SELF STUDY REPORT

Name of the Department : **School of Chemical Sciences, Faculty of Science**
Year of establishment : **1976**

A.1 Academic programs offered by the department at present, under the following categories and Sanctions pertaining to each of the Courses.

Programmes	Number	Course/Subjects
UG	Nil	Nil
P.G.	03	M.Sc. (Chemistry) M.Sc. (Applied Chemistry) M.Sc. (Pharmaceutical Chemistry)
Ph.D.		As per faculty specialization

A.1.1 Details approval/recognition and recommendations issued by the statutory body (for example, (UGC, AICTE, NCTE, PCI, MCI, and DCI): **UGC**

A.2 Copy of Ordinances related to the courses in the department: (File A.1)

A.3 Number of working days during the last academic year: 185 days

A.4 Number of positions in the Department, their appointment letters, joining reports and sanctions of each

Positions	Teaching faculty			Non-teaching staff	Technical staff
	Professor	Associate Professor	Assistant Professor		
Sanctioned by the UGC / University / State Government	02	05	04	05 Class III +10 Class IV = 15	03 (Sr. Tech) +01 (Lab Tech) = 04
Recruited	01+07(CAS)		01 (Contractual)		
Yet to recruit	01	01			
Number of persons working on full time, temporary or contract basis	08 (full time)		01 (contractual)		

A.5 Qualifications of the teaching staff

Highest Qualification	Professor		Associate Professor		Assistant Professor		Total
	Male	Female	Male	Female	Male	Female	
Permanent teachers							
D.Sc./D.Litt.	02						02
Ph.D.	05 (All)	03					08
M. Phil.		01					01

A.6 Copies of Latest Biodata of Faculty in positions in the Department:

(File A.2)

A.7

1. **Copies of Yearly Performa Based Assessment Records of Faculty in positions in the Department: (File A.3)**
2. **Number of teaching posts sanctioned and filled (Professors/Associate Professors/Asst. Professors)**

	Sanctioned	Filled
Professor	02	01
Associate Professors	05	04
Asst. Professors	04	04

3. **Faculty profile with name, qualification, designation and specialization (D.Sc./D.Litt./ Ph.D./M.Phil., etc.)**

Name	Qualification	Designation	Specialization	No. of Years of Exp. (in This Univ.)	No. of Ph.D. students guided for the last four- years
Dr. R. Prasad	M.Sc., Ph.D.	Professor (CAS)	Physical	31	02
Dr. K. K. Pandey	M.Sc., Ph.D., D.Sc.	Professor	Inorganic	32	Nil
Dr. A.V. Bajaj	M.Sc., Ph.D.	Professor (CAS)	Organic	32	Nil
Dr. Ashok Kumar	M.Sc., Ph.D., D.Sc.	Professor(CAS)	Physical	27	02
Dr. H. P. S. Chauhan	M.Sc., Ph.D.	Professor (CAS)	Inorganic	23	02

Dr. Sheela Joshi	M.Sc., Ph.D.	Professor (CAS)	Organic	30	02
Dr. Pratibha Sharma	M.Sc., Ph.D.	Professor (CAS)	Organic	23	02
Dr. Savita Khare	M.Sc., Ph.D.	Professor (CAS)	Organic	23	02
Mr. Pankaj Bariya	M.Sc. NET	Asstt. Professor (Contractual)			

List of senior Visiting Fellows, faculty, adjunct faculty, emeritus professors: **Nil**

Percentage of classes taken by temporary faculty: **N/A**

Programme-wise Student Teacher Ratio: **13:1 (120 students: 9 Faculty)**

Number of academic support staff (technical) and administrative staff: sanctioned and filled: **05 (Tech), Adm. Staff: one**

A.8.1 Students enrolled in the department during the current academic year, with the following details: Year 2011-12 & 2012-13

Students	UG	PG (in two sem.)		Integrated Masters	M.Phil.	Ph.D 2008-13	D.Litt./ *D*.Sc.
		2011-12	2012-13				
	*M *F	*M *F	*M *F	*M *F	*M *F	*M *F	*M *F
From the state where the university is located	-	47, 44	35, 37	-	-	18 , 12	-
From other states of India	-	5, 2	1, 1	-	-	3, 0	-
Total		52, 46 Total : 98	36, 38 Total : 74			21, 12 Total : 33	

*M-Male *F-Female

Calculation of 'Unit cost' of education
(Unit cost = total annual recurring expenditure (actual) divided by total number of students enrolled)

(a) Including the salary component = **Rs. 1.15 Lakh per student**
(b) Excluding the salary component = **Rs. 25,000 per student**

A.8.2

A. Faculty recharging strategies
   1. Teachers of the School supported the activities of Academic Staff College for running refresher courses.

   2. Workshops on:
      (i) Quality issues in paper setting and evaluation on Sept. 26, 2012.
      (ii) Quality issues in teaching learning processes on May 10, 2013.
      (iii) C.B.C.S. by Prof. Rege, Maharashtra Govt. College of Engineering, Pune on May 15, 2013.
      (iv) "Challenges in Higher education" by Padmashri Prof. M.S. Sodha on June 17, 2013.

   3. Participation in conferences and workshops.
   4. Post Doctoral studies for short periods in International Laboratories.

B. Number and list of faculty with course details of faculty development programs, academic staff college programs or other faculty recharge programs
   i) Dr. A. V. Bajaj participated in NME-ICT program (SAKSHAM) in association with Microsoft on June 10, 2013 to June 20, 2013.
   ii) Dr. Pratibha Sharma attended 'Users Meeting' at CDRI, Lucknow on January 10, 2011 and Workshop at IIT, Indore on February 22-23, 2013.
   iii) Faculty members of the School are doing collaborative research with national institutes and various international universities.

