



Academic Audit Report
for Academic Year
2022-23

Department of Physics

Shri Shivaji Education Society Amravati's

SCIENCE COLLEGE

NAGPUR

Shri Shivaji Education Society Amravati's
Science College, Congress Nagar, Nagpur

Internal Quality Assurance Cell

DEPARTMENT OF PHYSICS

INTERNAL ACADEMIC AUDIT

2022-2023

1. A. Faculty Strength:

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

B. Faculty profile

Name	Highest Qualification	Designation	Specialization	Teaching Experience
1. Prof. S. W. Anwane	Ph.D.	Professor	Materials Science	23 Yrs
2. Dr R N Pathare	Ph.D.	Assistant Professor	Materials Science	16 Yrs
3. Dr S V Khangar	Ph.D.	Assistant Professor	Ultrasonics, Condensed Matter Physics	4 Yrs
4. Mr B T Kumbhare	M.Sc., SET	Assistant Professor	Materials Science	04 Yrs
5. Dr S K Sayyad	Ph.D.	Assistant Professor	Materials Science	04 Yrs
6. Dr. G. L. Jadhav	Ph.D.	Assistant Professor	Electronics	04 Yrs
Ms Swapnil Belkhude	M.Sc., SET	Assistant Professor (Ad-hoc)	General	01 Yrs
Ms Kanchan Jiwnapurkar	M.Sc.	Assistant Professor (Ad-hoc)	General	01 Yrs

Ms Chanda Jatgade	M.Sc.	Assistant Professor (Ad-hoc)	General	01 Yr
Mr. Sarang Daf	M.Sc.,SET	Assistant Professor (CHB)	Materials Science	7 Yrs
Krishna Gangulwar	M.Sc.,SET	Assistant Professor (CHB)	General	01 Yrs
Manish Dhawle	M.Sc.,SET	Assistant Professor (CHB)	General	02 Yrs

2. Student's strength

Year	Group	Number of Students Admitted
B.Sc. Semester I	PCM	48
	PEM	23
	PCsM	52
	PCG	28
	Total	151
B.Sc. Semester III	PCM	46
	PEM	25
	PCsM	55
	PCG	18
	Total	144
B.Sc. Semester V	PCM	54
	PEM	28
	PCsM	53
	PCG	18
	Total	153
M.Sc. Semester I		19
M.Sc. Semester III		25
Ph.D.		03
Value Added Program		
	TOTAL	495

P. G. STUDENT INDUCTION PROGRAMME[1-3]	Yes, No
ACADEMIC PLANNINGS	Yes, No
BRIDGE COURSE TAUGHT	Yes, No
REMEDIAL COURSE TAUGHT	Yes, No

3. Student Performance

A. Result Analysis (Winter 2022) UG & PG

Programme Name	Number of students who appeared in the final year examination	Number of students who passed in final year examination	Pass Percentage
B.SC. Sem- I	141	65	46.09
B.SC. Sem-III	144	75	52.08
B.SC. Sem-V	153	143	95.97
M. Sc. Sem-I	19	07	36.84
M. Sc. Sem-III	23	14	60.87

B. Result Analysis (Summer 2022) UG & PG

Programme Name	Number of students who appeared in the final year examination	Number of students who passed in final year examination	Pass Percentage
B.SC. Sem- II	122	47	38.52
B.SC. Sem-IV	137	86	62.77
B.SC. Sem-VI	147	126	85.71
M. Sc. Sem-II	14	05	35.71
M. Sc. Sem-IV	23	10	43.48

C. Achievements

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

Sr. No.	Name of the Students	Class	Title
1	Miss. Anushka Palandurkar Secured 1st Prize	B. Sc. SEM II	VUPTA Seminar Competition
2	Miss. Anushka Palandurkar Secured 2nd Prize	B. Sc. SEM II	Elocution Competition in VUPTA 2023
3	Abhinav P. Gotmare Secured 3rd prize	B. Sc. SEM VI	VUPTA Seminar Competition
4	Mayur Shivankar Secured 2nd^t prize	M.Sc. SEM- IV	VUPTA Seminar Competition
5	Riya Faldu Secured 3rd prize	M.Sc. SEM-II	Poster Presentation in VUPTA 2023

