

1. Name of the department:

Physics

2. Year of Establishment:

1963

3. Names of programmes/ courses offered:

UG (Elective: Electronic Instrumentation)

4. Names of Interdisciplinary courses and the departments/ units involved:

Nil

5. Annual/ semester/ choice based credit system (programme wise):

Credit Based Semester System

6. Participation of the department in the courses offered by other departments:

Nil

7. Courses in collaboration with other universities, industries, foreign institutions, etc.:

Nil

8. Details of courses/programmes discontinued (if any) with reasons:

Nil

9. Number of teaching posts:

Post	Sanctioned (17) Filled (16)	Details
Professors	-	
Associate Professors	10	
Assistant Professors	06	

10. Faculty profile with name, qualification, designation, specialization, (D.Sc./ D.Litt. /Ph.D./ M. Phil. etc.):

Name	Qualification	Designation	Specialization	Experience (Years)	No. of Ph.D. students guided in last 4 years
Raghu Pillai	M.Sc., M.Phil.	Associate Professor	Electronics	32	-
P.N. Anchalia	M.Sc.	Associate Professor	Electronics	30	-
Dr. Subhaga Karlekar	M.Sc., D.H.E, Ph.D.	Associate Professor	Electronics	35	01 M.Phil. student
R.P. Ghorapade	M.Sc.	Associate Professor	Nuclear Physics	29	-
M.S. Oka	M.Sc., M.Phil.	Associate Professor	Electronics	28	-
M.R. Dole	M.Sc.	Associate Professor	Electronics	27	-
M.M. Oka	M.Sc., M.Phil.	Associate Professor	Solid State Electronics	27	-
R.U. Jadhav	M.Sc.	Associate Professor	Nuclear Physics	27	-
G. Mathur	M.Sc., M.Phil.	Associate Professor	Solid State Electronics	30	-
S. Maratt	M.Sc.	Associate Professor	Electronics	25	-
A. Bajaj	M.Sc.	Assistant Professor	Electronics	24	-
Devraj Pawar	M.Sc., SET	Assistant Professor	Nuclear Physics	09	-
Dr. Kiran Kolwankar	M.Sc., Ph.D., NET	Assistant Professor	Non Linear Dynamics	07	-
Sandeep Hinge	M.Sc., SET	Assistant Professor	Nuclear Physics	05	-
Dr. N.B. Srivastava	M.Sc., Ph.D.	Assistant Professor	Solid State Physics	20	-
Vaishali Raikwar	M.Sc., B.Ed., NET	Assistant Professor	Electronics	1	-

11. List of senior visiting faculty/Guest:

Nil

- 14 Lab Attendants
- 02 Peon

12. Percentage of lectures delivered and practical classes handled (programme wise) by temporary faculty:

Nil

15. Qualifications of teaching faculty with DSc/ D.Litt/ Ph.D/ M.Phil./ P.G.:

Ph.D.: 3
M.Phil.: 05
M.Sc.: 8

13. Student-Teacher Ratio (programme wise):

45:1

14. Number of academic support staff (technical) and administrative staff sanctioned:

- 03 Lab Assistants

16. Number of faculty with ongoing projects from a) National b) International funding agencies and grants received:

"Functioning of IQAC" in collaboration with Bhandodkar College, Thane. Funded by UGC.

Dr. N.B. Shrivastava

To Investigate the nature of charge carriers and the mechanism of transport in conducting carbon nanotubes (2012-2014) (Rs. 1,00,000) Funded by UGC

17. Departmental projects funded by DST-FIST; UGC, DBT, ICSSR, etc. and total grants received:

Dr. Devraj Pawar:

- Self-organized critical Phenomena on Fractals (2009-2011) (Rs. 80,000) Funded by UGC
- Timing and spectral Properties of Neutron stars (2010-2011) (Rs. 15,000) Funded by University of Mumbai

Dr. Kiran Kolwankar

- Phase Transition in Non equilibrium statistical Models (2008-2011) (Rs. 70,000) Funded by UGC
- Studies of Patterns and Synchronization in Neuronal Networks using coupled Nonlinear Oscillators (2008-2011) (Rs. 12,30,000) Funded by DST

18. Research centre/ facility recognized by the University:

Nil

19. Publications:

(Publication per faculty)

Number of papers published in peer reviewed journals (national/ international) by faculty and students

Devraj Pawar

- "The hard state of black hole candidate: XTE J1752-223", Journal of the Monthly Notices of the Royal Astronomical Society, March 2010.
- "Discovery of twin kHz quasi-periodic oscillations in the low-mass X-ray binary XTE J1701-407", Journal of the Monthly Notices of the Royal Astronomical Society, June 2013.