International Collaboration of the Professors:

Prof. K. K. Pandey

Alexander von Humboldt Fellow, Germany	(July, 2010- September, 2010) (University of Wurzburg, Germany) (August, 2011- October, 2011) (University of Marburg, Germany)
Visiting Professor, Departament de Quimica, Universidad Autonoma de Barcelona, Spain	May, 2008- June, 2008
Emerson Fellow, Emerson Centre for Scientific Computation, Emory University, USA	July, 2008- September, 2008
Visiting Professor, Departament de Quimica, Universidad Autonoma de Barcelona, Spain	May, 2009
Institute of Chemical Research of Catonia (ICIQ), Tarragona, Spain	June, 2009- July, 2009
Emerson Fellow, Emerson Centre for Scientific Computation, Emory University, USA	August, 2009- October, 2009

(1) Prof. G. Frenking
Faculty of Chemistry,
University of Marburg,
Germany

(2) Prof. Phillip P. Power
Department of Chemistry
University of California Davis
USA

(3) Prof. Agusti Lledos
Department of Chemistry,
University of Autonoma Barcelona, Spain

(4) Prof. F. Maserus
Institute of Chemical Research of Cataonia (ICIQ),
Tarragona, Spain

(5) Dr. D. G. Musaev
Director
Emerson Centre for Scientific Computation,
Emory University, USA

(6) Prof. D. C. Liotta
Editor: J. Medicine Chem. Letters (American Chemical Society, USA)
Department of Chemistry,
Emory University, USA

(7) Prof. Simon Aldridge
Department of Chemistry,
Oxford University, UK

(8) Prof. Holger Braunschweig
Department of Chemistry,
University of Wurzburg, Germany

(9) Prof. Cameron Jones
School of Chemistry
Monash University, Australia

Dr. Ashok Kumar

Visited University of Pecs, Hungary under Indo-Hungarian Exchange Program	Nov.10, 2008 – Feb.9, 2009

A.9 Student projects:

Students have done their project work from following institutes of repute in last five years:

1. National Chemical Laboratory (NCL), Pune
2. Indian Institute of Chemical Technology (IICT), Hyderabad
3. Indian Institute of Technology(IIT),New Delhi
4. Central Salt and Marine Chemicals Research Institute(CSMCRI), Bhavnagar
5. Ranbaxy, Dewas
6. Cipla, Indore
7. North-East Institute of Science and Technology, RRL- CSIR, Jorhat, Assam
8. Indian Institute of Science, Bangalore
9. IPCA Pharmaceutical, Indore
10. IPCA Pharmaceutical, Ratlam
11. UGC-DAE CSR, DAVV Campus
12. Reliance Industries Limited Petrochemical Baroda(Gujarat)
13. Nicholas- Piramal Healthcare, Indore
14. Department of Chemistry, University of Delhi
15. Cadila Pharma Ahemdabad(Gujarat)
16. RRL(AMPRI-CSIR),Bhopal
17. Maulana Azad Natinal Institute of Technology(MANIT), Bhopal
18. Bhabha Atomic Research Centre, Trombay,Mumbai
19. Institute of Animal Health and Veternary Biological Research Centre Mhow(M.P.)
20. Dr. Reddy's Laboratories, Hyderabad

A.10 Awards / recognitions received at the national and international level by:

Faculty

School has strong connections through research collaborations. Faculty members served as referee to review research papers from national and international journals.

(1) Prof. K.K. Pandey has been awarded prestigious **Alexander von Humboldt fellowship** and he is regularly availing this opportunity to visit Germany.
(2) Prof.Ashok Kumar has been awarded by **Indo –Hungarian exchange fellowoship (Nov.2008-Feb.2009)**
(3) Prof.Pratibha Sharma (in Teacher Category) has been awarded by "**Best Science Research Award of MPCST in 2010"**
(4) Prof.Ashok Kumar (in Teacher Category) has been awarded by "**Best Science Research Award of MPCST in 2012"**
(5) Dr.Pratibha Sharma received **"D.R.D.E. Award - 2012"** (Shri K. M. Rao Award for Entomological Sciences) for the best publication in Parasitology Research

Students

(1) Ms.Vinita Sahu (in Student Category) has been awarded by "**Best Science Research Award of MPCST in 2010"**
(2) Mr. Pankaj Patidar (in Student Category) has been awarded by "**Best Science Research Award of MPCST in 2012"**
(3) Mr. Prabal Bandyopadhyay received Third Prize in Poster Presentation in "International Conference on Chemistry for Mankind (ICCM-2011)", held at Nagpur, India during Feb.09-11, , 2011.

(4) Ms.Sheenu Bhadoriya awarded in 2nd Bhartiya Vigyan Sammelan held during Dec.1-9,2009
(5) Dr. Atul Moghe (an alumnus of the deptt.1996-1998) has received "**Young Pharmaceutical Analyst Award 2010"**
(6) Ms.Sarabjot Kaur (M.Sc.2012) has been awarded **Shyam Prasad Mukherjee (SPM) fellowship** on being secured **7th** All India rank in NET examination**.**

A.11 Record of each of Seminar/ Conference/Workshop organized and the source of funding (national / international) with details of outstanding participants, if any.

1. The faculty of the school supported the academic programme of National Conference of "Shanti Swaroop Bhatanagar Award Winners" held on 8-10 March, 2007 and 17-19 July, 2009. Eminent Shanti Swaroop Bhatnagar awardees in Chemical Sciences and related areas were as follows-

(1) Dr. A. Ajayghosh
National Institute for Inter-disciplinary Science, Thiruvanthapuram
(2) Dr. Amalendu Chandra
IIT, Kanpur
(3) Dr. Srikanth Sastry
Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore
(4) Dr. Anil Bharadwaj
Vikram Sarabhai Space Centre, Thiruvanthapuram
(5) Dr. G.P.S.Raghava
Institute of Microbial Technology, Chandigarh
(6) Dr.B.S. Murty
IIT Madras, Chennai
(7) Prof A.K. Ghatak
Emeritus Professor I.I.T. Delhi

2. The school organized a National Seminar on the theme entitled **"Emerging Trends in Chemical Sciences"** in 2012 on 20th March 2012. Faculty members have interacted with eminent scientists. Following eminent persons were invited to deliver their scientific talks:

(1) Prof. B. Vishwanathan, IIT, Madras, Chennai
(2) Prof. Deepak Gupta, IIT, Kanpur
(3) Prof. P. Yogeeshwari, BITS, Pilani, (Hyderabad Campus)
(4) Prof. Akhilesh Verma, University of Delhi, Delhi

3. The School organized a seminar on March, 4, 2013 on the occasion of "National Fire safety day which was very well attended by faculty members, students, research scholars of different schools of the university.