6	Suhani Thakare Secured 3rd prize	B. Sc. SEM II	Science Quiz competition in VUPTA 2023
7	Abhinav P. Gotmare Secured 2nd Prize	B. Sc. SEM VI	State level Students Seminar Competition organized by J.B. College of Science, Wardha.
8	Mayur Shivankar Secured Consolation prize	M.Sc. SEM- IV	Elocution Competition organized by VMV-JMT Science College, Nagpur
9	Manasi Dhenge	B. Sc. SEM IV	Agniveer
10	Abhishek Jaiswal	B. Sc. SEM III	Agniveer
11	Tushar Bedekar	B. Sc. SEM IV	Agniveer
12	Ms Ishika Zarbade	B. Sc. SEM VI	secured admission through CAT in IIM Amritsar
13	Mr Abhinav Gotmare	B. Sc. SEM VI	secured admission in Integrated Ph.D. programme in Manipal Academy of Higher Education – Institute of Eminence
14	Ms Ashlesha Goswami,	pass-out student PCM group of the 2020 batch of our college	joined IISER Pune, for a Ph.D. program in Chemistry
15	Vaibhav Kakde	B. Sc. SEM VI	joined MCA NIT-Aurangabad.
16	Dhruv Dhoke	B. Sc. SEM VI	PGTD Physics RTMNU
17	Tanish Shukla	B. Sc. SEM VI	PGTD Physics RTMNU
18	Mukesh Turakne	B. Sc. SEM VI	PGTD Physics RTMNU

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 (3)	PGTD Physics RTMNU	M.Sc. Physics
PG to Research (1)	VNIT, Nagpur	Ph. D. Programme
Placement		
On-Campus		

Sr. No.	Name of the Students	Class	Title
1	Niharika V. Saxena	B. Sc. SEM VI	VUPTA Seminar Competition
2	Vaibhav G. Kakde	B. Sc. SEM IV	VUPTA Seminar Competition
3	Vinay R. Gawande	B. Sc. SEM IV	VUPTA Seminar Competition
4	Mayur S. Bedarkar	M.Sc. SEM- IV	VUPTA Seminar Competition
5	Kanchan B. Jiwnapurkar	M.Sc. SEM- IV	VUPTA Seminar Competition
6	Jay K. Chirekar	B. Sc. SEM IV	VUPTA Seminar Competition

(i) Students' publication in Conferences/ Journals:

Title of the Paper	Name of Author	Title of journal	Year of publication
Influence of lead glass on different properties of Lead Iron Niobate (PFN)	C.P. Jatgade, S.K. Saayad, T.Q. Quazi	Souvenir National Seminar on Advanced Functional Materials AFM-2022	October 2022
Photoluminescence of Eu ³⁺ Doped Calcium Penta boraaluminat (Sr _x Ca _{6-x} B ₅ AlO ₁₅) Phosphors	A. B. Patil, R.J. Dhokne, R. Y. Bakale	Souvenir National Seminar on Advanced Functional Materials AFM-2022	October 2022

(ii) Students' participation in Seminar/ Conferences:

(iii) Students' Extension Activity/ Extracurricular activity

Sr. No.	Name of the activity	The number of students who Participated
1	Udemy has recently approved and launched the course titled <i>A Boot Camp to the Special Theory of Relativity</i> on November 23, 2021. This course caters to both beginners and undergraduate students interested in delving into the subject. The course commences with an exploration of the historical background behind the formulation of the special theory of relativity, culminating in the derivation of Einstein's iconic equation, $E = mc^2$. It is designed to comprehensively cover the syllabi of various universities, ensuring alignment with the interests of students. Traditional topics integral to the subject are	2371 STUDENTS 4.62 RATING 60 REVIEWS in June 2023

	systematically addressed throughout the course. Spanning over 8.5 hours of video lecture content, the course is divided into four sections comprising a total of 27 lectures . Each lecture is followed by a quiz to reinforce learning and assess comprehension. Additionally, the final lecture introduces the Relativistic Lagrangian, facilitating a swift transition to the concepts of energy and relativistic momentum.	
2	Udemy has recently launched the course <i>A BootCamp to Nuclear Physics</i> , which went live on May 23, 2022. This course caters to both beginners and undergraduate students enrolled in Physical Sciences and Medical Sciences programs. Featuring a total of 48 lectures spread across 7 sections, the course offers approximately 10 hours of video lecture content. Each section is complemented by a quiz to reinforce learning and assess comprehension. Covering a wide range of topics traditionally included in undergraduate programs at universities, participants can expect a comprehensive exploration of nuclear physics. Designed to appeal to physics enthusiasts and individuals with a passion for the subject, this online program provides an excellent opportunity for amateurs and enthusiasts to deepen their understanding and satisfy their curiosity about nuclear physics.	1423 STUDENTS 4.49 RATING 60 REVIEWS in June 2023

