

Evaluative Report of the Department- A

1. Name of the Department School of Instrumentation
2. Year of establishment 1991
3. Is the Department part of a School/Faculty of the university? Yes
4. Names of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.)

Programmes	Number	Course/Subjects
UG	-	
PG	02	<ul style="list-style-type: none">• M.Tech. in Instrumentation• M.Sc. in Instrumentation
Integrated Masters	-	
M.Phil.	-	
Ph.D.	1	Instrumentation
Integrated Ph.D.	-	
Certificate	-	
Diploma	-	
PG Diploma	-	
Any other (please specify)	-	
Total	03	

5. Interdisciplinary programmes and departments involved

The programmes being offered at the school are of interdisciplinary nature.
6. Courses in collaboration with other universities, industries, foreign institutions, etc.

No course is being run in collaboration with other universities, industries, foreign institutions etc.
7. Details of programmes discontinued, if any, with reasons : Nil
8. Examination System: Annual/Semester/Trimester/Choice Based Credit System

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

Nil

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

Teaching Positions	Sanctioned	Filled	Actual (Including CAS & MPS)
Professor	1	0	0
Associate Professor	1	0	1
Assistant Professor	3	1	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./ M.Phil./ M.Tech. students guided for the last 4 years
Dr. Ratnesh Gupta	M.Sc., Ph.D.	Associate Professor	Nanotechnology, Magnetic Thin film, Analytical Instrumentation, Embedded System	21	Ph.D.: 02 M.Tech.: 05

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

Dr. D.M. Phase, UGC DAE CSR, Indore.
 Mr. R.K. Agrawal, RRCAT, Indore.
 Mr. K. Saiffee, RRCAT, Indore
 Prof. A.L. Sharma, Retd. Professor, SOI< DAVV, Indore.
 Dr. R.J. Choudhary, UGC DAE CSR Indore.

13. Percentage of classes taken by temporary faculty – programme-wise information : There is no temporary faculty

Percentage of classes taken by visiting faculty – programme-wise each semester wise information

1. Programme: M.Tech. in Instrumentation

Academic Year	2012-13	
Semester	First	Second
Percentage of classes taken by visiting faculty	30%	30%

2. Programme: Pre Ph.D. course work in Instrumentation

Academic Year	2012-13	
Semester	First	Second
Percentage of classes taken by visiting faculty	20%	20%

14. Programme-wise Student Teacher Ratio

No.	Programme	Student Teacher Ratio
1.	M.Tech. in Instrumentation	18:1
2.	Ph.D.	2:1

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

S.No.	Sanctioned Post	Sanctioned	Vacancy
1	Technical Post	14	04

Administrative Staff:

S.No.	Sanctioned Post	Vacancy
1	Upper Division Clerk-I	01
2	Lower Division Clerk	01
3.	Peon	01

16. Research thrust areas as recognized by major funding agencies

Nanotechnology, Thin film growth, hard coatings, Magneto-Optic Thin Films and devices. Analytical Instrumentation, Use of Synchrotron Radiation Source for characterization and device fabrication, Laser Treatments.

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, project title and grants received project-wise.

Name of the Faculty	Project Title	Funding Agency	Grant Received (Rs.)
Dr.Ratnesh Gupta	“Laser nitriding and carburization of metals and steels and their photoelectrons studies on INDUS-I”	Board of research In Nuclear Sciences, Dept. of Atomic Energy, Mumbai, NATIONAL	14,91,000/-
Dr.Ratnesh Gupta	“Synthesis of Nano-composite Materials for Application of High Performance Permanent Magnets”,	DST-DAAD India- Germany. INTERNATIONAL	3,38,000/-
Dr.Ratnesh Gupta	“To investigate the electronic structure of Nitride and Carburized of thick films using AIPES beamline of Indus-I”	UGC-DAE CSR , Indore. NATIONAL	7,10,000/-
Dr.Ratnesh Gupta	“To study shape transformation of magnetic nanoparticles induced by Swift Heavy Ions”	Inter-University Accelerator Centre, New Delhi. NATIONAL	6,03,000/-