A.12A Write up of Code of ethics for research followed by the department

- In order to foster excellence in research and maintain a research environment of intellectual integrity, as well as scholarly and scientific rigour, our school follows the principles of code of research ethics.
- School works in an environment governed by regulations and policies which must be followed within a core of ethical principles.
- School obeys the tanets of ethical principles in its day to day research activities viz., honesty, accuracy, efficiency, objectivity, with strong concern for conserving the environment.

A.12B Student profile course-wise:

Name of the Course	**Applications received**	**Selected**		**Pass percentage** (in U.G.)			
		Male	Female	Male		Female	
M.Sc. (Chemistry, Pharm. Chem., Applied Chem.): for 20 seats each in 2012-2013 (Admitted in I Semester)	352	32	27	Max.	Min.	Max.	Min.
				76.25%	52.11%	81.70%	65.42%

A.13 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**
M.Sc. (Chemistry, Pharm. Chem., Applied Chem.) : 20 seats for each in 2012-2013	85	12	3	Nil

A.14 Record of how many students have cleared Civil Services and Defence Services examinations, NET, SET, GATE and other competitive examinations? Give details category-wise.

1. Mr.Pushpendrea Kushwah has qualified State Civil Services examination (P.S.C.) in 2010 and appointed as Assitant Commissionar, Cooperative Societies in Govt. of M.P.
2. Following students have been qualified for NET/ GATE during last four years. Faculty members are taking tutorials to assist weak students for their learning and to help good students for their preparation in NET/GATE examinations.

   (1) Pankaj Patidar NET (OBC) [2009]
   (2) Vinita Sahu NET (OBC) [2009]
   (3) Premansh Dudhe NET (OBC) [2010]
   (4) Anil Yadav NET (OBC) [2011]

(5) Pankaj Bariya NET, JRF (ST) [2012]
(6) Monika Ahuja GATE(UR) [2011]
(7) Pramod Kumar Gavel GATE (OBC) [2012]
(8) Kuber Singh Rawat GATE (OBC) [2012]
(9) Sunil Kumar Patidar GATE (OBC) [2011]
(10)Sarabjot Kaur[2013] All India Rank -7
(11)Pallavi Gupta[2013] All India Rank -13

A.15 Record of Student progression

Student progression	Percentage against enrolled
PG to Ph.D.	**10%**

A.16 Record of Diversity of staff

Percentage of faculty who are graduates	
of the same university	25
from other universities within the State	25
from universities from other States	50
from universities outside the country	Nil

A.17 Number of faculty who were awarded Ph.D., D.Sc. and D.Litt. during the last four years

N/A

A.18 Present details of infrastructural facilities in the department with regard to

a) Departmental library: Books of Rs. 5 lakhs from being purchased through central library.
Total No. of Titles procured out of UGC XI plan = **112**
Total No. of Books in Central Library for Chemical Sciences= **643**
Total No. of Titles (Books, Volumes, Theses) in Departmental Library: Volumes =**966**
Titles =**710**
Total area of the library (in Sq. Mts.): **240 Sq. Mts.** (Adequate area is available for intake of 60 seats)

b) Internet facilities for staff and students: All rooms of teachers are equipped with computer and internet connections with following details

No. of Internet connections	: 12
No of Desktops	: 20
No. of Printers	: 10
No. of Scanners	: 03

c) Total number of class rooms : 04
d) Class rooms with ICT facility : 04
e) Students' laboratories : 01
f) Sophisticated Instrument's Lab : 01
g) Research laboratories : 08

h) Central Library facilities are nearly 20 meters away. There is huge collection of books of Chemical Sciences.

A.19 List of doctoral, post-doctoral students and Research Associates (during last five year)

Post –Doctoral: 01

Dr.Reena Dwivedi: Women Scientist (DST) (17-9-2009 to 17-9-2012)
Ref.No.DST.SR/S9/z/-11/2009

Doctoral Awarded: 12

(1) Dr. Siya Upadhyay (2008)
(2) Dr. Rajeev Dixit (2009)
(3) Dr. Samidha Saxena (2010)
(4) Dr. Anju Das Manikpuri (2010)
(5) Dr. S. V. Mahajan (2010)
(6) Dr. Purti Bilgaiyan (2011)
(7) Dr. Sumit Bhatiya (2011)
(8) Dr. Lal Kumar (2011)
(9) Dr. Vinita Sahu (2011)
(10) Dr. Rajendra Chokhare (2012)
(11) Dr. Bhagwan Lal Kalal (2012)
(12) Dr.Abhilasha Bakshi (2013)

Doctoral Pursuing: 21

(1) Pankaj Patidar (Submitted)
(2) Jitendra Singh (Submitted)
(3) Prabal Bandopadhyay
(4) Pawan Sharma
(5) Prerna Kumari
(6) Anju Pathak
(7) Jaswant Carpenter
(8) Teena Pareek
(9) Akrati Verma
(10) Annapurna Mehta
(11) Priti Shrivastava
(12) Prabhakar Sharma
(13) Sapna Joshi
(14) Premansh Dudhe
(15) Monika Ahuja
(16) Nitin Dubey
(17) Ujla Daswani
(18) Sunil Patidar
(19) Pankaj Bariya
(20) Jagat Singh Kirar
(21) Rahul Singh Jhala

Records of financial assistance and Number of post graduate students getting financial assistance from the University, UGC, State, AICTE: Ph.D. students getting scholarship: **04**

1. Research fellowships are provided to few research students under different projects
2. NET/ GATE qualified students are getting their own fellowships
3. Students are getting assistance from SC/ST cell as well.SC/ST/OBC students are getting scholarship from state government. The total number of such students is 40 (2012-13).

A.20 Methodology of need assessment exercise undertaken before the development of new programme(s):

Admission of the students is being done as per the notifications/guidelines of the university within the given time span. The process of admission will be comprises of entrance test followed by counseling. Course plan is prepared after a long series of discussions with faculty members and getting inputs from stake holders. School has always adopted the philosophy of updating the curriculum time to time as a result new avenues of knowledge is incorporated and vibrant link is maintained with contemporary requirements.

A.21 Records of feedback from

a. Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?
Brain storming sessions held in School of Chemical Sciences with active involvement of entire faculty. There is transparency in academic discussions and innovative practices are encouraged to ensure transformation of teaching into effective learning.