Dr. Kiran Kolwankar

- J Jost and KM Kolwankar (2009). Evolution of network structure by temporal learning. Physica A Vol. 338, PP 1959.
- Q Ren, KM Kolwankar, A Samal and J Jost (2010). Network motifs in STDP driven neuronal networks In Proceedings of 18th IEEE workshop on non linear dynamics of electronic systems Dresden.
- Q Ren, KM Kolwankar, A Samal and J Jost (2010). STDP driven networks and the C.elegans neuronal network. Physica A Vol. 389, pg. 3900.
- KM Kolwankar, Q Ren, A Samal and J Jost (2011). Learning and structure of neuronal networks Pramana-J. Phys. Vol.77, pg. 817
- H Basu, KM Kolwankar, AK Dharmadhikari, JA

Dharmadhikari, K Bambardekar, S Sharma and D Mathur (2012). Laser driven accelerated growth of dendritic patterns. J Phys.Chem. C. Vol 116 pg. 11480

• Q Ren, KM Kolwankar, A Samal and J Jost (2012). Hopf bifurcation in the evolution of STDP- driven networks Phys. Rev.E., Vol. 86 pg 056103.

Dr. N.B. Srivastava

- NB Srivastava, LN Singh and CM Srivastava (2009). "Correlated polaron transport and metal insulator transition in $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ " Journal Appl.Phys. 105,07D704.
- CM Srivastava, NB Srivastava and D Bahadur (2009). "Small polaron transport and colossal magnetoresistance in $\text{La}_{2/3}\text{Ca}_{1/3}\text{MnO}_3$ " Jour.Appl. Phys. 105, 093908.
- CM Srivastava and NB Srivastava (2008). Origin of magnetoresistance in $\text{La}_{2/3}\text{Ca}_{1/3}\text{MnO}_3$ Thin film and bulk material " Proc. The 10th International Conference on Ferrites Chengdu China pp 35-37.
- NB Srivastava, LN Singh and CM Srivastava (2009) Role of Zero ooint vibration on transport and magnetic ordering presented at Indo U S Workshop on Advance magnetic materials and their Applications Jointly organized by IIT India and North Eastern University, Boston, USA, March 1-4, 2009 .
- NB Srivastava, D Bahadur and CM Srivastava (2013 accepted). Magnetic polaron in Dilute Ferromagnetic oxide films and nanoparticles. Journal of the Japan society of Powder and Powder metallurgy.

Vaishali Raikwar

- Vaishali R R (2012). Combustion synthesis of UV Emitting Mn^{2+} Doped Nano-crystalline calcium borate. International refereed Journal of Engineering and Science ISSN (online) 2319-183X, 2319-1821, vol 1(3), pp. 34-38.
- Combustion synthesis and luminescence properties of Europium doped strontium aluminate phosphor. Proceedings of the 4th International conference on Luminescence and its Applications, February 7-10th February, 2012.
- Synthesis and luminescent properties of $\text{Y}_2\text{SiO}_5:\text{Ce}^{3+}$, Tb^{3+} phosphor. Proceedings of National conference on Lasers and Advanced Materials 29-30 May, Amravati University, Amravati (2012).
- Combustion synthesis and photoluminescence in nano crystalline pyrosilicate doped with rare earths. Proceedings of National conference on Luminescence and its applications held at NES Institute of Technology, Bangalore 8-10, January 2013.

20. Areas of consultancy and income generated:

- Dr. Subhaga Karlekar worked as certified examiner

for IMC's RBNQA for the year 2009, 2010 and 2011.

Amount: Rs. 50,000.

- Dr. Kiran Kolwankar worked as a resource person at ICT workshop. Amount: Rs. 48,000.

21. Faculty as members in

Senate: Nil

Board of Studies: 01

22. Student projects

a. Percentage of students who have done in-house projects including inter departmental/ programme:

Nil

b. Percentage of students placed for projects in organizations outside the institution i.e.in Research laboratories/ industry/ other agencies:

Nil

23. Awards/ Recognitions received by faculty and students:

Nil

24. List of eminent academicians and scientists/ visitors to the department:

Name	Institute	Year
Dr. Kishore Marathe	City University of New York Brooklyn College.	2010
Dr. Punit Paramanand	Dept. of Physics, IIT Mumbai	2010
Dr. Aaditya Dharmadhikari	TIFR	2011
Dr. Janaky Narayan	IIT Mumbai	2011
Dr. Radha Srinivasan	University of Mumbai	2011
Dr. Shymal Dana	Indian Institute of Chemical Biology, Kolkata	2011
Dr. Anirban Sain	Dept. of Physics, IIT Mumbai	2012
Dr. Jahangir Mistry	Xavier Institute of Communication	2012

25. Seminars/ conferences/ workshops organized & the source of funding:

- Workshop on revised syllabus in Physics was organized on 11/7/2009 under the aegis of BOS University of Mumbai.