18. Inter-institutional collaborative projects and associated grants received

a) National collaboration:

No MOU is signed. With the help of collaboration several research papers have been published. However, the school is having in-principle collaboration with the following institutions for research and internships:

S.No.	Name of Institute	Starting Year
1	Centre for Advance Technology, (RRCAT), Indore	Since 1992

2	UGC DAE CSR Indore Centre, Indore	Since 1994
3	Inter-University Accelerator Centre, New Delhi.	Since 1996
4	Indira Gandhi Centre for Atomic Research, Kalpakkam, Tamilnadu.	Since 2004
5	CEERI, Pilani	Since 2001

b) International collaboration: List of international collaboration. Several international research papers have been published. A DST-DAAD project has been sanctioned in 2008 with Inst. of Physics-II, Univ. of Goettingen, Germany.

S.No.	Name of Institute	Starting Year
1	Material Section, Dept. of Mechanical Engg., Univ. of Padova, Italy.	Since 1994
2	Inst. of Physics-II, Univ. of Goettingen, Germany.	Since 2001
3	Inst. of Ion Beam Physics, Dresden, Germany.	Since 2006
4	Inst. of , Univ. of Ilmenau, Germany	Since 2007

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

Nil

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: Nil

22. Publications:

* Number of papers published in peer reviewed journals (national / international): 14 National: 0; International: 14

- * Monographs 0
- * Chapters in Books 2
- * Books edited 0
- * Books with ISBN with details of publishers 0
- * Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, EBSCO host, etc.): All the research papers published by the faculty has been listed by tthe SCOPUS, Web of Science etc.
- * Citation Index – range / average : Some research papers have been quoted more than 50 (from SCOPUS) Total citation of Dr. Ratnesh Gupta: 439 (as on 26 Aug. 2013)
- * SNIP
- * SJR
- * Impact Factor – range / average : from 1.0 – 4.0/2.5
- * h-index : Dr. Ratnesh Gupta : 11 (i-10 index : 11)

Google Scholar citation Graph of Dr. Ratnesh Gupta as on 26.08.2013



23. Details of patents and income generated

Nil

24. Areas of consultancy and income generated

Nanotechnology, Thin film and Magnetic Multilayers
Income Generated: Nil

25. Faculty selected nationally / internationally to visit other laboratories / institutions

/ industries in India and abroad : Dr. Ratnesh Gupta has awarded Associate Fellow from International Centre for Theoretical Physics, Trieste, Italy in 2002. And he has visited Univ. of Padua, Padua, Italy and other research laboratories in Germany under this scheme in 2009.

26. Faculty serving in

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

No faculty is serving in national and international committees.

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

The faculty members are encouraged for participating in recharge programmes like faculty development programmes, refresher courses, capacity building programmes, etc. The faculty members have participated in the following seminars/ workshops and delivered invited talks and presented the work:

1. 15th International Conference on Surface Modification of Materials by Ion Beam 2007 (SMMIB-2007), held at Univ. of Mumbai, India.
2. International Conference on Magnetic Materials (ICMM-2007), held at SINP, Kolkata.
3. National Workshop on “Applications of Ion Beam in Device Fabrication and Nanotechnology”, held at School of Instrumentation, Devi Ahilya Univ., Indore, India.
4. International Conference on Recent Trends in Physics, held at School of Physics, Devi Ahilya Univ., Indore, India.
5. National Conference on Nanostructuring by Ion beams (NIB 2011) held at Univ. of Allahabad, India.
6. 12th International Conference on Surface X-ray and Neutron Scattering (SXNS-12), held at SINP, Kolkata, India.
7. International Conference on Swift Heavy Ions in Material Engineering and Characterization (SHIMEC 2012), held at IUAC, New Delhi, India.
8. Discussion Meeting on Recent Developments in Magnetic Materials and Thin Films (RDMMTF-2013), held at UGC DAE CSR, Indore, India.