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

Feedback of the students is taken regularly for all the faculty members as well as curriculum and teaching-learning-evaluation. Students' feedback was analyzed. Overall rating of the faculty members was very good. The students are advised to provide feedback on teaching-learning to evaluate teachers on various points like

a) Ability to bring conceptual clarity and promotion of thinking ability by teacher
b) Motivation provided
c) Teacher's communication Skill
d) Teacher's regularity and punctuality
e) Teacher's subject knowledge
f) Completion and coverage of course
g) Complimenting theory with practical examples
h) Teacher's interaction and guidance outside the classroom.
i) Teacher's overall performance.

A.22 List the distinguished alumni of the department (maximum 10)

(1) Ms.Trupti Kulkarni, Global Project Manager, Reckit Benkiser Pharmaceuticals, Richmond VA, USA(passed out in 1988)
(2) Dr Prem lata Gupta, Head, Department of Chemistry, IPS Academy, Indore (passed out in 1991)

(3) Dr. Rama Kant Shukla, Senior Vice –President, Jubilant Life Sciences, Noida (passed out in 1991)
(4) Mr. Kapil Birthare, Director, Rankers Point (passed out in 1998)
(5) Dr. Atul Moghe, Deputy General Manager, Mylan Laboratories ltd. Hyderabad, (passed out in 1998)
(6) Mr. Kishore Malviya, Director, SMS Infrastructure Ltd., Nagpur (passed out in 1999)
(7) Dr. Ravi Sharma, Senior Research Scientist, Ranbaxy, Gurgaon (passed out in 2003)
(8) Dr Dipankar Nanda, Scientist, Raja Ramanna Centre for Advanced Technology, Department of Atomic Energy, Indore (passed out in 2004)
(9) Mr. Pushpendra Kushwaha, Asst. Commissioner, Co operative society, Govt. of M.P. (passed out in 2005)
(10) Dr. Nilesh Rane, Senior Application Scientist, Perkin Elmer Inc. Pune (passed out in 2007)

A.23 Details of student enrichment programmes (special lectures / workshops / seminar) involving external experts. (File No. CHEM-3)

(1) Organized National Level Seminar on 20th March 2012 and invited eminent scientist from the institutions of national repute including IITs and BITS, Pilani.
(2) Prof. R. M. Choksey was invited to deliver a lecture on **National Safety Day on March 4, 2013.**
(3) Special lectures on **"Fostering Excellence in Research"** organized on January 15, 2013. List of Speakers is as follows:
    (a) Prof. Priyankar Upadhyay UNESCO Chair Professor, Banaras Hindu University (BHU), Varanasi.
    (b) Prof. V. K. Singh, Director, Indian Institute of Science Education and Research (IISER), Bhopal.
    (c) Prof. H. Padh. Vice- Chancellor, Sardar Patel University, Vallabh Vidya Nagar, Gujarat.
(4) Workshop on Effective teaching and learning on May, 10, 2013.
(5) Lecture series on Mahamana Madan Mohan Malviya ji was held on 06/11/2012 and 11/12/2012 Dr.Karan Singh, Hon'ble Justice Shri Girdhar Malviya, and Mrs. Kanta Malviya were the speakers.
(6) Lecture on Swami Vivekanand's Contribution and Message to youth was held on Jan.12,2013
(7) Bharat Ratna Dr. A.P.J. Abdul Kalam's message to University and college students on June 12, 2013.
(8) Prof V.K. Jain, Head, Chemistry Division, Bhabha Atomic Research Centre (BARC), Mumbai delivered talk on "Peeping into Metal Catalyzed Reactions" on July, 12 2013.
(9) Dr. Alok Shrivastava, (Humboldt Fellow and DAAD Professor) Chemistry Department, Panjab University, Chanigarh delivered a special lecture on Nanoscience and Nanotechnology on July 22, 2013

A.24 Record and List of the teaching methods adopted by the faculty for different program

Teaching done through ICT (PowerPoint) and class room board teaching. Various methods adopted are Lecture methods, interactive class room teaching, quiz, assignments, seminars, Group discussions and activity based learning.

A.25 Record of Monitoring by the department ensures that programme objectives are constantly met and learning outcomes are monitored

- More emphasis is given to interpret spectral exercises, which is the unique feature of the School.
- Theoretical and practical knowledge of Instrumental Techniques, Interpretation of various types of spectra(Nuclear Magnetic Resonance (NMR) Electron Spin Resonance (ESR), Infrared (IR), Ultraviolet-Visible (UV-Visible), Mossbauer, Mass Spectrometry)
- Up-to -date knowledge of broad range of disciplines of chemical sciences and keen analytical mind cultivated in a challenging environment.
- Value addition to teaching-learning process by tutorials, assignment, project work, seminars and industrial visits shall be continued.
- School has computer lab and it is being used for the teaching of basic computer/programming skills as per the need of the course curriculum of M. Sc. courses.
- Day to day updating of experimental strategies for new practical exercise will be continued.

A.26 Details and Highlight of the participation of students and faculty in extension activities in the department:

Faculty members and Students of the School are involved in different extension activities. They have been actively engaged in promoting the cause of "inclusive higher education" at various opportunities such as visits to colleges, in and outside the domain of university. Many students from affiliated colleges approach our faculty members in getting their problems solved and in career path identification.

Students are encouraged to undertake plantation activity whole heartedly. They are also propagating the message of conserving the environment in different cross sections of society.

Dr.Pratibha Sharma,Professor of Chemistry ,has been working as the In-Charge of University Day Care Centre since June 2011.This has been an important extension activity for the University as a whole.

A.27 Details of "beyond syllabus scholarly activities" of the department.

(a) We are developing new current topics, such as reaction dynamics, quantum mechanics, and macro molecular chemistry with the objective of updating the syllabus in future.
(b) Teachers of the School supported the activities of Academic Staff College for running refresher courses
(c) Various activities of the University are supported by the faculty members
(d) Counseling of the students is done by the faculty members
(e) Weaker students are assisted by the faculty members
(f) Brilliants students are encouraged for NET preparation

A.28 Information about programme /department accreditation /grading by other agencies? If yes, give details

UGC team appreciated our department and we were rewarded by a big grant of Rs.50 Lakh. We were also appreciated by DST and were rewarded by FIST grant of Rs.38 lakh.

A.29 Write up of highlight the contributions of the department in generating new knowledge, basic or applied.

(1) The faculty of the School has been recognized both nationally and internationally for contributions to their specific disciplines and to maintain programmatic strengths in chemistry.

