

EVALUATIVE REPORT OF THE DEPARTMENT OF PHYSICS

1. Name of the Department **Physics**
2. Year of establishment **1971**
3. Is the Department part of a School/Faculty of the university? **Yes,(Faculty of Natural Science)**
4. Names of Programmes/ Courses offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., etc.)

S. No.	Name of the Programme	Type of the Programme	Annual Intake
1	B.Sc. (Hons)	Regular, Full Time	40
2	M.Sc.	Regular, Full Time	40
3	Ph.D.	Regular, Full Time	-

5. Interdisciplinary courses and departments involved

S. No.	Name of the Programme	Multidisciplinary : Departments involved
1	B.Sc. (Instrumentation)	Physics, Mathematics, Mech, Engg. , Electrical Engg., Electronics Engg.
2	M. Tech. (Nanotechnology) (2007-2012)	Physics, Chemistry, Mathematics, Electronics

6. Courses in collaboration with other universities, industries, foreign institutions, etc.
Department is providing laboratory facilities B.Sc.(Physics) course conducted by IGNOU.

7. Details of programmes / courses discontinued, if any, with reasons

M.Tech. (Nanotechnology):

The Department started a self-financing course, M. Tech. in Nanotechnology, in the year 2007 in tune with the rising demand of strengthening research in nanotechnology as well as its commercial utility. From the session 2012-13, this course is transferred to the newly created Centre for Nanoscience and Nanotechnology, which has been an offshoot of the research being carried out in the area of Nanotechnology.

8. Annual/ Semester/Choice Based Credit System

Annual System (Old)

Semester System

S. No	Name of the Programme	Specialization	Examination System
1.	B.Sc. (H)	Physics	Annual system (till 2012) Semester System since 2012
2.	M.Sc. Physics	(a) Materials Science, (b) Lasers & spectroscopy (c) Theoretical Physics	Annual system (till 2010) Semester System since 2010
3.	Ph. D.	Physics	-

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9. Participation of the department in the courses offered by other departments

S. No	Name of the Programme	Remarks
1.	M.Tech.(Nanotechnology)	From 2012 onwards
2.	B. Sc. (Hons.) Chemistry	Physics as a Subsidiary subject
3.	B. Sc. (Hons.) Maths	Physics as a Subsidiary subject
4.	B. Sc. (Pass)	Physics as a one of the subjects

10. Number of teaching posts sanctioned and filled (Professors/Associate Professors/Asst. Professors)

S. No.	Post	Sanctioned	Filled	Actual Positions (Including CAS/MPS)
1.	Professor	2	2	4+2+1
2.	Associate Professors	4 [#]	2+1*	1
3.	Asst. Professors	15	14	11

* One post deputed to CTP temporarily #vacant

11. Faculty profile with name, qualification, designation and specialization (D.Sc./D.Litt./ Ph.D./M.Phil., etc.)(2007-2014) (Awarded & Submitted)

S. No.	Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D. students guided for the last 5 years		No. of M.Tech students guided for the last 5 years
						Awarded	Under Supervision	
1	M. Zulfequar	Ph.D.	Professor	Materials Science	24 years	16	9	04
2	Zahid Husain Khan	Ph.D	Professor	Laser & Spectroscopy	39 years	07	6	
3	Pankaj Sharan	Ph.D	Professor	Theoretical Physics	35 years	Nil	Nil	
4	Syed Sajjad Mehdi	Ph.D	Professor	Theoretical Nuclear Physics	36 years	02	02	
5	M. A. Wahab	Ph.D.	Professor	Solid State Physics/Material Science	30 years	08	08	
6	Mushahid	Ph.D.	Professor	Materials	30	19	12	10

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	Husain		r	Science	years			
7	Saeeduddin	Ph.D	Professo r	Theoretical High Energy Physics	20 years	04	04	
8	Lekha Nair	Ph.D	Associat e Professo r	Surface Physics	18 years	01	01	1
9	Anver Aziz	Ph.D	Assistan t Professo r	Condensed Matter Physics	9 years	Nil	Nil	
10	Arun Singh	Ph.D	Assistan t Professo r	Materials Science	7 years#	Nil	Nil	
11	AsadNiazi	Ph.D	Assistan t Professo r	Experiment al Condensed Matter Physics	13 years	Nil	01	
12	Aurangzeb Khurram Hafiz	Ph.D	Assistan t Professo r	Quantum Optics	6 years	02	02	02
13	Azher Majid Siddiqui	Ph.D	Assistan t Professo r	Materials Science	12 years	02	0	03
14	Mohammed Ahsanul Hoda Ahsan	Ph.D	Assistan t Professo r	Theoretical Condensed Matter Physics	14 years	2	1	
15	Mohammad Shahid Khan	Ph.D	Assistan t Professo r	Laser & Spectrosco py	10 years	02	02	03
16	Syed Rashid Ahmad	Ph.D	Assistan t Professo	Theoretical Condensed Matter	4 years	Nil	Nil	

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			r	Physics				
17	Pumlianmunga	M.Sc.	Assistant Professor	Condensed Matter Physics	3 years	Nil	Nil	
18	SharfAlam	Ph.D	Assistant Professor	Particle Physics	20 years	1	1	
19	Somasri Sen	Ph.D	Assistant Professor	Astrophysics	13 years	Nil	Nil	

12. List of senior Visiting Fellows, faculty, adjunct faculty, emeritus professors

S. No.	Name	Position	Area of Specialization	Duration
1	Dr B.S. Patel, Ex. Dy. Director LASTECH (DRDO), New Delhi	Project Consultant in DRDO sponsored project	Lasers	2006-2009
2	Dr. Harsh, Ex. Dy. Director, SSPL, New Delhi	Project Consultant in DIT sponsored project	Nanotechnology	2010-2013
3	Prof. A. A. Al Ghamdi, Department of Physics, King Abdul Aziz University, Jeddah, Kingdom of Saudi Arabia	Visiting Fellow	Material Science	2011-onwards

13. Percentage of classes taken by temporary faculty – programme-wise information

S. No.	Program	Name of Temporary Faculty	Remarks
1.	B.Sc./M. Sc. Classes	Dr. Darakhshan Qaiser	5% (2012-2013)

14. Programme-wise Student Teacher Ratio

$245/18 = 13.61: 1$ *(In the Department of Physics)*

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

S.No.	Post	Sanctioned	Filled	Actual
1	Stenographer	1	1	1
2	Computer Operator	2	2	2
3	Technician	1	1	1
4	Mechanic	1	1	1
5	Sr. Lab. Asstt.	2	2	2

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6	Jr. Lab. Asstt.	3	3	3
7	Lab. Attendant	3	1	1+2*=3
8	Farrash	1	1	1
9	Peon	1	0	0

* Contractual

16. Research thrust areas recognized by funding agencies

- i. Theoretical and Experimental Condensed Matter Physics
- ii. Theoretical Nuclear and High Energy Physics
- iii. Molecular and Laser Spectroscopy

17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies and grants received project-wise.

