prize in VUPTA seminar competition held at Vidya Vikas Arts, Commerce and Science college, Samudrapur. Moreover, Abhinav Gotmare (BSc. SEM-IV) bagged 3<sup>rd</sup> prize in Innovative experiments presentation competition held by AUPTA at Gopikabai Sitaram Gawande Mahavidyalaya, Yavatmal. In April 2022, a guest lecture was organised by physics society on ‘Fermi-condensate: the sixth state of matter?’ which was delivered by Prof. Subhash Kondawar, Professor, Dept of physics, RTMNU. Moreover, a guest lecture was held on ‘Medical Physics and Career Opportunities’ which was delivered by Mr. Anurag Kulkulewar- alumni of Shivaji Science College, Nagpur. One of the students of our department - Mr. Parth Hedao (B.Sc. III) cleared **JAM 2022** exam in Physics by securing **AIR-587** and secured admission in **IIT Jodhpur**. He also secured a position in the top 25 students in National Graduate Physics Examination 2022.

**Academic Audit Report**  
**Department of Physics**  
**Shri Shivaji Education Society Amravati's**  
**SCIENCE COLLEGE**  
**2021-22**