(iv) Participation of Students in online/MOOCs courses/ NPTEL/ SWAYAM

Sr. No.	Name of the Students	MOOCs / NPTEL/ SWAYAM
1	Tanisha Shukla	Udemy Course A Boot Camp to Special Theory of Relativity
2	Tanisha Shukla	Udemy Course A Boot Camp to Nuclear Physics
3	Viplov Dhoke	Udemy Course A Boot Camp to Special Theory of Relativity
4	Viplov Dhoke	Udemy Course A Boot Camp to Nuclear Physics
5	Viplov Dhoke	Udemy Python for beginners- Learn all the basics of python
6	Viplov Dhoke	Introduction to Quantum Computing
7	Pawan Dongare	Udemy Course A Boot Camp to Special Theory of Relativity

8	Bhmesh Madhukar Ukey	Udemy Course A Boot Camp to Special Theory of Relativity
9	Anuj Ghatate	Udemy Course A Boot Camp to Special Theory of Relativity
10	Mayur Shivankar	Udemy Course A Boot Camp to Special Theory of Relativity
11	Dipak Vaidya	Udemy Course A Boot Camp to Special Theory of Relativity
12	Keshao Bhagat	Udemy Course A Boot Camp to Special Theory of Relativity
13	Keshao Bhagat	Udemy Course A Boot Camp to Nuclear Physics

(v) Participation of Teachers in online/MOOCs courses/ NPTEL/ SWAYAM

Sr. No.	Name of the Teacher	MOOCs / NPTEL/ SWAYAM
1	S W Anwane	Completed a 2.5 hrs Udemy Course 15 Awesome Ways To Promote Your Udemy Course - Un- official conducted by the instructor Dave Espino (21st January 2022).
2	S W Anwane	Completed a 3.5 hrs Udemy Course Differential Equations in Depth conducted by the instructor Dmitri Nesteruk (17th January 2022).
3	Dr. S. K. Sayyad	A Boot Camp to Nuclear, MOOC (UDEMY), 12.06.22 to 12.07.22
4	Dr. S. K. Sayyad	MS-DEED Level 1 InPerson Workshop on Introduction to Innovative Pedagogies for College Teachers, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur in Collaboration with Indian Institute of Science Education and

		Research Pune,17.11.22 to 19.11.22
5.	Dr. G. L. Jadhav	A Boot Camp to Nuclear,MOOC (UDEMY), 12.06.22 to 12.07.22
6	Mr. B. T. Kumbhare	A Boot Camp to Nuclear,MOOC (UDEMY), 12.06.22 to 12.07.22
7.	Dr. S. V. Khangar	A Boot Camp to Nuclear,MOOC (UDEMY), 15/ 05/2021 to 15/06/2022

5. Faculty

I. Research Paper Publications

A. Total Number of publications:

- i) International 01
- 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
Influence of Feed Ratio Variation on Structural and Thermal Properties of Pyrrole Aniline Copolymer	H V Ganvir, V Y Ganvir, V. D. Sonwane, B .T. Kumbhar , P. Kumar	Neuro Quantology	December 2022	1.3	Science College, Congress Nagar, Nagpur - 440012, India	

C. Faculty participation in conferences/seminars/workshops 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

Dr. S. V. Khangar	2 nd Global Conference on Recent Advancements in Sustainable Material(GC-RASM) 2022	28-29 July 2022	International Conference	Yes	Abstract
Dr. S. V. Khangar	Recent Trends in Material Science & Devices	22-23 July 2023	International Conference	Yes (Invited talk)	----
Dr. S. K. Sayyad	National Symposium on “ Functional Materials for Sustainable Development” - 2022	10-12 Oct 2022	National	Yes	-
Dr. S. K. Sayyad	“National Seminar on Ferroelectrics and Dielectrics (XXII NSFD - 2022)	17-19 Dec 2022	National	Yes	-
Dr. S. K. Sayyad	ISC 108th Indian Science congress	Jan 3-7, 2023	National	No	
Dr.S.W. Anwane	National Symposium on Functional Materials for Sustainable Development (FMSD-2022)	10-12 October 2022	National	Chaired Session (Key-note-address by Prof A. K. Tyagi, Divisional Director at BARC and Senior Professor at Dr. Homi Bhabha National Institute Mumbai)	
Mr. B. T. Kumbhare	ISC 108th Indian Science congress	Jan 3-7, 2023	National	No	-
Dr. S. V. Khangar	ISC 108th Indian Science congress	Jan 3-7, 2023	National	Yes	
Dr.S.W. Anwane	ISC 108th Indian Science congress	Jan 3-7, 2023	National	Yes	-
Dr. G. L. Jadhav	ISC 108th Indian Science congress	Jan 3-7, 2023	National	No	-
Dr R N Pathare	ISC 108th Indian Science congress	Jan 3-7, 2023	National	No	