S. No.	Principal Investigator	Title of Project	Amount Sanctioned (Rs. Lakhs)	Funding Agency	Duration
1	Prof. Mushahid Husain & Prof. M. Zulfequar	Growth of Single-Walled Carbon Nanotubes for Semiconducting Applications	380.761	DIT	2010-2015
2	Prof. Saeed Uddin	A Study of multi-particle Production Phenomenon in Ultra-relativistic nucleus-nucleus collision	6.32	UGC	2009-2012
3	Dr. Mohd. Shahid Khan	Detection of Toxic and Explosive Traces Using Cavity Ring Down Laser Spectroscopy (CRDS)	14.92	DRDO	2010-2013
4	Dr. Azher M. Siddiqui	Synthesis and Characterization of Transition Metal Doped Spinel Compounds	11.88	UGC	2011-2014
5	Dr. Arun Singh	Fabrication of piezoelectric and pyroelectric ceramics and thin films for transducers application Development and characterization of ferroelectric thin films and ceramics for device applications	19.44 10.70	DST UGC	2009-2012 2009-2012
6	Dr. M. A. H. Ahsan	Understanding the role of correlation in high temperature cuprate superconductors: An extended dynamical mean field study on model Hamiltonians.	12.5	UGC	2012-2015

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7	Dr. Somasri Sen	In search of modified theories of gravity	14.3	DST	2011-2014
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18. Inter-institutional collaborative projects and grants received

a) All India collaboration

S. No.	Name of Faculty Member	Nature of Collaboration	Collaborative Project	Name of Funding agency	Grants received
1	Prof. M. Zulfequar	National	Effect of Swift Heavy Ion irradiation on conjugated polymers	Nuclear Science Center, New Delhi	Rs.2.25 Lakhs (2005-2009)
2	Prof. M. Zulfequar	National	Design and Fabrication of Photon-Drag Detectors and Transversely Excited Carbon-dioxide Laser for their Evaluation	DRDO/LASTE C, New Delhi	Rs.37.31 Lakhs (2006-2009)
3	Prof. Saeeduddin	National	a) Search for the Dark Matter - WIMP	DST, DAE	To be received
4	Prof. Saeeduddin	International	a) Compressed Baryonic Matter – FAIR, Germany	DST	To be received
5	Dr. Lekha Nair	National	Development of UHV Surface Analysis system on the Low Energy Ion Beam Facility at the Inter University Accelerator Centre, New Delhi	Inter University Accelerator Centre, New Delhi	Infrastructural support, minor equipment, and expertise provided. 12 lakhs (COSIST) 5 lakhs (FIST) 2 lakhs (Plan funds)

19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, etc.; total grants received.

Project	Duration	Funding Agency	Funds received (Rs.)
DRS Phase I	1994-1999	UGC (SAP Scheme)	35.00 Lakhs
DRS Phase II	2000-2005	UGC (SAP Scheme)	40.25 Lakhs
DRS Phase III	2006-2011	UGC (SAP Scheme)	33.00 Lakhs

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Infrastructural Grant	2008-2010	UGC (SAP Scheme)	40.00 Lakhs
COSIST	2002-2007	UGC	67.5 Lakhs
FIST	2004-2009	DST	67.0 Lakhs
DSA Phase-I	2013-2017	UGC	96.0 Lakhs
		TOTAL GRANT	390.75 Lakhs

20. Research facility / centre with

- state recognition Nil
- national recognition Nil
- international recognition Nil

21. Special research laboratories sponsored by / created by industry or corporate bodies Ni

22. Publications: (2008-2014)

S. No.	Item	Total Numbers
1	Number of papers published in peer reviewed journals (national / international) *	296
2	Number of papers published in conferences	
3	Monographs	-
4	Chapters in Books	02
5	Edited Books	01
6	Laboratory Manuals	-
7	Articles in Magazines	-
8	Editorials	-
9	Books with ISBN with details of publishers *	10
10	Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.)	Web of Science, Scopus, Science Direct, Google Scholar
11	Citation Index – range / average (Highest Range)	02 –90
12	SNIP (Highest Range)	0.17 – 5.858
13	SJR (Highest Range)	0.128 – 3.119
14	Impact Factor – range	2.1 -5.723
15	h-index range	1-24

*See Annexures-ERD I: Publication.

S. No.	Name of Faculty	Designation	Book(s) Published Papers (2008-2014)	No. of Research (2008-2014)	h-index
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1	M. Zulfequar	Professor	02	87	19
2	M. A. Wahab	Professor	03	40	6
3	Mushahid Husain	Professor	01	92	24
4	Pankaj Sharan	Professor	01	01	03
5	Saeeduddin	Professor	0	02	04
6	Syed Sajjad Mehdi	Professor	0	02	03
7	Zahid Husain Khan	Professor	03 books, 01 chapter	17	06 Since 2000
8	Lekha Nair	Associate Professor	0	1	3
9	Anver Aziz	Assistant Professor	0	4	4
10	Arun Singh	Assistant Professor	0	7	4
11	Asad Niazi	Assistant Professor	0	17	12
12	Aurangzeb Khurram Hafiz	Assistant Professor	0	07	01
13	Azher Majid Siddiqui	Assistant Professor	0	11	10
14	Mohammed Ahsanul Hoda Ahsan	Assistant Professor	0	05	04
15	Mohammad Shahid Khan	Assistant Professor	03	28	09
16	Pumlianmunga	Assistant Professor	0	0	-
17	Sharf Alam	Assistant Professor	0	0	02
18	Somasri Sen	Assistant Professor	0	06	15
19	Syed Rashid Ahmad	Assistant Professor	0	03	01

Publications of Faculty members during (2008-2014); details are attached in individual annexure

Total number of Publications by faculty members during 2007-2014 = 296

h-index range = 1 - 24

23. Details of patents and income generated :

Nil

24. Areas of consultancy and income generated :

S. No.	Name of Faculty	Area of Consultancy
1.	Prof. M. Zulfequar	Invited Member: IGNOU for Designing PG syllabus
2.	Dr. Lekha Nair	Non-income Consultancy with Quasar Technologies, New Delhi on indigenous development of Ultra High Vacuum Scanning Tunneling Microscope(UHV-STM).
3.	Dr. Arun Singh	High Piezoelectric Transducers with Concord Electroceramics Industries -- Non-income
4.	Dr. Asad Niazi	Served on PG syllabus committee of IGNOU for designing the Atomic & Molecular Physics Course (2010)

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25. Faculty selected nationally/ internationally to visit other laboratories in India and abroad :--