26. Student profile programme/ course wise:

Year	Applications received	Selected	Enrolled		Pass percentage
			M	F	
<i>T.Y. B.Sc.</i>					
2012-13	63	63	40	23	56.9%
2011-12	42	42	31	11	43.2%
2010-11	43	43	33	10	70.7%
2009-10	67	67	44	23	83%

27. Diversity of Students:

Name of the Course	% of students from the same state	% of students from other states	% of students from abroad
F.Y. B.Sc	95	5	-
S.Y. B.Sc	100	-	-
T.Y. B.Sc	100	-	-

28. How many students have cleared national and state competitive examinations such as NET, SLET, GATE, Civil services, Defense services etc.?

Data not available

29. Student progression:

Student progression	Against % enrolled
UG to PG	20%
PG to M.Phil.	Data not available
PG to Ph.D.	Data not available
Ph.D. to Post-Doctoral	Data not available
Employed	100%
• Campus selection	
• Other than campus recruitment	
Entrepreneurship/ Self-employment	Data not available

30. Details of Infrastructural facilities:

- Library: 3858 Books (+ books in central library)
- Internet facilities for Staff & Students: Available
- Class rooms with ICT facility: Available
- Laboratories: 4

31. Number of students receiving financial assistance from college, university, government or other agencies:

Annexure IX (pg. 264)

32. Details on student enrichment programmes (special lectures/ workshops/ seminar) with external experts:

- Summer Course for better understanding of the concepts of physics for S.Y. B.Sc. students is being conducted every year.
- Basic Course in physics for F.Y. B.Sc. students was also conducted to clear the basics of physics.
- Study circle and Wall paper involves students in group activities
- Space Point Club of the department holds many night sky observations every year. It also conducts special sessions of sky observations during the eclipse. Various guest lectures are organized to arouse and satisfy the interest of the students in astronomy and astrophysics.
- T.Y. B.Sc. students were taken for a visit to TIFR on 29 July 2011.
- Organised a Mobile Planetarium on 15 Jan 2013 for our students and also for school children
- Department provides a handbook to the students

which they can use as a practical textbook. The handbook gives circuit diagram, ray diagram, procedure, and theory for each experiment. In addition to this observation table calculations, graphs, formulae etc. are also given in this booklet for each experiment. This makes things easier for the students. At the time of exam they can use this booklet as a study material to prepare themselves.

33. Teaching methods adopted to improve student learning:

- Use of Models, Powerpoint Presentations, films on various topics of physics, group discussions and students seminars are some of the methods adopted to improve the student ability to grasp the principles of physics

34. Participation in Institutional Social Responsibility (ISR) and Extension activities:

- One faculty member is NSS Programme Officer for the last four years is from Physics department and one of the faculty members is in the committee for extension activities of the college. They organize most of the community based activities in the college.

35. SWOC analysis of the department and future plans:

• Strengths:

Physics Department is one of the largest departments (16 faculty members) in the University of Mumbai. The department has dedicated and committed faculty always interacting through discussions and laboratory sessions to set up a student friendly academic environment. The non-teaching faculty members of the department are very co-operative in all respect. Ever ready to do the modifications required in the laboratory equipment when the change in syllabus or exam pattern requires, maintaining the laboratory equipment in good working condition. The laboratories are well equipped and well maintained. Research room is made available for teachers to encourage them to take up minor or major research projects.

• Weakness:

Space constraints limit the implementation of certain programs at certain times.

• Opportunities:

With three staff members having a Doctorate and 2 members being registered for Ph.D. there is ample scope for extending research projects for teachers as well as students. Teaching and learning methods can be improved further with more and more availability of e-learning resources.

• Challenges:

With courses like Biotechnology, Computer Science, IT and large number of students opting for Engineering, the demand for basic science is diminishing. The biggest challenge for a subject like physics is to attract students by projecting opportunities in basic science, and by stressing that basic science serves as base for many applied courses. To train under performers and make them perform better.

• Future Plans:

To train students to master the basics of the subject and improve their soft skills through several interactive sessions both in theory and practicals.

To motivate teachers to guide undergraduate students for research projects.