

# Evaluative Report of the Department of Physics

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1. Name of the Department – Physics
2. Year of Establishment – 1958
3. Is the Department part of the faculty of the university? – Yes
4. Names of Programs offered (UG, PG, M.Phil, Ph.D. Integrated Masters, Integrated Ph.D. D.Sc. D.Lit. etc) – M.Sc., M.Phil., Ph.D, D.Sc.
5. Interdisciplinary programmes and departments involved – None
6. Courses in collaboration with other universities, industries, foreign, institutions, etc. – No
7. Details of programme discontinued, if any, with reasons – No
8. Examination System – Semester
9. Participation of the department in the courses offered by other departments – Yes
10. No. of teaching posts sanctioned, filled and actual.

	Sanctioned	Filled	Actual (CAS & MPS)
Professor	2	0	1 CAS
Associate Professor	8	0	5 CAS
Asst. Professor	6	0	1 MPS
Others	0	0	0

## 11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D.	No. of M.Phil.	No. of D.Sc
Prof (Dr.) Satyendra Narayan Singh	Ph. D.	Professor	Mathematical Physics, Nanostructures, Materials Science	34	5	4	0
Dr. Arun Kumar	Ph. D.	Assoc. Professor	Electronics	34	1	10	0

Dr. Jayanty Ashok (Rtd.)	M.Sc, Ph.D, L.L.B, PG Diploma (Human Rights)	Assoc. Professor	X-Ray Crystallography (Solid State Physics)	41	1	4	0
Dr. (Mrs.) Sudha Singh	M.Sc, Ph.D.	Assoc. Professor	Theory of Nuclear and Particle Physics, Quantum Optics	34	2	4	0
Dr. Sanjay Kumar Dey	M.Sc, Ph.D.	Assoc. Professor	Theoretical Work in Nanostructures/Quantum hetero-structures.	34	0	4	0
Dr. Achint Kapoor	M.Sc, Ph.D.	Assoc. Professor	Theoretical Optical Waveguide	34	1	4	0
Sri Arun Kumar	M.Sc	Asst. Professor	Solid state physics	14	0	4	0
Dr. Ajay Prakash Saha (Rtd)	M.Sc, Ph.D	Assoc. Professor	Solid State Physics	41	0	0	0

**12. List of senior visiting fellows, adjunct faculty, emeritus professors**

– None

**13. Percentage of classes taken by temporary faculty**

– 15% by Guest Faculty in Computer Application Paper and 80% in Electronics and Communication

**14. Programme-wise student Teacher Ratio.**

Course	Student	Teacher
M.Sc.	20	1
M.Phil.	2	1
Ph.D.	2	1

**15. No. of Academic support staff & administrative staff.**

Non Teaching Staff	Sanctioned	Filled	Actual
Support Staff (Technical)	5 Class III Staff	1	1
Administrative Staff	13 Class IV staff	5	5

16. **Research thrust areas as recognized by major funding agencies** – Theoretical Physics and Electronics
17. **Number of faculty with ongoing projects from (a) National (b) International funding agencies & (c) Total grant received. Give the name of funding agencies, project title & grants received project wise.**
- (a) **No. of faculty with ongoing projects funded by national funding agency** – 1
- (b) **No. of faculty with ongoing projects funded by international funding agency** – None
- (c) **Name of the projects** – Not applicable
- (d) **Total grants received** – Not applicable
- (e) **Name of the funding agency** – Not applicable
18. **Inter-institutional collaborative projects & associated grants received**
- (a) **National Inter-Institutional Collaborative Projects** – None
- (b) **National Inter-Institutional Collaborative Project's Grants Received** – None
- (c) **International Inter-Institutional Collaborative Projects** – None
- (d) **International Inter-Institutional Collaborative Project's Grants Received** – None
19. **Department projects funded by DST-FIST, UGC-SAP/CAS, DPE, DBT, ICSSR, AICTE, etc; total grants received**
- (a) **Departments Project Funded by** – None
- (b) **Total Grants Received** – None
20. **Research facility center with**
- (a) **Research Facility with State Recognition** – Central Instrumentation Facility of the University is under development, which is located in the University Department of Physics, named as ASTRC, RU, Ranchi

(b) **Research Facility with National Recognition** – None

(c) **Research Facility with International Recognition** – None

21. **Special research laboratories sponsored by/ created by industry or corporate bodies** – None

## 22. Publications

Name	No. of papers: National	No. of papers: International	Monographs	Chapters in Books	Edited Books	Books	Awards
Prof (Dr.) Satyendra Narayan Singh	2	8	1 under preparation	0	0	0	0
Dr. Arun Kumar	7	3	0	0	0	3	0
Dr. (Mrs.) Sudha Singh	2	9	0	1	0	0	0
Dr. Sanjay Kumar Dey	3	2	0	0	0	0	0
Dr. Achint Kapoor	3	2	0	0	0	0	0
Sri Arun Kumar	1	0	0	0	0	0	0