S. No.	Name of Faculty	Visited Laboratory
1.	Prof. M. Zulfequar	(i) Participated in “Workshop on Physics Laboratory Education”, at IUC-DAEF, Indore, (Nov. 06-24, 1995) (ii) Visited International Center For Theoretical Physics, Italy, as an Affiliate to carry out Research in condensed Matter Physics, 17 Nov.-13 Dec.1996
2.	Prof. Zahid Husain Khan	Selected by DAAD Germany to visit and work in the Laser Laboratory of Department of Physics, University of Kaiserslaten, Fed. Rep. Germany (October – December 1987) under the DAAD Re-Visit Programme for Former DAAD Fellows.
3.	Dr. M.A. H. Ahsan	(i) International Conference : Antiferromagnetic nanowires: Heisenberg spin model revisited, M A H Ahsan , J Berakdar and M M Haque, Abstract Book, German Physical Society meeting, Dresden, Germany, March 2009 (ii) University Teacher Fellow, Institute of Mathematical Sciences, Chennai, India.
4.	Dr. Lekha Nair	Inter University Accelerator Centre, New Delhi, Surface Physics Laboratory, National Physical Laboratories, New Delhi.
5.	Dr. Mohd. Shahid Khan	Selected as Citizen Exchange Fellow in the SOUTH ASIA SCHOOL COLLABORATION PROJECT (SASCP) of Department of State, USA, funded and supervised by Bureau of Educational and Cultural Affairs, USA held at <i>Nova Southeastern University, Florida, USA</i> during October10 - November 5, 2005 and in Washington DC during November 5 – November 11, 2005. Interacted with the educator participants from Bangladesh, India, Pakistan, Sri Lanka and United States and completed 200 hours of studies.
6.	Dr. Arun Singh	(i) SPECLAB University of Puerto Rico, San Juan, PR,USA 2010-2011 (ii) University of Central Florida (UCF) Orlando, Florida, USA 2010-2011 (iii) Massachusetts Institute of Technology (MIT) Boston, MA, USA 2010-2011
7.	Dr. Somsari Sen	Associateship of IUCAA (Interuniversity Center of Astronomy and Astrophysics), Pune, India.
8.	Dr. Asad Niazi	i. Visiting Scientist at Advanced Materials Research Unit, SNB-NCBS, Kolkata (04 - 12 Oct, 2010). ii. Visiting Scientist at Helmholtz-Zentrum Berlin für Materialien

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		und Energie (HZB), Berlin, Germany (Apr – Jul, 2008). iii. Postdoctoral Fellow at Ames Laboratory, Ames, Iowa, USA (Nov 2003 – Nov 2007).
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26. Faculty serving in

- a) National committees
- b) International committees
- c) Editorial Boards
- d) Any other (please specify)

Prof. M. Zulfequar

1. UGC Nominee (SAP programme): Department of Physics, MD University, Rohtak (Prof .M. Zulfequar)
2. Membership of Academic Societies:(Prof..M. Zulfequar)
 - (i) Indian Chapter of ICTP, IIT, New Delhi
 - (ii) Meteorological Society of India.(Life Member)
 - (iii) Semiconductor Society of India. (*Executive Member*)
 - (iv) Indian Science Congress (Life Member)
3. Reviewer of the International Journals: (Prof. M. Zulfequar)
 - (i) Journal of Materials Chemistry and Physics
 - (ii) Philosophical Magazine Letter
 - (iii) Journal of Applied Physics
 - (iv) Physica B

Prof. Mushahid Husain

1. Member, Editorial Board of Indian Science Abstract, The Council of Scientific and Industrial Research, New Delhi 2008.
2. Member, Board of Management of the Centre for Theoretical Physics, JMI
3. Ex-UGC Nominee – Member, Board of Governors, NIT, Kurukshetra.
4. External Member Academic Council:
 - a) Dr. B.R Ambedkar University, Agra.
 - b) Central University of Punjab, Bhatinda
 - c) ITM University, Gurgaon, Haryana
5. External Member, Board of Studies:
 - a) Dept. of Physics National Institute of Technology, Srinagar.
 - b) Dept. of Applied Sciences, F/O Engg. & Technology, JMI.
 - c) Dept. of Electronics Engg, F/O Engg. & Technology, JMI.
 - d) Deptt. of Physics, Vanasthali Vidhyapeeth
 - e) Dept. of Physics, Jiwaji University Gwalior
 - f) Dept. of Applied Physics, F/O Engg. & Technology, AMU
6. External Member, Faculty Committee, Punjab University, Patiala

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- a. Ex-Associate Member, Third World Academy of Sciences, ICTP, Trieste (Italy)
- b. Fellow, Meteorological Society of India.
- c. Referee, X-ray Spectrometry (A Scientific Journal of USA)
- d. Referee, Physica B (U.S. A.)
- e. Referee, Indian Journal of Pure & Applied Physics (CSIR)
- f. Referee, Indian Journal of Physics, (IPA)
- g. Referee, Central European J. of Physics (Poland)
- h. Referee, J. of Non-Crystalline Solids (U. K.)

Prof. Z. H. Khan

- a) National committees
Member, Standing Committee, National Mission on Education through Information Communication Technology (NMEICT), Ministry of Human Resource Development, Govt. of India.
- b) International committees
- c) Editorial Boards
Member, Editorial Board of “Jauhar” Newsletter of Jamia Millia Islamia, New Delhi
- d) Any other (please specify) (Fellow /Member of any society/ Academy etc.)
Membership of Learned Associations/Societies:
Life Member, Indian Physics Association.
Life Member, Indian Laser Association.
Life Member, Indian Society of Atomic & Molecular Physics.
Life Member, Asian Physical Society.
Life Member, Astronomical Society of India.
Life Member, Indian Geological Congress.
Life Member, Indian Chapter of International Centre for Theoretical Physics

Dr. Arun Singh

- a) National committees
1. Member, Committee for Scientific & Technology Terminology of Commission for Scientific & Technology Terminology, MHRD, Govt. of India (2007)
2. Other Memberships:
 - a. Member of the Materials Research Society, MRS, Boston, USA
 - b. Member of the Electro chemical Society, ECS, Pennington, NJ, USA
 - c. Life Member of “Ultrasonic Society of India” New Delhi
 - d. Life Member of “Materials Research society of India”
 - e. Life Member of “The Indian Physical Society”, Kolkata
 - f. Member of Indian Association of Physics Teachers (IAPT)
 - g. Member of Indian Association for Canadian Studies, New Delhi

Dr. Asad Niazi

1. Member of American Physical Society

Dr. Azher M. Siddiqui,

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- (i) Indian Physical Society, Life Membership No. LM/0632
- (ii) Indian Laser Association, Life Membership No. LM/518
- (iii) Indian Physics Association, Life Membership No. DEL/LM/11888
- (iv) Materials Research Society of India, Life Membership No. LMB 160

Dr. Mohd. Shahid Khan

1. Life Member of Indian Laser Association, (Membership No. 917)
2. Affiliate Member of Institute of Physics, UK for the Year 2010-2011, (Membership No. 80029285)

27. Faculty recharging strategies

Please see Annexure –ERD II: Faculty recharging strategies

28. Student projects

- Percentage of students who have done in-house projects including inter-departmental projects :
All M.Sc. students are required to carry out a project in their Final Semester.