(2) We have developed new nano porous materials as catalyst for production of styrene which is a potential monomer. We have also developed generating transition state using Gaussian 09.

(3) The faculty is extremely well qualified and motivated with a strong commitment to research, which is reflected in the number of projects sponsored by Department of Science and Technology (DST) New Delhi, University Grants Commission (UGC) New Delhi, Council of Scientific and Industrial Research (CSIR) New Delhi, Defense Research and Development Organization (DRDO) New Delhi, MP council of Science and Technology (MPCST) Bhopal.

(4) School has strong connections through research collaborations.

(5) Faculty members served as referee to review research papers from national and international journals.

(6) Department has educated 1942 PG, 102 Ph.D., 02 D.Sc., since inception in 1976 who are serving the nation.

(7) Research contribution of faculty members has been widely acclaimed by the scientific community around the world and has appeared as new chapters in advanced textbooks and reference books.

List of Publications with Impact factors (2008-2013):

No. of Publication during **2008-13** in international journals = **104**.

1. Stretched σ-borane complexes of rhodium: A theoretical study
   K.K. Pandey
   Inorg. Chem. Commun. 11 (2008) 288
   Impact Factor: 1.972
2. σ-Borane complexes of nickel, palladium and platinum. A theoretical study
   K.K. Pandey
   J. Mol. Struct. (THEOCHEM) 855 (2008) 18
   Impact Factor: 1.288
3. Mixed-ligand Ru(II) complexes with 2,2'-bipyridine and tetradentate Schiff bases ligands: Synthesis, physico-chemical study, DFT analysis, electrochemical and Na binding properties
   L. Mishra, R. Prajapati, K.K. Pandey
   Spectrochimica Acta (A): Molecular and Bimolecular Spectroscoscopy 70 (2008) 79-85.
   Impact Factor: 1.952

4. Transition Metal sigma-borane complexes
   K.K. Pandey
   Coord. Chem. Revs. 253 (2009) 37
   Impact Factor: 12.110

5. Linear M≡E-Me Versus Bent M-E-Me: Bonding Analysis in Heavier Metal- ylidyne Complexes [(Cp)$(CO)_2$M≡EMe] and Metallo-ylidenes [(Cp)$(CO)_3$M-EMe] (M = Cr, Mo, W; E = Si, Ge, Sn, Pb)
   Krishna K. Pandey and Agustí Lledós
   Inorg. Chem. 48 (2009) 2748-2759.
   Impact Factor: 4.601

6. The Nature of M-B Versus M=B Bonds in Cationic Terminal Borylene Complexes: Structure and Energy Analysis in the Borylene Complexes $[(\eta^5\text{-}C_5H_5)(CO)_2M\{B(\eta^5\text{-}C_5Me_5)\}]^+$, $[(\eta^5\text{-}C_5H_5)(CO)_2M(BMes)]^+$, and $[(\eta^5\text{-}C_5H_5)(CO)_2M(BNMe_2)]^+$ (M = Fe, Ru, Os)
   Krishna K. Pandey, Agusti Lledos and Feliu Maseras
   Organometallics 28 (2009) 6442-6449.
   Impact Factor: 3.963

7. Structure and Bonding Energy Analysis of Cobalt, Rhodium and Iridium Borylene Complexes $[(\eta^5\text{-}C_5H_5)(CO)M(BNX_2)]$ (X = Me, SiH_3, $SiMe_3$) and $[(\eta^5\text{-}C_5H_5)(PMe_3)M\{BN(SiH_3)_2)]$ (M = Co, Rh, Ir)
   Krishna K. Pandey and Djamaladdin G. Musaev
   Organometallics 29 (2010) 142-148.
   Impact Factor: 3.963

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Impact factor 2.149

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Pratibha Sharma, Ashok Kumar and Vinita Sahu
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Prabal Bandyopadhyay , Lopamudra Guha, T. Seenivasagan, Manisha Sathe, Pratibha Sharma, B. D. Parashar, M. P. Kaushik
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Pratibha Sharma, Ashok Kumar. Siya Upadhyay, Jitendra Singh and Vinita Sahu
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93. Calix[n]arenes Mediated Phase Transfer Catalytic Synthesis of Purine Derivatives
Pratibha Sharma, Ashok Kumar, Vinita Sahu, and Jitendra Singh
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Impact factor 1.007

94. Synthesis and characterization of transitional metals (Cu, Co, Fe) complexes of 6-Methyl-5-Arylhydrazono-2-Thio-4-Oxo-Pyrimidine
Aushutosh Mishra, Ruchita Awate, Namrata Soni, Niyati Mishra, Ritu Soni and Pratibha Sharma
Phosphorus, Sulphur, Silicon and Related Elements, (Taylor &Francis), 184, 2624-2635 (2009)
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Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
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96. Frontier orbital interactions in the NDAC and IEDDAC Hetero Diels Alder cycloaddition of diazadienes
Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
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97. Diels Alder reaction strategy to synthesize 1, 2, 4, 5- tetrazines and exploration of their anti-inflammatory potential
Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
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Aushutosh Mishra, Pratibha Sharma, Namrata Soni, Ruchita Awate
Journal of Coordination Chemistry, (Taylor & Francis), 61(22), 3687–3692 (2008)
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Savita Khare, Rajendra Chokhare
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Impact Factor: 2.872

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S. V. Mahajan, Savita Khare and V.S. Shrivastava
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ISSN No : 09743049

102. Hazardous metals in pesticides industrial wastes and their correlation and regression,
S. V. Mahajan, Savita Khare and V.S. Shrivastava
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103. Spectrophotometric detection method of micro amount of nitrite in water samples.
Savita Khare and S.V. Mahajan
Journal of Environmental Research and Development, 3 (4) (2009) 1164
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104. Study of Manganese (II) supported Titanium Tungstate as catalyst for epoxidation of cyclohexene with dry TBHP.
Savita Khare and Rajendra Chokhare
Journal of Environmental Research and Development, 2(4) (2008) 537
ISSN No.: 0973-6921

A.30 Write up of Future plans of the department.

(1) Construction of separate building for applied chemistry and pharmaceutical chemistry.
(2) Creation of a few teaching posts for applied chemistry and pharmaceutical chemistry.
(3) Introduction of a few inter disciplinary courses such as stochastic theory of rates in syllabus.