Lectures have been arranged as follows:

Pt. Madan Mohan Malviya Lecture Series-2012

Seminar on Fostering Excellence in Research on 15/01/2013

28. Student projects

- percentage of students who have done in-house projects including inter-departmental projects

Year	2009	2010	2011	2012
Percentage of in-house projects	0%	0%	0%	26%

- percentage of students doing projects in collaboration with other universities
/ industry / institute

Year	2009	2010	2011	2012
Percentage of projects in collaboration with outside agencies	100%	100%	100%	74%

29. Awards / recognitions received at the national and international level by faculty:

Dr. Ratnesh Gupta awarded ASSOCIATE fellow from Abdus Salam International Centre for Theoretical Physics, Trieste, Italy from 2002-2009.

- Doctoral / post doctoral fellows :

Dr. Ashish Khandelwal received KSKRA research award from Dept. of Atomic Energy, Mumbai in 2009. He did his Ph.D. under the supervision of Dr. Ratnesh Gupta.

- Students Nil

30. Seminars/ Conferences/Workshops organized and the source of funding (national

/ international) with details of outstanding participants, if any.

S.No.	Name of Speakers	Affiliation
	In “National Workshop on Applications of Ion Beams in Device Fabrication and Nanotechnology” 5th-6th March 2012	
1	Prof. K. RamaReddy	Univ. of Osmania, Hyderabad
2	Dr. B. K. Panigrahi	IGCAR, Kalpakkam
3.	Prof. Ajay Gupta	UGC DAE CSR Indore

4.	Dr. P. Sahoo	NISER, Bhubneshwar
5.	Dr. S.K. Deb	RRCAT, Indore
6.	Prof. D.C. Kothari	Univ. of Mumbai, Mumbai
7.	Prof. S. Patil	Univ. of Pune, Pune
8.	Dr. M. Gupta	UGC DAE CSR Indore
9.	Dr. N.P. Lalla	UGC DAE CSR Indore
In “National workshop on Instrumentation” 15th July 2013		
1	Prof. K. RamaReddy	Univ. of Osmania, Hyderabad
2	Prof. RamSagar	ARIES, Nainital
3.	Prof. R.C. Verma	Univ. of Patiala, Punjab.
5.	Dr. P. Pancharia	CEERI, Pilani, Rajasthan
6.	Dr. S. Chouhan	CSMCRI, Bhavnagar, Gujrat
7.	Dr. Vipul Arora	RRCAT, Indore
8.	Dr. Vishal Dhamgaye	RRCAT, Indore

31. Code of ethics for research followed by the departments

- Respect for Intellectual property rights of individual and institutions
- Explicitly acknowledge the work of others when referring to them in any shape, form or manner in the research work.
- Follow principles of ethical and social responsibility
- Selection of research topics directly related to the society or nation.

32. Student profile programme-wise:

Name of the Course (refer to question no. 4)	Applications received	Selected		Pass percentage	
		Male	Female	Male	Female
Ph.D. (Instrumentation)	08	01	00	12%	00
M.Tech. (Instrumentation)	230	12	08	55% Marks in B.E. / M.Sc. in relevant field	
M.Sc. (instrumentation)	10	00	00		

33. Diversity of students

Name of the Course	% 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
Ph.D.	100%	00%	00%	00%

Name of the Course	% 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.Tech.	05%	80%	15%	00%

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

GATE qualified students take admission in M.Tech. programmes.

NET cleared students: 02

1. Mr. Mohan Patel in 2009.
2. Ms. Sakhi Somani in 2012

35. Student progression

Student progression	Percentage against enrolled
UG to PG	Not applicable
PG to M.Phil.	Not applicable
PG to Ph.D.	20%
Ph.D. to Post-Doctoral	30%
Employed	
• Campus selection	NA
• Other than campus recruitment	100%
Entrepreneurs	10%

36. Diversity of staff

Percentage of faculty who are graduates	
of the same university	50%
from other universities within the State	0%
from universities from other States	50%
from universities outside the country	0%

37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt.