Prof. Z. H. Khan

A number of Ph.D. Scholars have worked on collaborative research projects with IIT Delhi, Jawaharlal Nehru University and National Physical Laboratory, New Delhi:

S. No.	Project Title	Collaborating Institution	Year	Name of Research Student
1	Studies on Enhancement in Optical Absorption and reduction in Minority Carrier recombination in Silicon Solar Cells	National Physical Laboratory, New Delhi	2011	Dr. Ashok Kumar Sharma
2	Synthesis of ZnO Based Nanophosphors for Applications in Solid State Light Emitting Devices	National Physical Laboratory, New Delhi	2011	Dr. K. Jayanthi
3	Application of Spectroscopy For Monitoring PAHs and Their Derivatives in The Urban Atmospheric Environment	Hawaharlal Nehru University, New Delhi	2004	Dr. Homdutt Sharma
4	Physico Chemical Characterization of Aerosols and Precursor Gases in and around Delhi.	National Physical Laboratory, New Delhi	2010	Dr. Khem Singh
5	Laser processing and Spectroscopic Characterization of Semiconductors Nanomaterials	Indian Institute of Delhi	2003	Dr. Khalid Mutashar Omar

Prof. M. Zulfequar

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Students are doing their project work in Material Science Laboratory, JMI

M.Sc. Project= Two student each year

M.Tech. (Nanotech) = One student each year

Dr. Mohd. Shahid Khan:

S. No.	Name of Student	Class & session	Title of Project	In –House/In Collaboration with
1	Sami ahmad	M.tech. (nanotech) Sem-iv 2011-2012	Foster's resonance energy transfer between rhodamine b and carbon nanotubes	In-house
2.	Ali jan adil	M.sc. Physics (final) 2011-2012	Nonlinear optical properties of 1,2-diamino-9,10-anthraquinone	In-house
3	Amir mushtaq	M.sc. Physics (final) 2011-2012	Optical gain of phenoxazone 660	In-house
4	Yogesh	M.sc. Physics (final) 2011-2012	Cavity ring-down technique for measurement of reflectivity of high reflectivity mirrors with high accuracy	Drdo and cnsnt, jmi
5	Arshi jamal	M.sc. Physics (final) 2010-2011	Reverse saturable absorption of rhodamine b at low intensities using cw laser at 532 nm	In-house
6	Jenu john	M.sc. Physics (final) 2010-2011	Storage of hydrogen on silicon nanotube- a computational study	In-house
7	Sangeeta	M.sc. Physics (final) 2010-2011	Optical gain of rhodamine-b using laser induced fluorescence method	In-house
8	Pratibha	M.sc. Physics (final) 2009-2010	Study of optical gain of 1,4-diamino-9,10-anthraquinone	In-house
9	Hardeep kumar	M.sc. Physics (final) 2009-2010	Solvent effect on absorption and laser induced fluorescence spectra of 5,8-dihydroxy-1,4-naphthoquinone	In-house
10	Sushma chauhan	M.sc. Physics (final) 2009-2010	Study of fluorescence energy transfer in quizarine-c60 system	In-house
11	Lal kishore sah	M. Sc. Electronics (final) 2009-2010	Fabrication of zno thin film by sol-gel method and its	In-house

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			characterization	
12	Aquil ahmad	M.sc. Physics (final) 2008-2009	Solvent effect on absorption and laser induced fluorescence spectra of 1,4-diamino-9,10-anthraquinone	In-house
13	Anant kumar sinha	M.sc. Physics (final) 2008-2009	Fluorescence quantum yield of rhodamineb in dimethyl sulphoxide	In-house
14	Nikhat anjum	M.sc. Physics (final) 2008-2009	Fluorescence resonance energy transfer in quinizarine-c70 system	In-house
15	Sonia	M.sc. Physics (final) 2008-2009	Electronic structure and spectroscopic properties of fluoranthene and fluorene in boric acid glass	In-house
16	Md. Shahzad khan	M.sc. Physics (final) 2007-2008	Electronic structure and spectroscopic properties of fluoranthene and benzo (k) fluoranthene using Extended huckel theory	In-house
17	M. Imran	M.sc. Physics (final) 2007-2008	Solvent effect on absorption and fluorescence spectra of 1,4-naphthoquinone and determination of dipole moment of its first excited state	In-house
18	Md. Hashmuddin	M.sc. Physics (final) 2007-2008	Optical spectroscopy of 1,4-dihydroxy-9,10-anthraquinone and determination of its fluorescence quantum yield	In-house
19	Ambuj bhusn jaiswal	M.sc. Physics (final) 2007-2008	Electronic absorption spectra of radical cations of anthracene and phenantheren	In-house
20	Roop chand	M.sc. Physics (final) 2006-2007	Electronic absorption spectra of naphthoquinone and its 2-hydroxy derivative using Extended huckel theory	In-house

Dr. Anver Aziz

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In house projects:

1. "Study of active filters" by Satish Chandra Mishra, M.Sc.(final),2010
2. "Quaternions" by Ravinder Kumar, M.Sc.(final),2010
3. "Solving differential equations using op-amp" by Mohd. Jafar Khan, M.Sc.(final),2011
4. "Clifford Algebra" by Harkesh Singh M.Sc.(final),2011
5. "Curved Geometry of Universe" by Mohd. Amir, M.Sc.(final)2012

Dr. Azher M. Siddiqui

S.No.	Name of Student	Year	Project Title
1.	Mohammad Kasim	2005	Preparation and Resistivity Measurement of $Mg_{1-x}Al_xB_2$
2.	Md. Shahabuddin Shah	2006	Theoretical Studies of Band Structure Modifications in Semiconductor Alloys
3.	Ravinder Singh Chauhan	2007	Effects of Temperature on Raman Spectroscopy in Si-Ge Samples
3.	Mohan Singh	2007	Processing of Materials by Low Energy Ions
4.	Devendra Singh	2008	Effect of Doping on Optical band Gap of p-toluene Sulphonic Acid Doped poly (o-Toluidine) Polymers
5.	Ajit Kumar	2008	Synthesis and Optical Characterization of p-toluene Sulphonic Acid Doped Poly (m-Toluidine) Polymers
6.	Aruna Gund	2009	Optical Characterization and FTIR Study of Poly (3-Octylthiophene)
7.	Pawan Kumari	2010	Electrical Conductivity of Polyaniline Doped With Ferric Chloride

Dr. Lekha Nair

In house projects: 11

Collaborative projects with other universities, industry, DRDO, etc.: 1 (collaboration with IUAC)

Dr. M.A.H. Ahsan

In house projects: Master's Thesis

- (1) Properties and Structure of Spinor Bose- Einstein Condensates (2011).
- (2) Role of Correlation in Quantum Dots: A Numerical Renormalization Group Approach (2011).
- (3) Renormalization Group in Quantum Many-Body Systems (2012).