A.31 Record of any five Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.

Strengths

(1) Active research groups in the fields of Nanomaterials, Catalysis, Organic/ Inorganic Synthesis, stochastic formulation of chemical reactions, and theoretical chemistry

(2) Provides high quality education and training for high flying careers in Chemical Sciences.

(3) Theoretical and practical knowledge of Instrumental Techniques, Interpretation of various types of spectra. Nuclear Magnetic Resonance (NMR) Electron, Spin Resonance (ESR), Infrared (IR), Ultraviolet-Visible (UV-Visible), Mossbauer, Mass Spectrometry

(4) Highly qualified and motivated internationally and nationally recognized faculty with a strong commitment to research.

(5) Credible approach for opportunity management for students through exhaustive support from faculty members and alumni.

Weaknesses

(1) In recent years, the availability of students with mathematics back-ground pursuing chemical sciences is very limited.

(2) Disparity in the intellectual levels of students so that learning group is indeed heterogeneous rather than composite.

(3) Inadequate infrastructure for overall academic activities

(4) Inadequate availability of support personnel for office work.

(5) Dependence on other institutes for sophisticated instrumental facility.

Opportunities

(1) New International and National level collaborations proposed to be undertaken in near future so as to enhance capacity building in knowledge creation

(2) Research skill and aptitude of the faculty and the students used for new innovations.

(3) Exploration of avenues for linkage of Science with Technology.

(4) Framing of a possible task group for feasibility evaluation of M. Tech. in emerging disciplines.

(5) Optimum use of flexibility approach to explore the unexplored domains so as to upgrade curriculum from time to time.

(6) Enhanced use of animation in class room lectures so as to build better bridge between teacher and the taught.

(7) To develop strong interface between the institute and industry.

Challenges

(1) New innovations and adaptability to emerging demands of sectors related to Chemical Sciences.

(2) Linkage of chemical sciences with technology so that excellence can be achieved at international level.

(3) Mobilization of knowledge creation with knowledge propagation.

(4) Overall upgradation of learning atmosphere for Chemistry in the entire University through enhanced interaction of University and College teachers.

(5) To develop prudent approach in the students taking NET and similar quality oriented competitive examinations.

A.32 Write up of efforts for Quality Sustenance and Assurance in the department.

(1) Periodical meetings, discussions and organization of seminars on the current topics in chemistry to sustain quality in chemical education.

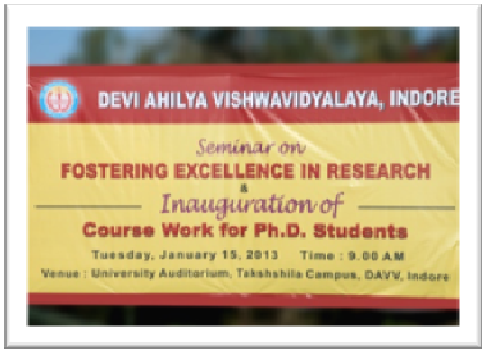
(2) Publications in top rated journals with high impact factor eg. JACS, Tetrahedron, Organometalics, Green Chemistry, Bioorganic Medicinal Chemistry.

(3) Multimedia projection systems are used in all class rooms. Power point Presentations are available on the web site, which helped faculty to communicate the subject objectives and planning to students

(4) Results are declared timely.

(5) Feedback from stakeholders regularly taken, analysed and monitored.

National Seminar on "Emerging trends in Chemical Sciences"- March 20, 2012



Seminar on "Fostering Excellence in Research" – January 15, 2013

Prof. R. M. Choukse delivering Lecture on National Safety Day- March 4, 2013

Prof. Vimal K. Jain, BARC, Mumbai, delivering a lecture -July 12, 2013

Induction Program for fresher students in the department-July 29, 2013

CRITERION I: Curriculum Design and Development

1.1.1 Academic Year of Revision, Curriculum of Each Course, Objective and Course plans of each paper taught in the course

Whether uploaded on website 2012 (File No. 1.1,1.2, and 1.3)

Yes [√] No [ ]

Year	Courses	Revision
2008-09	M.Sc.(Chemistry) M.Sc.(Applied Chemistry) M.Sc.(Pharma. Chemistry)	Faculty members reviewed the existing UGC course curriculum and no changes were suggested for this year.
2009-10	M.Sc.(Chemistry) M.Sc.(Applied Chemistry) M.Sc.(Pharma. Chemistry)	Faculty members reviewed the curriculum and appropriate changes were made in Laboratory exercises.
2010-11	M.Sc.(Chemistry) M.Sc.(Applied Chemistry) M.Sc.(Pharma. Chemistry)	A thorough exercise was done to restructure the overall course curriculum and it was planned to introduce these changes from the next academic session.
2011-12	M.Sc.(Chemistry) M.Sc.(Applied Chemistry) M.Sc.(Pharma. Chemistry)	In this academic session, the course curriculum has been thoroughly revised. Following major changes were carried out and implemented: • In all the M.Sc. courses instead of four theory papers pattern, number of papers has been increased to six-theory papers. • In M.Sc. III and IV semester course curriculum, four compulsory and two elective papers were introduced. • Theory paper of Solid State Chemistry and Photochemistry has been restructured and given the status of independent papers as MCH-302, MAP-302, MPC-302 -Photochemistry, MCH-401, MAP-401, MPC-401 - Solid State Chemistry. • Theory paper of Application of Spectroscopy was restructured and implemented as new papers: MCH-204, MAP-204, MPC-204 –Magnetic Resonance and Mossbauer Spectroscopy, MCH-301, MAP-301, MPC-301 – Molecular Spectroscopy (Organic). • Theory paper of Bioinorganic and Bioorganic Chemistry has been restructured and given the status