during the assessment period

Nil

38. Present details of departmental infrastructural facilities with regard to

- a) Library: Printed books-titles (300) volumes (932), e-books-50.
- b) Internet facilities for staff and students: Available on 40 computers
- c) Total number of class rooms 2
- d) Class rooms with ICT facility 2
- e) Students' laboratories 8
- f) Research laboratories 2

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

a) from the host university :

- 1. Dr. Ashish Khandelwal
- 2. Dr. R. Ansari
- 3. Dr. Shobhit S. Chouhan
- 4. Mr. Rajendra Sharma
- 5. Ms. Sheetal Soni
- 6. Mr. Sagar Sen
- 7. Mr. Ashish Gupta

b) from other universities

- 1. Mr. Santosh Kumar
- 2. Ms. A.H. Kiranmayee

No post-doctoral and Research Associates are working at present.

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

- 13 AICTE Scholarships for GATE Qualified M.Tech. students in each M.Tech. program
- State Govt. provides financial support to SC/ST students and sub-income level OBC students generously
- Ph.D scholarships from research projects (if available)

Scholarships	2010-11	2011-12	2012-13	2013-14
--------------	---------	---------	---------	---------

Research Scholarships under the Research project	1	1	2	2
AICTE Scholarships	4	8	11	13
SC/ST Scholarships	1	1	4	0
OBC Scholarships	0	0	7	0

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

No new programme was development during 2008-12.

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?

Faculty feedback on curriculum is used in upgrading the syllabi.
Faculty feedback on teaching-learning-evaluation is used for further improvement or using new methods.

- b. students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?

Students' feedback on staff is not taken.

Students' feedback on curriculum is used in upgrading the syllabi.
Students' feedback on teaching-learning-evaluation is used for further improvement.

- c. alumni and employers on the programmes offered and how does the department utilize the feedback?

The feedback from alumni and employers is used to upgrade the syllabi and designing of the new programmes.

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

1. Dr. Ashish Khandelwal, Scientist 'D', R.R. Centre for Advanced Technology, Indore. **(Awarded in Feb. 2010)**
2. Dr. P.C. Pancharia, Senior Scientist, CEERI, Pilani (Rajasthan). **(Awarded in**

March 2003)

3. Dr. Shobhit Singh Chouhan, Senior Scientist, Central Salt and Marine Chemical Research Inst. Bhavnagar. **(Awarded in Aug. 2012)**
 4. Mr. Manish Kothari, Entrepreneur, Cardicomm, Indore. (specialized in BioMedical Instrumentation) **(in May 1994)**
 5. Mr. O.P. Patel, Entrepreneur, MAP embedded solutions, Indore. (specialized in Embedded Systems) **(in July 2006)**
 6. Mr. Ankit Soni, Project Engineer, SUNPHARMA, Mumbai. **(in July 2012)**
 7. Ms. Apeksha Jain, Project Engineer, SUNPHARMA, Mumbai. **(in July 2012)**
 8. Mr. K. Chandrashekhar, PRICOL, Limited, Coimbatore. **(in May 1994)**
 9. Mr. Sandeep Chaturvedi, Head (design), Gallium Arsenide Enabling Technology, Centre, Hyderabad. (DRDO lab) **(in May 1999)**
 10. Mr. Ravi Sindal, Inst. Of Engg. And Technology, DAVV, Indore. **(in May 2000)**
44. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts.

The following external experts delivered special lectures:

(i) National Workshop :

1. National Workshop on Applications of Ion Beam on Device Fabrication and Nano-Technology (March 2012)
2. National Workshop on Instrumentation (July 2013)

(ii) Special Lecture:

1. During Shanti Sawrup Bhatnagar Award 2009
2. Prof. C.N. Murthy, Applied Chemistry Dept., M.S. Univ. Vadodara. (Augug. 2012).
3. Prof. Ramsagar, Director, ARIES, Nainital. (Jan. 2013).
4. Prof. K. Rama Reddy, Retd. Professor, Osmania Univ., Hyderabad. (March 2012).
5. Mr. G. Verma, Senior Manager, ARCON, Wind Energy, Dewas. (June 2013)

6. Prof. R.C Verma, Professor, Univ. of Patiala, Punjab (July 2013)

The following special lectures were arranged at the University Level:

Lectures by awardees of Shanti Swarup Bhatnagar award.