Dr. Arun Singh

In house projects, Collaborative projects with other universities, industry, DRDO, etc

S.N.	Name of the candidate	Class/ Degree	Project Topic	Year
1	Shushil Kumar	M. Phil	'Kaons and anti kaons in hot & dense hadronic matter'	2008

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2	Neelam	MSc.	Characterization of Piezoceramics	2007
3	Sonam	MSc	Fabrication off eroelectric thin films	2007
4	Monika Gaur	MSc.	Synthesis of gold nanoparticle	2009
5	Jyoti Yadav	MSc.	Study of ZnO thin film	2009
6	Arun Tanvar	MSc.	Temperature dependence ferroelectric materials	2010

Dr. Syed Rashid Ahmad

In house projects:

1. 'A Molecular Dynamics Study of the Lennard-Jones Fluid' by Sanjivan Kumar, M.Sc. (final), 2009.
2. 'Numerical Study of Random Walks in One and Two Dimensions' by Vishal, M.Sc. (final), 2009.
3. 'Non Linear Dynamics' by Preeti Bhandari, M.Sc. (final), 2011.
4. 'Molecular Dynamics Simulation of the Lennard-Jones Fluid' by Manoj Kumar, M.Sc. (final), 2012.
5. 'Molecular Dynamics Simulation of Hard Sphere System' by Yogesh, M.Sc. (final), 2012.
6. 'Nonlinear Dynamics and Chaos' by Sushil Singh, M.Sc. (final), 2012.
7. 'Monte Carlo Simulation of 2d Ising Model' by Monu Mishra, M.Sc. (final), 2012.

Dr. Asad Niazi

In house projects

1. Study of Geometrical Frustration in Magnetic Systems – Pinki Singh (Master's Thesis, 4th Sem., 2012)
29. Awards / recognitions received at the national and international level by
- Faculty
 - Doctoral / post doctoral fellows
 - Students

Prof. Z. H. Khan

S. No	Name of the Award	Awarding Authority	Year and other details
1	Hony DAAD Advisor	Deutcher Akademischer Austauschdienst (DAAD), Germany	2006 – 2009 For Outstanding Commitment and Leadership in Promoting Indo-German Relations in Education
2	DAAD Fellow	Deutcher Akademischer Austauschdienst (DAAD) [German Academic Exchange Service], Bonn, Germany	1981-82 For Post-Doctoral Research Work at Free University Berlin, Germany
3	DAAD Fellow	Deutcher Akademischer Austauschdienst (DAAD)	1980-81 For Post-Doctoral Research Work at

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		[German Academic Exchange Service], Bonn, Germany	Ludwig Maximillian University, Munich, Germany
4	IUCAA Associate	Inter-University Centre for Astronomy & Astrophysics, Pune	July 1992 – June 1995 For pursuing research

Dr. M.A.H. Ahsan

S. No	Name of the Award	Awarding Authority	Year and other details
1	Research and Study Visit	Deutscher Akademischer Austausch Dienst (DAAD)- German Academic Exchange Service	2008, at Institute of Physics, Martin-Luther University, Halle-Wittenberg, Germany

Prof. Saeeduddin

S. No	Name of the Award	Awarding Authority	Year and other details
1	MAAS Best paper Award	MAAS	1995
2	MAAS Best paper Award	MAAS	1997

Dr. Arun Singh:

S. No	Name of the Award	Awarding Authority	Year and other details
1	BOYSCAST (“Better Opportunity for Young Scientists in Chosen Areas in Science and Technology”) Fellowship	Ministry of science and Technology, Govt. of India.	2010

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

Department of Physics Organized the following Seminars/ Conferences/Workshops during 2007-2012

1. Seminar on Nano-materials and Nano-Devices, January 30, 2008, Department of Physics, Jamia Millia Islamia
2. Seminar on Developments in Materials, High Energy and Nuclear Physics, February 20-21, 2008
3. National Seminar on Condensed Matter, High Energy and Nuclear Physics, March 23-24, 2009, Department of Physics, Jamia Millia Islamia, New Delhi- 110025
4. Fifteenth International Workshop on The Physics of Semiconductor Devices. December 15-19, 2009, Jamia Millia Islamia, New Delhi
5. National Seminar on Condensed Matter, High Energy and Nuclear Physics, Department of Physics, Jamia Millia Islamia, New Delhi, February 19-20, 2010
6. National Seminar on Condensed Matter, Nuclear and High Energy Physics, Department of Physics, Jamia Millia Islamia, New Delhi, Feb. 18-19, 2011

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7. Seminar on Progress in Physics of Materials and Theoretical Physics, Organized by DRS program, Department of Physics, Jamia Millia Islamia, New Delhi, Feb. 03, 2012

Department of Physics Organised the following Seminars/ Conferences/Workshops during 1987-2006

1. VI International Workshop on Physics of Matters, Jamia Millia Islamia, New Delhi (2rd Nov. to 5th Dec 1987)
2. Second National Conference on Disordered Materials, Department of Physics, Jamia Millia Islamia, New Delhi, Feb. 25-26, 1991.
3. National Seminar on Recent Trend in Nuclear, Particle and Condensed Matter Physics, Department of Physics, Jamia Millia Islamia, New Delhi, March 06-07, 1997.
4. National Seminar on Materials Research and Environmental Issues, Department of Physics, Jamia Millia Islamia, New Delhi, Oct. 23, 1997.
5. Ninth International Workshop on The Physics of Semiconductor Devices. December 16-21, 1997, Jamia Millia Islamia, New Delhi
6. Workshop on nanomaterials, Organized by Department of Physics, Jamia Millia Islamia, New Delhi and the Society for Semiconductor devices, November 1, 2002.
7. Quantum Theory : Perspectives and Challenges, Organized by Department of Physics, Jamia Millia Islamia, New Delhi on March, 7,2003.
8. Workshop on Nanostructure, Organized by Department of Physics, Jamia Millia Islamia, New Delhi on March, 11, 2004.