Mr. B. T. Kumbhare	National level Seminar on “Fostering best practice and outreach activities in HEI with accordance to NEP 2020”	24th Nov. 2022	National	No	-
S W Anwane	5 Day Faculty Development Programme	10-14 Oct 2022	National	No	

D. Awards to Faculty members

Name of Teacher	Title of the Award	Title of Agency/ Conference	National / International
S W Anwane	Nominated on the Board of MAPLE Ambassador for SAARC region to inspire and educate others about the benefits that Maple brings to STEM Education.	Binary Semantics, Bangalore Partner of Waterloo MapleSoft CANADA	International

6. Number of functional MoUs with institutions, other universities, industries, corporate houses, etc. during the year

The organization with which MoU is signed	Year of signing MoU	Duration	List the actual activities under each MOU year wise	Number of students/teachers who participated under MoUs
SHRI MATHURADA S MOHTA SCIENCE COLLEGE, NAGPUR	2022	Five Years	—	—

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

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

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8. Books Published

	Book		Book Edited
	Title	ISBN and Date	Chapter
Dr. G. L. Jadhav			Optical properties of cobalt ferrite thin films prepared by spray pyrolysis

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	00	00	01

Supervisor for Mrs Ruhi Naz- *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* (Registered on 12-01-2017 and thesis **submitted** on 30-8-2021, **Viva Voce** on 17-4-2023, **AWARDED** doctorate vide Notification No.: RTMNU/Ph.D.(Cell)/01/660 dated 04-05-2023).

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

Name of the non-government funding agencies/ individuals/ self-financing courses /consultancy service.	Purpose of the Grant/Fund	Fund generated in rupees.
Provided PL, FTIR characterization Services to a large number of Students (242 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. 24,200/-

11. Alumni Engagement

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

12. Action Plan of the Department

- (i) Enhance classroom teaching to achieve excellence.
- (ii) Foster student curiosity through hands-on laboratory experiences.
- (iii) Initiate extension activities such as the Shivaji Space Explorer Club and visits to the Regional Science Centre.
- (iv) Expand consultancy activities to broaden departmental reach.
- (v) Support students in transitioning back to the classroom environment and actively involve them in the teaching and learning process following post-COVID trauma.

13. Best Practices of the department

- (i) Conducting regular student seminars
- (ii) Closely monitoring students and rewarding marks for tests, attendance, assignments, and performance in practicals.
- (iii) Encouraging projects leading to fabrication of devices and working models
- (iv) Consultancy activity using SIL initiated.
- (v) Identifying the students and making them participate in different competitions. like seminar competitions, and poster presentations.
- (vi) Giving exposure to the students through the different activities run by the Physics Society.

14. SWOC Analysis

S-The department fosters a conducive atmosphere, promoting openness for various activities. It boasts excellent infrastructure and is supported by a team of highly qualified staff. The presence of a sophisticated Instrumentation Laboratory enhances practical learning experiences. Additionally, the Physics Society serves as a platform for all stakeholders to engage and collaborate effectively. Faculty members have collectively developed an e-resource, further enriching the educational environment. The department's student-centric approach underscores its commitment to nurturing the academic growth and success of its students.

W- Securing placements in Physics beyond the teaching domain can be challenging due to limited connections with industry and the absence of research projects.

O-Utilizing the Sophisticated Instrumentation Laboratory for research and consultancy purposes offers significant potential. Its diverse applications across various fields can capture the interest of both students and teachers alike. Additionally, being designated as 2(f) and 12(B) opens avenues for securing research grants.

C-In a post-COVID scenario, attracting students to engage in learning poses a challenge due to decreased interest.

Date:19-3-2024

Head of the Department

Additional Information

S W Anwane is Co-opted on Board of Studies as a member for **Applied Sciences and Humanities (0119)** under the **Faculty of Science and Technology** under category 40(2)(a) by RTM Nagpur University, Nagpur.

Note: Category 40(2)(a)- Head of the department who is recognized for imparting teaching to postgraduate students in an affiliated college or a recognized institution having post graduate teaching in that subject. RTMNU Notification No: Acad./BOS-Co-op/2399(A) dated 18 March 2023.

S W Anwane worked as *Chief Supervisor* at Center No 100 Shri Shivaji Science College, Nagpur for Summer 2023 RTMNU Examination (22-05-2023 to 14-08-2023).