Name	No. listed in International Database	Citation Index	SNIP	SJR	Impact Factor	h-index
Prof (Dr.) Satyendra Narayan Singh	0	30	0	12.86	0	2

The details for other faculty members are – not available

23. **Details of patents and income generated** – None

24. **Areas of consultancy and income generated** – None

25. **Faculty selected nationally/internationally to visit other laboratories/institutions/industries in India and abroad** – None

26. **Faculty serving in**

(a) **National committees** – None

(b) **International committees** – None

(c) **Editorial Boards** – None

(d) **any other (please specify)** – None

**27. Faculty recharging strategies (UGC, ASC, Refresher/orientation programs, workshops, training programs and similar programs).**

Name	No. of Orientation/Refresher Courses Attended in the Last 4 Years	No. of Lectures Delivered as Resource Person in ASC/Any other Institution in the Last 4 Years
Prof (Dr.) Satyendra Narayan Singh	01, as Co-ordinator of refresher course in Experimental Physics.	5
Dr. Arun Kumar	0	6
Dr. S.K. Dey	01 as Co-ordinator of Refresher course	2
Sri Arun Kumar	1 as Course Co-ordinator	0
Dr. (Mrs.) Sudha Singh	3	8
Dr. Ajay Prakash Saha (Rtd)	0	3

**28. Student Projects**

- (a) Percentage of students who have done in-house projects including inter departmental projects – 75%
- (b) Percentage of students doing projects in collaboration with other universities/ industries/institute – 25%

**29. Awards/recognitions received at the national international level by**

- (a) Faculty – None
- (b) Doctoral/post doctoral fellows – None
- (c) Students – None

**30. Seminar/Conferences/Workshops organized and the source of funding (national/international) with details of outstanding participants, if any.**

– None

**31. Code of ethics of research followed by the departments**

– As per guidelines of Ranchi University.

**32. Student profile programme-wise:**

Name of the Programme	Applications Received	Selected		Pass Percentage	
		Male	Female	Male	Female
M. Sc. Physics					
2011-13	90	27	29	90%	87%

2012-14	89	14	28	88%	80%
2013-15	199	11	41	90%	84%
2014-16	189	25	37	Ongoing	
2015-17	269	55	62	Ongoing	

**33. Diversity of students:**

Name of the Programme	% of Students from the same University	% of Students from other Universities within the State	% of Students from Universities Outside the State	% of Students from other Countries
M.Sc Physics	96	4	0	0
M.Phil	98	2	0	0

**34. How many students have cleared Civil Services and Defence Service examinations, NET, SET, GATE, and other competitive examinations? Give details category-wise.**

Examination	Numbers
Civil Services examinations	0
Defence Services examinations	0
NET	4
SET	0
GATE	0
Other Competitive Examinations	0

**35. Student Progression:**

Student Progression	% Against Enrolled
UG to PG	
PG to M.Phil	58
PG to Ph.D	5
Ph.D to Post-Doctoral	0
<b>Employed</b>	Available with the Placement Cell Ranchi University
• Campus Selection	
• other	

**36. Diversity of staff:**

Percentage of Faculty Who are Graduates	
of the same university	83
from the other universities within the state	0
from universities from other state	17
from universities outside the country	0

**37. No. of faculty who were awarded M.Phil, Ph.D., D.Sc., and D.Litt. during the assessment period**

- (a) M.Phil. – None  
 (b) Ph.D. – None  
 (c) D.Sc. – None  
 (d) D.Litt. – None

**38. Present details of departmental infrastructural facilities with regard to**

- (a) Library – More than 8000 books, more than 1000 (old and new) journals  
 (b) Internet facilities for staff and students – Available in Labs and also Wi-Fi facility  
 (c) Total number of class rooms – 5  
 (d) Class rooms with ICT facility – 3  
 (e) Student laboratories – 6  
 (f) Research laboratories – 1

**39. List of Doctoral, Post-doctoral students & Research Associates**

S. No.	Name of Supervisor	Name of Candidate	Title
1	Dr. J.N. Prasad	Kumari Mamta	Electromagnetic field estimation in some radiating structures
2	Dr. D.N. Mahato	R.N. Prasad	A study of structure property relation of non-ideal solids
3	Dr. A. Kapoor	Namita Singh	Symmetry breaking effects in some physical problems involving systems with cylindrical geometry
4	Dr. M.P. Jha	Sparkleen Dei	A theoretical study of Bose-Einstein condensation and superfluidity in liquid Helium 4
5	Dr. J.N. Prasad	S.P. Sinha	Use of remote sensing and GIS technology in geographical profiling of Sub-surface terrain for ground water quantification in selected areas of palamu district, Jharkhand, India
6	Dr. J.N. Prasad	Raj Kumar Singh	Study of domain wall dynamics driven by Spin polarized current in magnetic nanowires
7	Dr. B.N. Prasad	S.C. Das	Investigation of density varying medium problem related to the flow behind the propagating shock waves taking thermal radiation in to account
8	Dr. S.N. Singh	Mrs. Nusrat Ahmad	Synthesis and characterization of magnetite nanoparticles