Abdus Salam Memorial Lectures Organized by the Department of Physics, JMI

S. No.	Date/Year	Speaker	Topic
1	21 st February, 2002	Prof. Jayant V. Narlikar, Inter University Centre for Astronomy & Astrophysics, Pune	Wxciting Developments on the Frontiers of Cosmology & Particle Physics
2	8 th January, 2003	Prof. Gerard 't Hooft (Nobel Laureate) Institute for Theoretical Physics, Universitet Utrecht, The Netherlands	The Universe Inside the Atom
3	20 th September, 2004	Prof. T.V. Ramakrishnan HomiBhabha Professor, Banaras Hindu University, Varanasi	Strongly Interacting Electronic Systems: Strange New Quantum Worlds
4	28 th February, 2006	Prof. T. Padmanabhan Inter University Centre for Astronomy & Astrophysics, Pune	Atoms of Spacetime
5	27 th October, 2006	Katepalli R. Sreenivasan	Abdus Salam and Experimental Science at ICTP
6	24 th November,	Prof. Douglas D. Osheroff (Nobel	How Advances in Science

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	2007	Laureate) Stanford University, Stanford, California, U.S.A	are Made
7	20 th February, 2009	Prof. MustansirBarma Director, Tata Institute Of Fundamental Research, Mumbai, India	Random Walks in Physics
8	13 th January, 2011	Prof. G. Baskaran Institute of Mathematical Sciences Chennai, India	Elementary Particles in Condensed Matter
9	24 th February, 2012	Prof. R. Rajaraman Jawaharlal Nehru University	Nuclear Energy : Problems and Prospects
10	30 th January 2013	Tariq Aziz <i>Tata Institute of Fundamental Research, Mumbai</i>	Quest for Genetic Code of the Universe -- A Legacy of Salam
11	17 th February 2014	Prof. Subodh R. Shenoy <i>Tata Institute of Fundamental Research, Hyderabad</i>	How does a system re- equilibrate after sudden cooling

31. Code of ethics for research followed by the departments

Researchers in the Department of Physics “Exercise professional integrity and, to the best of our judgment and capacity, work towards excellence in Physics teaching and research.”

32. Student profile course-wise:

(i) 2007-08

S. No.	Name of the Course (refer to question no. 4)	Annual Intake	Applications received	Selected		Total
				Male	Female	
1	B. Sc. (Hons.)	40	462	19	3	22
2	M. Sc.	40	202	22	14	36
3	Ph. D.	-	21	18	3	21

(ii) 2008-09

S. No.	Name of the Course (refer to question no. 4)	Annual Intake	Applications received	Selected		Total
				Male	Female	
1	B. Sc. (Hons.)	40	375	24	8	32
2	M. Sc.	40	156	16	11	27
3	Ph. D.	-	26	18	8	26

(iii) 2009-10

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S. No.	Name of the Course (refer to question no. 4)	Annual Intake	Applications received	Selected		Total
				Male	Female	
1	B. Sc. (Hons.)	40	529	16	4	20
2	M. Sc.	40	260	15	18	33
3	Ph. D.	-	72	11	8	19

(iv) 2010-11

S. No.	Name of the Course (refer to question no. 4)	Annual Intake	Applications received	Selected		Total
				Male	Female	
1	B. Sc. (Hons)	40	615	26	11	37
2	M. Sc. Physics (Semester)	40	382	22	11	33
3	Ph. D.	15	41	2	4	6

(v) (2011-12)

S. No.	Name of the Course (refer to question no. 4)	Annual Intake	Applications received	Selected		Total
				Male	Female	
1	B. Sc. (Hons.)	40	1579	15	5	20
2	M. Sc. Physics (Semester)	40	330	15	8	23
3	Ph. D.	15	64	1	6	07

(vi) (2012-13)

S. No.	Name of the Course (refer to question no. 4)	Annual Intake	Applications received	Selected		Total
				Male	Female	
1	B. Sc. (Hons.)	40	2517	30	9	39
2	M. Sc. Physics (Semester)	40	593	27	14	41
3	Ph.D.	12	67	6	2	8

(vii) (2013-14)

S. No.	Name of the Course (refer to question no. 4)	Annual Intake	Applications received	Selected		Total
				Male	Female	
1	B. Sc. (Hons.)	40	7059	34	5	39
2	M. Sc. Physics (Semester)	40	961	22	15	37
3	Ph.D.	13	65	05	02	07

33. Diversity of students (2011-2012)

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S. No.	Name of the Course (refer to question no. 4)	% 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
1	B.Sc.	-	-	-	-
2	M.Sc.	10%	25%	62%	3%
3	Ph.D.	17%	0%	73%	0%

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

S. No.	Name of Student	M.Sc. Passed Year	JRF -NET	GATE
1	Zaheer Abbas	2006	JRF (2009 Dec)	
2	Nidhi Joshi	2007	JRF (2009 Dec)	
3	Vani Jain	2007	JRF	
4	Vikas	2007	NET	
5	Haroon	2008		2011
6	Ambuj Bhushan	2008	JRF (2009 June)	2009
7	Navneet Kaur	2008	NET	
8	Nidhi Sharma	2008	NET (2011 June)	
9	Sunny Khan	2008		2012
10	Asha	2008		2009
11	Devendra Singh	2008	JRF (2009 Dec)	2010
12	Saritabaghel	2008	NET	
13	Sumit Kumar	2009	JRF (2009 Dec)	
14	Neetu	2009	NET (2010 Dec)	2010
15	Remya	2009	JRF (2009 Dec)	
16	Anant Kumar	2009	NET	
17	Aqueel Ahmed	2009	JRF (2012 June)	
18	Sonia Goyal	2009		2011
19	Medha Sharma	2010	NET (2010 Dec)	2011
20	Amit Sanger	2010	NET (2010 Dec)	2011
21	Anil	2010		2012
22	Arun	2010	NET	
23	Fizzah	2011		2012
24	Preeti Bhandari	2011		2012
25	Puneet sharma	2012		2012

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35. Student progression

S. No.	Student progression	Percentage against enrolled
1	UG to PG	15 %
2	PG to M.Phil.	NA
3	PG to Ph.D.	12%
4	Ph.D. to Post-Doctoral	-
5	Employed <ul style="list-style-type: none"> • Campus selection • Other than campus recruitment 	-
6	Entrepreneurs	-

36. Diversity of staff

S. No.	Percentage of faculty who are graduates	
1	of the same university	5%
2	from other universities within the State	35%
3	from universities from other States	55%
4	from universities outside the country	5%

37. Number of faculty who were awarded Ph.D., D.Sc. and D.Litt. during the assessment period Nil

38. Present details of infrastructural facilities with regard to

S. No	Infrastructural Facilities	Information
1	Library	1(DRS/COSIST funded)
2	Internet facilities for staff and students	Yes
3	Total number of class rooms	04
4	Class rooms with ICT facility	0
5	Students' laboratories	05 (UG , PG and Computer lab)
6	Research laboratories	08*

* Materials lab-1, Materials lab-2, Nanotech lab, Nano-photonic lab, X-ray lab, Crystal Growth lab, Laser and Spectroscopy lab, SEM lab, computer cluster lab

39. List of doctoral, post-doctoral students and Research Associates

Please see Annexure –ERD III: List of doctoral, post-doctoral students and Research Associates etc.

40. Number of post graduate students getting financial assistance from the university. Nil

41. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology.

Improve the teaching lab (UG and PG) and space in the department

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42. Does the department obtain feedback from
- Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?
 - The Department regularly holds its Faculty and Board of Studies meetings and incorporates the suggestions from the Experts/External Members of the Board of Studies in the curriculum.
 - Students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?
 - Class Representatives are elected for each class and the feedback from the students is obtained through them.
 - Alumni and employers on the programmes offered and how does the department utilize the feedback?
 - Alumni are invited to deliver extension lectures in the Department and their expertise is utilized to enrich teaching and research of the Department.