		of independent papers as MCH-304, MAP-304, MPC-304 - Bioinorganic Chemistry, MCH-404, MAP-404, MPC-404 - Bioorganic Chemistry. • Two new papers MCH-303, MAP-303, MPC-303 – ESCA and Diffraction Techniques, MCH-403, MAP-403, MPC-403 - Analytical Chemistry were introduced as compulsory papers in M.Sc III and IV Semesters, respectively. • Redesigning of laboratory experiments was carried out keeping in view the green chemistry aspects.
2012-13	M.Sc.(Chemistry) M.Sc.(Applied Chemistry) M.Sc.(Pharma. Chemistry) Ph. D. Course Work	• In this academic session students were encouraged to do their M.Sc. projects at departmental level. • In M.Sc. III semester practicals, experimental exercises pertaining to handling of instruments such as electronic, IR, GC, HPLC were introduced, in addition to theoretical interpretation of various spectra viz., IR, NMR, UV, Mass, Mossbauer, ESCA, ESR . • Syllabi of Research Methodology and Computer Applications were designed and introduced for Ph.D. Course work students.
2013-14	M.Sc.(Chemistry) M.Sc.(Applied Chemistry) M.Sc.(Pharma. Chemistry) Ph. D. Course Work	Faculty members have reviewed the course curriculum and suggested following revisions to be incorporated for the M.Sc. IV semester commencing from January 2014 : • A new elective paper entitled Physicoorganic Chemistry will be introduced as additional elective paper. • New topic on Nanomaterials will be introduced in the course curriculum of MCH-401, MAP-401, MPC-401 – Solid State Chemistry. Also, the nomenclature of this paper will be Solid State Chemistry and Material Science. A new topic on LASER Chemistry will be taught in the research methodology paper of Ph.D. Course work.

1.1.1.A Eligibility for admission to each course
50% minimum at U.G. Level and through Entrance examination

1.1.1.B Whether reflects Vision and mission reflection

Yes [√] No [ ]

Vision:
To create an academically sound environment that nurtures, motivates and inspires excellence in research and teaching in chemical sciences along with concern for society

Mission:
To impart theoretical and practical training in advanced areas of chemical Sciences and contribute new knowledge through research which encourages creativity, insight development and a passion for science

1.1.1C Write on reflection of vision and mission

The quality of teaching and research, international collaboration and publications reflect the vision and mission. The School has undertaken following activities to fulfil these goals and objectives:

(1) Rigorous teaching with teaching aids.
(2) Strong emphasis on research activities.
(3) Encouragement to the students to undertake challenging assignments.
(4) Seminar presentation by students.

The strength of the School has been and continues to be excellence in research and teaching. The faculty is extremely well qualified and motivated with a strong commitment to research.

1.1.2 Details of process followed in last revision of Curriculum

A. Need Assessment

(1) Statutory bodies bring the modifications in the curriculum from time to time.
(2) Curriculum of M.Sc. Chemistry, Applied Chemistry and Pharmaceutical Chemistry has been substantially revised for session 2011-12 and onwards. Recent revision has been carried out in August 2013.
(3) New experiments have been added from 2011-12.

B. Faculty involved in curriculum design (List of members)

(1) Dr. K.K. Pandey
(2) Dr. R. Prasad
(3) Dr. A.V. Bajaj
(4) Dr. Ashok Kumar
(5) Dr. H. P. S. Chauhan
(6) Dr. Mrs. Sheela Joshi
(7) Dr. Mrs. Pratibha Sharma
(8) Dr. Mrs. Savita Khare

C. Records of Departmental Committees/Board approvals of the designed curriculum: **Yes**
D. Records of External Experts Opinion of the designed curriculum: **Yes (File No. 1.6)**
E. Records of External Experts Feedback of the designed curriculum: **Yes (File No. 1.6)**
F. Records of Student Feedback opinion on the existing curriculum: **Yes (File No. 1.6)**
G. Records of Syllabi of National tests, Eligibility Tests and Examinations for example, GATE, NET, Service Commissions, National Councils, for the each curriculum, if any : Available as Ph. D. entrance Test Syllabus on University Website which is almost same as NET / GATE **(File No.1.4)**

1.1.3 Detailed write up for each course in reference to

Employability:

Faculty members guide the students for job opportunities in academic Institutions and Industries. Chemical Scientists have employability in many industrial and science laboratories.

Innovation:

Curriculum enables exploration of new horizons of knowledge in chemical sciences and to blend it effectively in academic curricula for overall educational purpose.

Research:

Advanced Topics are taught at PG level to prepare students for Research.

1.1.4 Records of UGC/AICTE/National Council, Regulating bodies Guidelines for the development and restructuring the curriculum, if any, N/A

1.1.5

A. Record of Interactions, Opinions and Feedbacks for the designed curriculum with External Research Bodies: **Interactions are regular features.**
B. Records of Interactions, Opinions and Feedbacks for the designed curriculum with Industrial Experts, particularly in case of Professional Courses: **Interactions are regular features.**
C. Records of Interactions, Opinions and Feedbacks for the designed curriculum with Stake Holders, such as eminent personalities, Visitors to the departments, parents: **Interactions are regular features.**
D. Records of Alumni opinion on the existing curriculum- **Available in Alumni Register. All the alumni gave excellent opinion about existing curriculum of department.**

Department refers to the opinion of external research bodies and Industry on regular basis in specific courses. Interaction is through e- mails and personal interactions. The department collects the suggestions/feedback from experts. The collected data and its feedback are analyzed.

S.No.	School/ Institute	Interaction and its impact
1.	Chemical Sciences	The department interacts with the stakeholders' viz., students, Pass-out graduates, Alumni, external academic/ industry experts for curriculum design and development. Their views on the designed curriculum, etc. were recorded in the Feedback Register. The following Academicians/Scientists/ Alumni visited the Department on different occasions. 1. Dr. V.K. Jain, Outstanding Scientist, BARC, Mumbai. 2. Prof. Alok Srivastava, Panjab University, Chandigarh. 3. Prof. R. S. Mali, Ex-V.C., North Maharashtra University, Jalgaon. 4. Mr. Pushpendra Kushwaha, Asst. Commissioner, Co operative society, Govt. of M.P. 5. Dr. Vinita Sahu, Asst. Prof., Alliance University Bengaluru. 6. Dr. Atul Moghe, Deputy General Manager, Mylan Laboratories ltd. Hyderabad. 7. Mr. Kishore Malviya, Director, SMS Infrastructure Ltd., Nagpur. 8. Ms. Trupti Kulkarni, Global Project Manager, Reckit Benkiser Pharmaceuticals, Richmond VA, USA 9. Dr. Rama Kant Shukla, Senior Vice –President, Jubilant Life Sciences, Noida 10. Dr. Mohd. Sadique, Director, Science Intermediary, Indore