9	Dr. J.N. Prasad	Nand Kumar Rana	Study of ferromagnetism in some semiconductor materials doped with transition metals
10	Dr. Sudha Singh	Ms. Amrita	Study of non-classical properties in two/multi photon Process with special reference to quantum entanglement
11	Dr. J. Ashok	Manoj Kumar Pandey	Studies on the measurements radiation quantities of high energy Photon and electron beams and their applications
12	Dr. S.N. Singh	Swarat Chaudhuri	Structural/Electrical characterization of perovskite nanoferroelectric ceramics synthesized by high energy ball milling
13	Dr. J.N. Prasad	Ms. Manju Kumari	Study of Coulomb effects on spin dependent transport in a semiconductor
14	Dr. N.R. Chakraborty	Manik Chandra Singh	Reflection and refraction of thermo elastic seismic waves under initial stress through layered solid-solid, soli-liquid and liquid-liquid interface in the interior of the earth
15	Dr. S.N. Singh	Bimal Kishore Choudhary	Synthesis and characterization of multiferroic composite materials
16	Dr. Arun Kumar	Rajeev Asthana	Improving the performance of active filters
17	Dr. J.N. Prasad	Pradip Kumar Mishra	Development and characterization of chalcozenide nanostructured material for device applications
18	Dr. N.R. Chakraborty	Asghar Khan	Optimization of design parameters of high efficiency holographic solar concentrators of Photo-voltaic power generation
19	Dr. V.S. Giri	Shailesh Kumar Sinha	Kinetic equation for the electrons interacting with long wavelength optical phonon in a spatially inhomogeneous medium
20	Dr. S.N. Singh and Dr. Sanjay Kumar	Saurabh Kumar	Modelling of solar radiation and temperature profile to predict global warming and heat island effect
21	Dr. S.K. Dey	Nilanjan Sil	Binding energy of impurity states in a cylindrical quantum dot
22	Dr. Manoj Kumar	Sayantana Sil	Analytical studies of some problem of MFD flows
23	Dr. S.N. Singh	Sumit Kumar Roy	Fabrication and characterization of some lead free perovskite ferroelectric ceramics
24	Dr. (Mrs.) Kum Kum Sinha	Kaushalesh Kumar	Study of thermo mechanical properties of magnesium aluminates spinal by addition of zirconia and its correlation with crystal symmetry
25	Dr. Sudha Singh	Karuna Gilhare	Study of non-classical properties in radiation-matter interaction

26	1. Dr. S.K. Sengupta 2. Dr. B. Prajapati	Y.N. Mahto	Development, characterization and application of electrically conducting and semiconducting polymers and fibres
27	Dr. A. Kapoor	Ganga Prasad Gupta	Investigation of symmetry breaking effects involving problems of dielectric waveguides with cylindrical geometry
28	Dr. Sudha Singh	Arun Kumar	Study of dynamical behaviour in the non-linear atoms fields interactions
29	Dr. Namita Singh	Roopam Sharma	Investigation of Physical Properties of Parent and Doped MgBe Superconductors
30	Dr. Sudha Singh	Ms. Payal Raina	High energy linear accelerator based IMRT and VMA studies for deposited energy ena
31	Dr. Manoj Kumar	Anupam Kumar	The investigation of spectral response of single mode fibre and photonic crystal fibre structure using interferometry for the potential application as sensor
32	Dr. B. Prajapati	Arvind Kumar	Development and Characterization of thin film using low-cost non-aqueous technique for solar cell
33	Prof. S. N. Singh	Rajesh Kumar	Study of electronic states in some low-dimensional structures

**40. No. of post graduate students getting financial assistance from the university**

1. 4 BPL students are given Rs 500/- each per month
2. MA topper is appointed as Teaching Assistant for one year & is given Rs 4000/- per month
3. PhD entrance test topper is also appointed as Teaching Assistant for two years and is given Rs 5000/- per month

**41. Was any need assessment exercise undertaken before the development of new programmes? if so, highlight the methodology**

– No

**42. Does the department obtain feedback from (a) faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?**

– The curriculum development and updation is done with Faculty consultation and communicated to the University for approval by Academic Council

- (b) **students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?** – There is a centralised feed back system, from which the feed back is filtered to the departmental council and necessary corrective measures are adapted.
- (c) **alumni and employers on the programmes offered and how does the department utilize the feedback?** – Department suggests curriculum development as per the need and suggestions of alumni/employer to the University