43. List the distinguished alumni of the department (maximum 10)

S. M. Shahid, Director Bureau of Industrial Standard

Dr. Harsh, Ex. Deputy Director, SSPL, New Delhi

Dr. V. P. S. Awana, Scientist E, National Physical Laboratory.

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

Please see Annexure –ERD IV: student enrichment programmes.

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

Class Room Teaching

In this method we use Black / White boards as well as LCD / OHP projectors to have two-way information sharing with the students

UG: Using the Black Board in classroom

PG: Using the Black Board and Power Point Presentation in classroom. The Experiments are demonstrated in the teaching lab.

M. Tech: Using Power Point Presentation in classroom

Ph.D.: Using Power Point Presentation in classroom and discussion with their research work

For teaching M.Sc. Physics students, faculty members use multimedia technology in classrooms as and when needed. This includes

- Power point presentation,*
- Videos using YouTube, Teachertube and iTunesU,*
- MIT Open Course*
- Physics Applets and Simulations.*

Assignments

Regular assignments are evaluated to assess the knowledge and understanding of students.

Student Seminars

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Topic based presentations by student's help them not only in better understanding of the subject but it also helps in development of their complete personality.

Field Trips

Organizing field trips to various laboratories (e.g. NPL, SSPL, IUAC, IIT, JNU, and DU) in and around Delhi help students to gain first hand information about the experimental realization of their theoretical understanding.

Lectures, Seminars and Workshops

We organize regular seminars and workshops delivered by experts to enhance the peripheri of students' understanding on a particular subject and encourage them to join Research and Development activities that are important for Nation building.

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

The Board of Studies of the Department meets regularly and reviews the academic programmes of the Department.

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

Students and Faculty actively participate in organizing Conferences/Workshops/Seminars and Extension Lectures.

Please see Annexure –ERD IV: participation of students and faculty in extension activities

48. Give details of “beyond syllabus scholarly activities” of the department.

Physics Association of the Department organizes Quiz, Lecture Competition, Invited Talks, and Video Lectures of eminent Scientists.

PHYSICS ASSOCIATION:

Activities of Physics Association are mentioned hereunder:

List of Events (2010-11)

- September 01, 2010: Physics Lecture by Prof. M A Wahab
- October 19, 2010: Physics Lecture by Prof. M A Wahab
- November 12, 2010: Physics Lecture by Prof. Ajoy Ghatak
- February 10, 2011 : Quiz Competition
- February 23, 2011: Lecture-cum-Presentation Competition
- March 12, 2011: Farewell + Prize Distribution Ceremony of Physics Association.

List of Events (2011-12)

- November 18, 2011: Quiz Competition (General)
- February 1, 2012: Physics Quiz
- February 11, 2012: Visit to Suraj kund Mela
- February 15, 2012: Lecture Competition
- March 1-4, 2012: Trip to Udaipur
- March 14, 2012: Physics Lecture by Prof. Deepak Kumar
Title: Magnetism and Thermodynamics of Cluster Compounds
- March 15, 2012: Physics Lecture by Prof. Paula Maria Vilarinho

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Title: Electrical Field Assisted Deposition of Functional Thick Films

- April 20, 2012: Presentation by MSc (IVsem) on 'General Relativity'
- April 27, 2012: Physics Lecture by Prof. M A Wahab

Title: Some Important Concepts of Solid State Physics

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.

- Negative Dielectric Constant in Amorphous Semi conductor: Physica B (The Netherlands), 271 (1999) 125-135.
- As far as the generation of new knowledge is concerned, the research publications are its good example.
- Another source of generation of new knowledge is through workshops and conferences, where experts present their research works and discuss about the innovations.

51. Future plans of the department

- Development of UG and PG Teaching lab. It has been planned that some new modern practicals will be introduced which will be in accordance of their theory papers. In M.Sc, more experiments will be introduced which will be of fabrication type. Students will first fabricate the apparatus and then will take observations.
- PG Specialized labs: The Department plans to strengthen the existing expertise in the area of Materials Science, Computational Condensed Matter Physics, Laser Spectroscopy, Photonics and High Energy Physics.
- After the completion of DRS Phase III, the Department now plans to upgrade this to DSA.
- The Department plans to start a Solar Photo Voltaic Laboratory Training Programme for Science and Engineering Graduates in collaboration with Industries and Academic Experts.
- Considering that technology plays a very important role in teaching and learning, use of technology in teaching of PG/UG courses should be adopted as a policy. To achieve this, smart classrooms needs to be set up. Apart from this, e-content development and development of simulation experiments needs to be taken up by each faculty which, in our institutions, is still lacking. This will help in promoting education through distance and open learning mode, apart from benefitting our own students.
- Starting 4 years interdisciplinary BSc course.
- Having full-fledged tutorial classes taken by different professor, other than the one taking the main paper.
- Having an active, vibrant academic environment beyond usual curriculum, involving discussion groups, problem solving groups, audio-visual presentations etc.

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- Improvement of teaching laboratories (more experiments as well as more units of existing experiments) as funds gets allocated to the department.
- Organize student visits to National Labs in Delhi to develop interest in research.
- Facilitate participation of our students in undergraduate summer programmes at National Labs.
- Make available to all students a database of video and audio material in the form of lectures/films/java animations/problem solving techniques, etc., so that they can review the concepts covered in class and improve their understanding and skills and consequently their performance in all India level exams.
- Review the question papers of our entrance exams each year and develop a series of question banks based on what is available in comparable situations around the country and on the net, so that the standard of students we get can be improved.
- The Department may strengthen the existing expertise in the area of Material Science, Laser Spectroscopy and Photonics.
- We may start an Integrated M.Sc. in Physics (5 year course) with components of teaching of physics in collaboration with IASE, Faculty of Education, JMI.
- Another area with potential is computational material science for which we have to develop some good computational facility and can have collaboration with other institutes in Delhi and in the country for sharing the computational facilities.
- In the next five years, Dr. M. A. H. Ahsan plan to work in the following research areas:
- Using many-body techniques like dynamical mean field theory (DMFT) on model Hamiltonians, an attempt will be made to develop and understanding of pairing mechanism, pseudo-gap phenomenon and other related issues in high temperature superconductors.
- Using exact diagonalization techniques issues like fragmented condensates, vortices in spinorial Bose-Einstein condensates will be studied.
- Using exact diagonalization, numerical renormalization group techniques, we plan to understand the role of electron-electron correlation on transport in single and double quantum dot systems, with possible applications to nanodevices.
- Using exact diagonalization techniques, study the J_1 - J_2 in two dimensions and J_1 - J_2 - J_c quantum spin models in three dimensions for developing an understanding of various magnetic systems like undoped cuprate superconductors, iron pnictides

52. Detail any five Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.

SWOC

Strengths

- i. The Department offers three specializations namely Material Science, Lasers & Spectroscopy and Theoretical Physics in M. Sc. Physics. This offers a wider choice to cater to the diverse interest of the students.