Lecture by Bharat Ratna Dr. A.P.J.Abdul Kalam

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

Traditional as well as modern teaching methods, like-LCD projectors, video, group discussions, are used in all the programmes.

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

Programme Objectives and Learning Outcomes:

Programme	M.Tech. (Instrumentation)
Objectives	The programme is designed to educate in the field of Instrumentation. Our strength is in the field of Embedded system, Automation and Signal processing. The programme trains students to become professionals who are competent to choose from various methods when facing a particular problem in the field of Instrumentation.
Learning Outcomes	<p>(i) Fundamental knowledge in – Programming Skills, Embedded Systems, Process Control and Signal processing, Mathematical Modeling.</p> <p>(ii) Advanced knowledge in Embedded Systems and Image Processing.</p> <p>(iii) Ability for employment in Engineer, Maintenance Engineer Higher education as teacher, and scientist. Govt. jobs.</p> <p>(iv) Ability for higher education and research in the areas of Nanotechnology and Sensor Development</p>

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

Visited RRCAT Indore for the hand on experience on the use of Synchrotron Radiation sources such as INDUS-I and INDUS-II. Students visited the different laboratories of UGC-DAE CSR Indore.

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

Students work on advanced topics and publish their research papers. The students have published one research paper in the year 2012-13 in the areas of instrumentation.

49. State whether the programme/ department is accredited/ graded by other agencies? If yes, give details.

No accreditation / grading by any other agency.

AICTE approval for the M.Tech. programmes being run.

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

The contributions of the department in generating new knowledge, basic or applied can be described with the followings:

A. Book Chapters

1. “Photofunctions of dye encapsulated nanostructured silica films suitable for optical filter applications”; Shobhit Singh Chauhan, A L Sharma, R V Jasra; Engineering Applications of Nanoscience and Nanomaterials, Material Science Forum, Eds. Ajay Bansal and R J Tayade, Trans Tech Publications, Switzerland (in Press).
2. “Artificial Neural Networks based Biomimetic Systems for Classification and Authentication of beverages/foods/drinks applications”
A L Sharma et al to be published in International Frequency Sensor Association (IFSA) Publishing, Barcelona, Spain, 2013 (In Press).

B. Research Publication in International Journals:

1. Shobhit Singh Chauhan, R V Jasra, **A L Sharma**, “Phenol red dye functionalized nanostructured silica films as optical filters and pH sensors”, Industrial & Engineering Chemistry Research, 2012, 51, 10381–10389.

2. Shobhit Singh Chauhan, R V Jasra, **A L Sharma**, “Dye immobilized mesoporous silica thin films as optical pH sensor”, *International Journal of Nanoscience* 11(3), 2012, 120001-1-120001-5.
3. AH Kiranmayee, PC Panchariya & **AL Sharma**, “New data reduction algorithm for voltammetric signals of electronic tongue for discrimination of liquids”, *Sensors and Actuators A* 187(2012) 154-161.
4. Hepsiba K. Anga, P C Panchariya & **AL Sharma**, “Authentication of Indian Wines Using Voltammetric Electronic Tongue Coupled with Artificial Neural Networks”, *Sensors and Transducers Journal*, Vol. 145, Issue 10, October 2012, pp. 65-76.
5. S. Kumar, PC Panchariya, Bhanu Prasad P. and **A L Sharma**, “Non Destructive Classification of Himalayan Orthodox Black Teas”, *Sensors and Transducers Journal*, Vol. 145, Issue 10, October 2012, pp. 77-85.
6. “Phase Transitions in Co Thin Film Induced by Low Energy and High Energy Ion Beam Irradiation”,
Ratnesh Gupta, A. Khandelwal, D.K. Avasthi, K.G.M. Nair, and A.Gupta,
J. Appl. Physics **107** (2010) 033902.
7. “Characterizations of iron oxide films prepared by laser irradiation in oxygen atmosphere”,
Ratnesh Gupta, A. Khandelwal, Ajay Gupta, and Peter Schaaf,
J. Physics D: Applied Physics **42** (2009) 185305.
8. “Investigation of structural and magnetic properties of nanoscale Fe/Co bilayers”,
Ratnesh Gupta, AshishKhandelwal, Raisa Ansari, Ajay Gupta, K.G.M. Nair,
Surf.and Coatings Tech. **203** (2009) 2717.
9. “Argon and krypton ion-induced changes in permalloy thin films”,
Ratnesh Gupta, K. P. Lieb, Y. Luo, G. A. Müller, P. Schaaf and K. Zhang,
Euro.Phys. J. B **63** (2008) 501.
10. “Influence of Cr-ions on the magnetic behaviour of FeCo film”,
Ratnesh Gupta, Raisa Ansari, AshishKhandelwal, J. Fassbender, Ajay Gupta,
Nuclear Instru.and Methods B **266** (2008) 1407.