YouTube Channel- a way to reach students at large

S W Anwane:

The You Tube channel <http://bit.ly/37UDXoq> offers about 116 Video Lectures on a variety of topics in Undergraduate Physics. The major playlists are as following:

- Band Theory & Semiconductors [UG Level, 04 Lectures 4.5 hrs]
- Simple Harmonic Motion [UG Level, 3.5 Lectures 6 hrs]
- Complex Numbers [PG Level, 23 Lectures 16 hrs]
- Differential Equations using Maple [Invited Talk in FDP-2020 Webinar, 1.5 hr]
- Black Holes & Complementarity [Invited Talk in National Conference, 1 hr]
- Special Relativity using Perplex Numbers [Research Level, 5 Lectures 1.5 hrs]
- Quantum Mechanics [UG Level, 11 Lectures, 4 hrs]
- Fluid Mechanics [UG Level Engg, 10 Lectures, 5.5 hrs]
- Gravitation [UG Level, 6 Lectures, 2.5 hrs]
- Quantum Mechanics [UG Level, 11 Lectures, 4 hrs]
- Statistical Mechanics [UG Level, 5 Lectures, 5.5 hrs]
- Time Varying Fields [UG Level, 13 Lectures, 4 hrs]
- Electrostatics & Dielectrics [UG Level, 3 Lectures, 3 hrs]
- MAPLE [Cert Course, 7 Lectures, 3.75 hrs]
- Introduction to Black Holes [UG Level, 2 Lectures, 0.5 hr]
- Crystallography [UG Level, 3 Lectures, 0.75 hr]

G L Jadhav:

- Interference of Light (1) <https://youtu.be/XmX12S57pBk>
- Interference of Light (2) <https://youtu.be/VjtYhjoNg3E>
- Interference of Light (3) <https://youtu.be/oyRZTBSNpmY>
- Interference of Light (4) https://youtu.be/_uMFS056ypA

- Interference of Light (5) <https://youtu.be/gDHd-CS2IAA>
- Interference of Light (6) <https://youtu.be/hZ-QmhhVnO4>
- Interference of Light (7) https://youtu.be/yAhzGDD_dC4
- Field Effect Transistor (1) <https://youtu.be/fdhh9aURsRM>
- Field Effect Transistor (2) <https://youtu.be/bzOmac2yivo>
- Field Effect Transistor (3) <https://youtu.be/afhYEGTCpLM>
- Polarization of Light <https://youtu.be/QuTH33peSuo>

Dr. Sugandha V. Khangar (Wagh) -

- Links of YouTube lecture and LMS are given below:
- LMS link for B. Sc. SEM-I & SEM-II: <https://class.ssesa.live/b/mah-0xa-bit-n1p>
- LMS link for B. Sc. SEM-III & SEM-IV: <https://class.ssesa.live/b/mah-skk-vvr>
- B.Sc. SEM-II Laws of thermodynamics – Carnot’s cycle You Tube link: <https://www.youtube.com/watch?v=Elix1XVKU80&t=233s>
- B.Sc. SEM-III “Atmosphere and Geophysics” YouTube links:
- <https://www.youtube.com/watch?v=IS1Emq5lveo&t=45s>
- https://www.youtube.com/watch?v=SEYc5l3ZE_g&t=1s
- https://www.youtube.com/watch?v=_5CqpVONfVQ&t=54s
- <https://www.youtube.com/watch?v=BHD7JqG8swU&t=55s>
- <https://www.youtube.com/watch?v=G6sSF1SAVCc&t=5s>
- <https://www.youtube.com/watch?v=OHj1IcO5MMc&t=50s>
- <https://www.youtube.com/watch?v=lyVM1lrP1Xs&t=451s>
- <https://www.youtube.com/watch?v=pUeBi2MZ0MY>
- <https://www.youtube.com/watch?v=0cuUZ7M1Wtw&t=19s>
- <https://www.youtube.com/watch?v=fiqw3c7D80o>
- B.Sc. SEM-IV “LASER and OPTICAL FIBER” YouTube links:
- <https://www.youtube.com/watch?v=rk79l8ykQyw&t=119s>
- <https://www.youtube.com/watch?v=xLmjAZUsGt8&t=32s>
- B. Sc. SEM-I Experiments YouTube links
- Modulus of Rigidity:
- <https://www.youtube.com/watch?v=qqaerRKcEYg&t=9s>
- Moment of Inertia of fly wheel: <https://www.youtube.com/watch?v=RbZr85SkjOs&t=334s>
- Study of Phase shift oscillator

Dr. S K Sayyad -

- FTIR : <https://youtu.be/GOha8uVvoVg>
- Hydrothermal method: <https://youtu.be/e-Fv94L7gYU>