#### 43. List of Alumni

Name	Post
Dr. Amit Patro	Scientist ISRO, India
Dr. Sidharth Prasad	Associated with LHC Project ,Switzerland
Dr. Rabindra Kumar Mahto	Post Doc fellow Institute, Nanotechnology Netherlands Ph. D. from IIT, Kharagpur
Dr. Dilip Kumar Singh	Post Doc Fellow, Seol University, South Korea, Ph. D. from IIT, Guwahati
Dr. Sanat Banerjee	Post Doc Fellow Germany, Ph. D. from B.I.T., Mesra
Ms. Raffia Ahmad	Doctoral Fellow, I.I.Sc., Bengaluru
Mr. Himanshu Shekhar Jha	Ph. D., IITG
Dr. Kaushik Banerjee	BARC, Mumbai, VECC
Dr. Binay Kumar Singh	VECC, Scientific Officer
Ms. Satchi Singh	Ph. D., IITG
Ms. Spriha	Selected under Ph. D. Programme, IISER, Kolkata
Mr. Rohit Kumar	Ph. D. Indian School of Mines

#### 44. Give details of student enrichment programmes (special lectures/workshops/seminar) involving external experts

Name & Address	Sub. of Lecture	Date
Professor T. S. Pal, I. I. T. Karagpur, Synthesis and Characterization of Materials	On Nano Metal Oxides	18-19 May 2014
Professor N. K. Jaggi, University of Illinois, USA:	Oscillations in Chemical Reactions,	02-04 July 2014
Swetank Ambash:	On Robotics, Design and Applications, Demonstrations made	22/01/2015

**45. List the teaching methods adopted by the faculty for different programmes.**

- Black Board and Chalk
- PPT
- Smart Board

**46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?**

By regular monitoring of students' performance Bi-monthly tests; three Mid-semester examinations are conducted in each Semester

**47. Highlight the participation of students and faculty in extension activities.**

- Youth Festival
- Workshops
- Students encouraged to bring Physics to the masses so that the society orthodoxy may be removed

**48. Give details of "beyond syllabus scholarly activities" of the department**

- Participation of the students in different functions to bring out their intrinsic qualities

**49. State whether the programme/department is accredited/ graded by other agencies?**

If yes, give details.

– No

**50. Briefly highlight the contributions of the department in generating new knowledge, basic or applied.**

Students are contributing in Research, Education and other Fields after passing out from the Department is serving as a feeding centre of Research Scholars to IITs; large number of research scholars are working who are pass-out of this Dept. in IIT Kharagpur, IIT Guwahati, IIT Kanpur, etc.

**51. Detail five major Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.**

<b>Title</b>	<b>Description</b>
Strength	More than 50% of the students, taking all programs in to account, are female students; thus the Dept. fulfills an important responsibility associated with the national programme of women empowerment
Strength	The participation of ST, SC and OBC students is high in all the programs; the three categories together account for more than 70% of the total intake
Strength	The fees charged is low as compared to fees charged by other Universities/ Institutions
Strength	Provisions have been made to provide free education and a scholarship to BPL category students; four in each program since this session (2014-15)
Strength	There is a very good response from the students for admission in the programs; 191 admission forms had been submitted for admission to 50 seats for 2013-2015 session and 189 applications have been received for admission to M. Sc. course in the current session, 2014-2015
Weaknesses	An acute shortage of Faculties hampering the quality of education; currently the Dept. has only 50% of the sanctioned strength
Weaknesses	Insufficient non-teaching trained and supporting staff
Weaknesses	Insufficient number of laboratory equipments in view of increased intake over the past few years
Weaknesses	There is no modern ICT laboratory as the Computers installed are quite old and needs up gradation in view of rapid change in the hardware profile of computers
Weaknesses	Insufficient copies of popular text books and reference books in the Library
Weaknesses	Only one journal is subscribed by the Department due to lack of funds
Challenges	Enough scope to serve the needs of higher education of the students of lower income group, particularly those belonging to SC, ST and OBC categories
Challenges	To prevent the migration of students by providing quality education and better facilities at the local level
Challenges	Spreading of skill oriented education to the students, particularly women students
Challenges	Skill development for better employability to make the students competitive
Opportunities	Possibility of a quality improvement if sufficient number of teaching and non-teaching staff.
Opportunities	Training of staff, both teaching and non-teaching , will enhance quality
Opportunities	If increased employment avenues the drop out rate will decrease.
Opportunities	Prevention of migration of students to other regions for better avenues.

## **52. Future plans of the department.**

- To start research facilities in material science including Nanomaterials, we have already framed the syllabus under the CBCS and some initial equipments have been procured.
- To start One year PG Diploma Course in Computing and Data Analysis, proposal is being prepared