11. "Evolution of nano-crystalline phases with post-annealing of nitrogen irradiated Fe/Co bilayers",
Ratnesh Gupta, AshishKhandelwal, Raisa Ansari, K.G.M. Nair, W. Leitenberger, U. Pietsch, D.M. Phase, Ajay Gupta
Nuclear Instru.and Methods B **266** (2008) 1705.
12. " Structure and hydrogen storage properties of MgH₂catalysed with La₂O₃",
Ratnesh Gupta, F. Agresti, S. Lo Russo, A. Maddalena, P. Palade, G. Principi,
J. Alloys & Compd. **450** (2008) 310.

C. In Conference Proceedings:

1. "Structural Characterization and Electronic Structure of Laser Treated TiN Thin Film",
SheetalSoni, K.G.M. Nair, D.M. Phase, Ratnesh Gupta,
AIP 1477 (2012) 677.
2. " Effect of low energy ion on Magnetic and Structural properties of FeCo alloy thin film",
Ratnesh Gupta, Raisa Ansari, AshishKhandelwal, A. Gupta, A. Tripathi,
K.G.M. Nair,
J. Scientific Conference Proceedings **1** (2008) 59.
3. Panchariya PC, Palit AK, Popovic D & **Sharma AL**, "Simple fuzzy rule generation for fuzzy modelling and identification", ***1st Indian International Conference on Artificial Intelligent***, Hyderabad, India, Dec. 18-20, 2003.
4. Panchariya PC, Palit AK, Popovic D & **Sharma AL**, "A Simple and Fast Complete Fuzzy Modelling Scheme for Takagi-Sugeno fuzzy Models using Genetic Algorithms" ***1st Indian International Conference on Artificial Intelligent***, Hyderabad, India, Dec. 18-20, 2003.
5. Panchariya PC, Palit AK, Popovic D & **Sharma AL**, "Structure Identificationfor Neuro-fuzzy Models" ***IEEE international conference on Intelligent Systems***, Verna, Bulgaria, June 22-23, 2004.
6. Panchariya PC, Palit AK, Popovic D & **Sharma AL**, "An Automated Approach for Extracting Fuzzy rules from data" ***World Congress on Lateral Computing***, 17-19th Dec., Bangalore, India, 2004. **(Best paper award)**