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Curricula at post graduate as well as at undergraduate level are regularly reviewed and upgraded to keep pace with the latest developments and challenges in the field.

The Department has been continuously improving and expanding its curricula and has introduced two new courses, namely B.Sc. (Instrumentation) course (1996) and M. Tech (Nanotechnology) course (2007).

- ii. Our post graduate students have the opportunity to work in research labs of the Department as part of their course requirement. This allows them to gain hands-on experience in the research labs. They are also encouraged to visit various laboratories in and around Delhi with whom the faculty members of the Department have ongoing collaborations.

The students further have the opportunity to attend research seminars organized throughout the year by the Department and associated research centres. Further, the Department organizes a fortnightly seminar by the research scholars on their work.

- iii. Our class sizes are relatively small allowing us to maintain a favorable student-teacher ratio. This helps students have individual attention from teachers and hence the teaching is more interactive in nature.

- iv. In recognition of its strong research base, the Department received Departmental Research Support scheme (DRS) status under SAP Programme of UGC in 1994. Under DRS phase I (1994-1999), the Department received a research grant of Rs. 35.00 lakhs. In DRS phase II (2000-2005), the Department was granted Rs. 40.25 lakhs for further expansion of its research activities. The DRS Phase III (2006-2011) for which the Department was granted Rs. 33.0 lakhs, has just been completed successfully. The Department also received additional Infrastructure grant of Rs. 40.0 lakhs from UGC under SAP programme during 2008-2010. Under these programmes, equipment such as Wipro Workstation, Differential Scanning Calorimeter, Computer cluster, X-ray Diffractometer, I-V characterization setup, were purchased.

Under COSIST Programme of UGC, funds of Rs. 67.5 lakhs were given for strengthening the research programme of the Department. Further, the Department received Rs. 67.0 Lakhs under FIST Scheme of DST for strengthening of research and PG Labs. High end research equipment such as, Closed cycle Helium Refrigerator, Sputtering unit, Scanning Electron Microscope, UHV system were purchased from these funds.

In addition to the above, many Major Research Projects have been awarded to faculty members from various funding agencies like DRDO, DST, DIT, UGC etc., to the tune of Rs. 510.381 lakhs.

As a result of these efforts and Plan funds from the university, a number of state of the art equipment has been set up for our expanding research activities. These include, LPCVD and PECVD for the growth of CNTs, Keithley I-V Characterization set up for material characterization, Field emission set up for nano-materials, Czochralski crystal growth set up, Cavity Ring Down Spectroscopy set up for sensitive detection of trace substances, and RF Plasma polymerization setup for growth of conjugated polymers etc.

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The Department, in collaboration with Inter University Accelerator Centre, New Delhi, has also set up an *in situ* Ultra High Vacuum Surface Analysis system in the Low Energy Beam-line at the Centre, under a Memorandum of Understanding between JMI and IUAC. The IUAC is a National facility set up by the UGC for promoting research in the area of Accelerator based physics.

- v. Besides University Library, the Department has established its own Library from grants received under COSIST and SAP schemes. It has a substantial collection of physics books on advanced topics, accessible to our PG students, research scholars and faculty members.

The Department has a well-equipped computer lab with internet connection catering to the instructional needs of students, research scholars and faculty members. The Department is a part of the campus wide LAN. To cater to its computational needs, the Department has established a 6-node Computer Cluster.

- vi. Faculty members have been actively engaged in frontier areas of research which has culminated in formation of two research centres, namely, Centre for Theoretical Physics and Centre for Nanoscience and Nanotechnology.

Weaknesses

- i. The number of students in various courses has been steadily growing and the Department is currently facing acute shortage of space. Basic infrastructural facilities such as a lift, drinking water on each floor and sufficient numbers of toilets are lacking in our building.
- ii. The Department teaching labs lack sufficient space, infrastructure as well as funding for equipments. The Development Funds received on per student basis have been inadequate.
- iii. The Department does not have enough non-teaching (administrative and technical) staff and formal training program for them. The Department needs assistants for the Departmental library and more lab assistants and attendants for teaching and research labs.
- iv. Modern teaching aids such as projectors, smart class-rooms and teaching through ICT are yet to be set up. Computer facility with internet access is only available to PG students at this time.
- v. The Department needs a separate Seminar Hall so as to be able to conduct faculty-student seminars, instructional video screenings and invited talks. While we have a departmental library with books, there is no reading room where the students can study.

Opportunities

- i. Having successfully completed three phases of DRS scheme, the Department may now go for upgrading this SAP programme to DSA of SAP.
- ii. The Department may go for a more flexible Choice Based Credit System for M.Sc. as well as B. Sc. Students. New specializations at M.Sc. level may also be introduced.
- iii. At the time of admission to the Undergraduate programme, following the implementation of Semester system, the students should undertake common course-work for first two years. Based on their interest and performance in the first 2 years, students can opt for Honours subject in the 3rd year.

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- iv. Once the university is able to provide infrastructure such as smart classrooms, the department will be able to integrate technology in teaching of PG/UG courses in a seamless manner. At present audiovisual facility is not available in the classrooms.
- v. E-content development and development of simulation experiments needs to be taken up by the faculty. This will help in promoting education through distance and open learning mode, apart from benefitting our own students.

Challenges

- i. The number of our students qualifying national level exams such as IIT-JAM/NET/GATE/JEST, etc., is currently very low. While this may be a reflection of the mixed backgrounds that our students are drawn from, we must, in the time to come, work on finding ways improve both the quality of students joining the Department as well as their performance upon graduation.
- ii. The teaching load of faculty is as per the standard specified by UGC, which is uniform for colleges teaching UG students, as well as for integrated universities such as ours which have UG, PG, and Ph.D. research students. When it comes to seeking research funding, we have to compete with scientists from purely research institutions such as national labs as well as faculty of institutions like IIT's and IISER's, where the teaching hours per week are much fewer. This puts us at a serious disadvantage, and curtails our research output, because the time available to devote to research is severely limited. Research in our university would benefit greatly if the time devoted to Ph.D. Students, as well as for M.Sc. projects were included as part of the teaching load in our university. It may require the recruitment of more faculty and we would be able to do justice to all of our students.
- iii. The Department needs to design curricula with better interface with the industry and research labs so that the students get advantage of emerging industries in the area of semiconductor technology, Renewable Energy, Nanotechnology, and Optoelectronics.
- iv. The Department should consider starting innovative courses at post graduate level with better job opportunities. We need to promote interactions with industry leaders to identify the kinds of trained manpower that are sought after in the country.
- v. Establishment of state of the art research equipments as part of Central facility viz. Supercomputing facility, HRTEM, Micro-Raman Spectroscopy, Low-Temperature facility, Photoluminescence set up, STM and magnetic measurement set up.