7. Panchariya PC, Sharma R., **Sharma AL** & Popovic D. “Clustering approaches for Fuzzy modelling” *International Conference on Instrumentation*, 17-19th Dec., Pune, India, 2004.
8. Panchariya PC, & **Sharma AL**, “Generating fuzzy rules from data” *Intelligent signal processing and robotics (ISPR)*, Allahabad, India , Feb. 20-23, 2004.
9. Panchariya PC, Shekhawat RS & **Sharma AL**, “Simple, transparent and yet accurate fuzzy modelling” *Intelligent signal processing and robotics (ISPR)*, Allahabad, India, Feb.20-23, 2004.
10. Panchariya PC, Sharma R, **Sharma AL** & Popovic D. “Water Adsorption isotherms of tea materials during withering” *International workshop and symposium on industrial drying*, IWSID-2004, 20-23 Dec., Mumbai, India, 2004.
11. Shobhit Singh Chauhan, R V Jasra, **A L Sharma**, Mesoporous Silica Thin Films - A Reliable Sensor for Measuring pH of Water, International Conference on Recent Trends in Materials Science and Technology, (ICMST-2010), October, 29-31, 2010, Trivandrum, Kerala.
12. Shobhit Singh Chauhan, R V Jasra, **A L Sharma**, Dye immobilized mesoporous silica thin film as optical pH sensor, International Conference on Nanoscience, Nanotechnology and Advanced Materials (NANOS-2010), December, 17-19, 2010, Visakhapatnam, Andhra Pradesh.
13. Shobhit Singh Chauhan, R V Jasra, **A L Sharma**, Optical functions of nanostructured silica films for pH sensing Third International Conference on Frontiers in Nanoscience and Technology, (COCHIN NANO2011), August 14-17, 2011, Kochi, Kerala.
14. AH Kiranmayee, PC Pancharia, P. Bhanu Prasad and **A L Sharma**, “Biomimetic Classification of Juices”, IEEE, ICST- Dec., 2012, Kolkata.
15. Santosh Kumar, PC Pancharia, Ashu Gulati and **A L Sharma**, “Classification of Himalayan Teas Using Vis-NIR Spectroscopy”, IEEE, ICST-Dec., 2012, Kolkata.

D. In National conferences:

1. Panchariya PC, Sharma R & **Sharma AL**, “Dual frequency based novel on-line lossy dielectric parameters (R_x, C_x) measurement system”, ***National Symposium on Instrumentation***, Pantnagar, India, Nov. 2003 .
2. Panchariya PC, Sharma R & **Sharma AL**, “A Microcontroller based moisture measurement system” ***National Symposium on Instrumentation***, Pantnagar, India, Nov. 2003 .
3. Panchariya PC, Shekhawat RS & **Sharma AL**, “Forecasting time series using fuzzy models” ***National Seminar on Emerging Trends in Soft Computing Based Artificial Intelligence***, Jodhpur, India, Feb. 27-29, 2004.
4. Panchariya PC, Shekhawat RS & **Sharma AL**, “Identification of fuzzy models using clustering” ***National Seminar on Emerging Trends in Soft Computing Based Artificial Intelligence***, Jodhpur, India, Feb. 27-29, 2004.
5. Shobhit Singh Chauhan, R V Jasra, **A L Sharma**, Optical sensor for pH measurement, 6th All Gujarat Research Scholars Meet (AGRSM-VI), January 31, 2010, M. S. University, Vadodara, Gujarat.
6. Rajendra Sharma, Santosh Kumar, P C Panchariya & **A L Sharma**, “Application of spectroscopy for identification of counterfeit drug”, March 5-6, 2012, School of Instrumentation, DAVV, Indore, Madhya Pradesh.
7. Santosh Kumar, Rajendra Sharma, P C Panchariya & **A L Sharma**, “Assessment of the quality of Indian tea using spectroscopy”, March 5-6, 2012, School of Instrumentation, DAVV, Indore, Madhya Pradesh.
8. Shobhit Singh Chauhan, R V Jasra, **A L Sharma**, Study of physical and optical pH sensing characteristics of functionalized nanostructured silica thin films Applications of Ion Beam in Device Fabrication and Nanotechnology, March 5-6, 2012, School of Instrumentation, DAVV, Indore, Madhya Pradesh.
9. Shobhit Singh Chauhan, R V Jasra, **A L Sharma**, Soft Sensors: “A New Measurement Tool for Complex Experimental Conditions”, , March 5-6, 2012, School of Instrumentation, DAVV, Indore, Madhya Pradesh.

Research Projects:

Project Title	Funding Agency	Grant Received (Rs.)
“Laser nitriding and carburization of metals and steels and their photoelectrons studies on INDUS-I”	Board of research In Nuclear Sciences, Dept. of Atomic Energy, Mumbai, NATIONAL	14,91,000/-
“Synthesis of Nano-composite Materials for Application of High Performance Permanent Magnets”,	DST-DAAD India-Germany. INTERNATIONAL	3,38,000/-
“To investigate the electronic structure of Nitride and Carburized of thick films using AIPES beamline of Indus-I”	UGC-DAE CSR , Indore. NATIONAL	7,10,000/-
“To study shape transformation of magnetic nanoparticles induced by Swift Heavy Ions”	Inter-University Accelerator Centre, New Delhi. NATIONAL	6,03,000/-

The school has produced following students since 1991 who are serving the nation:

M.Tech. (Instrumentation)	365 (approx.)
M.Sc. (Instrumentation)	15
Ph.D.	07

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

Strengths:

- Long time International collaborations and National Collaborations
- Continuous Academic exchange among the School, UGC DAE CSR Indore Centre and R.R. Centre for Advanced Technology, Indore.
- Students placement (National and International)
- Renowned faculty
- Access of every laboratory to everyone.

Weaknesses

- Need of additional faculty.
- Decreasing supporting and administrative staff.
- Need of additional industry in the area of instrumentation.

Opportunities

- New International and National collaborations will improve research standards and opportunities to students.
- Improvement in Research skills and aptitude of faculty and students to further improve the quality of teaching and research.
- Adjunct faculty positions of funding agencies like DST for raising teaching standards.
- International fellowships for faculty will enhance the communication and research skills further.

Challenges:

- National and global level laboratories and professional competences in the field of instrumentation.
- Recruitment of permanent faculties is an urgent need of the department.
- Procedural delay should be improved.
- Improper implementation of leave rules for faculties to avail research fellowships.
- Institutional subscription must be there to access National and International research journals.

52. Future plans of the department.

1. Plans to start following PG programmes:

(i) M.Tech. in Nanotechnology

2. Collaborations with the reputed research organizations, and industries.

3. Research projects from funding agencies.

4. Development of Infrastructure:

(i) Digital Image Processing Laboratory

(ii) Surface Technique Laboratory

(iii) Thin Film Growth Laboratory

Write up of efforts for Quality Sustenance and Assurance in the department- B

The following efforts are helpful:

The action plan was prepared by the IQAC in the beginning of the year towards quality enhancement and the outcome achieved by the end of the year. For quality assurance, self analysis and feedback through discussion with academic peers and students was practiced.

Students played a role in quality improvement by giving suggestions. Department worked with a goal to provide best possible knowledge in the field and for the overall development of the students through regular teaching, seminars and discussion with them. Several Teaching laboratories have come up with state of art technology. In Research laboratory, we have developed *in-situ* physical measurements setup during the growth of the thin film and during the heat treatments.

Regular updating of the course contents for advanced knowledge of various topics was done by the concerned teachers.

Research activities were always encouraged and available facilities were provided to the students and other researchers of the university.

Feedback from students, alumni and academicians was routinely taken, analysed and implicated for updating and development through such a practice the course paper.

Participated in following IQAC lectures:

- (i) Quality issues in Paper Setting and Evaluation, Sept. 28, 2012
- (ii) Fostering Excellence in Research, Jan. 15, 2013
- (iii) Quality issues in Teaching Learning Processes, May 10, 2013
- (iv) CBCS and Design of Academic programs for student centric learning, Lecture by Prof. Rege, College of Engineering, Pune, May 15, 2013

Declaration by the Head of the Department- C

I certify that the data included in this Self-Study Report (SSR) are true to the best of my knowledge.

This SSR is prepared by the institution after internal discussions, and no part thereof has been outsourced.

I am aware that the Peer team will validate the information provided in this SSR during the peer team visit.

Signature of the Head of the
institution with seal:

Place: Indore
Date: 26-08-2013