1.1.6 List of Department Courses which are also introduced in University affiliated colleges also-

M.Sc. Chemistry and M.Sc. Pharmaceutical Chemistry

List of colleges who introduced those courses:

A. M.Sc. Pharmaceutical Chemistry

(1) Govt. Holkar Science College, Indore
(2) Christian Eminent Academy, Indore
(3) Maharaja Ranjit Singh College of Professional Sciences, Indore
(4) I.P.S. Academy, Indore
(5) Soft Vision College, Indore

B. M.Sc. Chemistry

22 Colleges affiliated to DAVV, Indore which run PG Chemical Sciences courses **(File No. 1.5)**

1.1.7Details of additional skill-oriented programmes designed for the colleges, Employees, Faculty relevant to regional needs:

(1) Ph. D. course work for Faculty of the colleges and Research scholars
(2) Faculty members encouraged to participate in seminars and conferences
(3) Non-teaching Staff encouraged for enhancing their computer skills

1.2 Academic Flexibility

1.2.1 List of Courses taught in Department on campus

- Overseas programmes offered on campus: **No**
- Programmes available for colleges to choose from: **Ph.D. Course Work**

1.2.2 Records on the following provisions with reference to academic flexibility

A. List of Core/ Elective options
The elective papers of the School are as follows-

(1) Medicinal Chemistry
(2) Analytical Chemistry
(3) Polymer
(4) Organic Synthesis
(5) Physico-Organic Chemistry

B. List of Enrichment courses- **Planned for 2013-14**.
C. List of Courses offered in modular form- **None**
D. List of courses/papers with Credit accumulation and transfer facility- **Planned for 2013-14.**
E. Details of Lateral and vertical mobility within and across programmes, courses and disciplines - **The ongoing academic programmes are periodically reviewed to assess the emergence of new avenues.**

S. No.	No. of Core Papers in each Course in four Semesters	Total Credits for Core Papers in each Course in all Semesters	No. of Elective/ Options Papers in each Course in four Semesters	Total Credits for Elective/ Options Papers in each Course in all Semesters
1.	20	60 credits	M.Sc. Chemistry-4 M.Sc. Applied Chemistry -4 M.Sc. Pharma Chemistry -4	12 Credits 12 Credits 12 Credits

S.No.	No. and credit of Interdepartmental or interdisciplinary courses Course in four Semesters	other Credits in four semesters
1.	3+3 Credits= 6 credits in two semesters	Practical 32 Credits and Comprehensive Viva Voce 16 Credits

S.No.	Course taught	Enrichment Courses
1.	M.Sc. Chemistry M.Sc. Applied Chemistry M.Sc. Pharma Chemistry	Material Science, Nanoscience, LASER Chemistry were introduced as enrichment courses. In addition to these, following enrichment courses were already there in course curriculum: 1. Computational Methods in Chemistry 2. Spectral Interpretation of unknown/synthesized compounds using various Spectroanalytical devices 3. Hands on training provided to the students for HPLC, GC, UV, IR, Colorimeter, Polarimeter 4. Laboratory skills development 5. Enrichment of Mathematics knowledge 6. Imparted training to qualify NET/GATE and other competitive exams

1.2.3 Records of International students: **No International student admitted.**

1.2.4 Records of Courses developed targeting international students, if any **N/A**

1.2.5 Record of dual degree and twinning programmes: **No dual degree programme**

1.2.6 A. List of students, Admission Process, Fee structure of each programme

Admission of the students done as per the notifications/guidelines of the university within the given time span. The process of admission comprises of entrance test followed by counseling. Fee structure is decided by University for every Academic session. Present academic session fee is as follows:

M.Sc. I Semester			M.Sc. II /III/ IV Semester		
	Boys	Girls		Boys	Girls
Student Service Fee (INR)	2260.00	2071.00	Student Service Fee	2260.00	2071.00
Academic Fee (INR)	4200.00	4200.00	Academic Fee	4200.00	4200.00
Caution Money(INR) (one time refundable)	1500.00	1500.00	--	--	--
Total Fee * (General) (INR)	**7960.00**	**7771.00**	**Total Fee**	**6460.00**	**6271.00**
Note: No Tuition Fee for Girls Students					

* SC/ST/OBC students are getting fee relaxation and scholarship as per official norms.

C. Record of Teacher qualification and salary parity and differences (if any) at par with the aided programmes:
Department is running an approved programme. There is no disparity in the salary of faculty members.

1.2.7 Operational details of distance Education Course in the department (if applicable) **N/A**

1.2.8 Details of Choice Based Credit System (CBCS)
Optional subjects are included in the curriculum for the convenience and benefits of the students. CBCS planned in XII plan.

1.2.9 Records of Departmental Academic Calendars of each semester
Available with the department and on University website: www.dauniv.ac.in
(File No.1.7)

1.2.10 Records of Inter-disciplinary programmes, Name of interdisciplinary program and details of students undertaken those programmes.
Interdisciplinary papers such as Mathematics for Chemists, Biology for Chemists, Bioinorganic Chemistry, Environmental Chemistry and Computer Applications have been included in all M.Sc. programmes.

1.3 Curriculum Enrichment

1.3.1 School updates M. Sc. syllabus from time to time. School is also upgrading the standard of research at Ph. D. level and has introduced course work as per UGC regulations.

1.3.2 Details of the last four years during which how many new programmes at UG and PG levels were introduced Inter-disciplinary:

Chemical Science	Interdisciplinary courses
	1. Mathematics for Chemists 2. Computers for Chemists 3. Biology for Chemists 4. Bioorganic Chemistry 5. Bioinorganic Chemistry 6. Environmental Chemistry
	Programmes in emerging areas
	1. Analytical Chemistry 2. Medicinal Chemistry 3. Organic Synthesis 4. Organometallic Chemistry 5. LASER Chemistry 6. Nanomaterials 7. Heterogeneous/Homogeneous Catalysis

1.3.3

A. Details of strategies adopted for the revision of the existing programmes

Course Plan is prepared after a long series of discussions with faculty members and getting inputs from stakeholders. School of Chemical Sciences has always adopted the philosophy of updating the curriculum time to time. As a result, new avenues of knowledge are incorporated and vibrant link is maintained with contemporary requirements. Recent updation of curriculum has been carried out on August 10, 2013.

B. Percentage of courses underwent a syllabus revision in last four years

(1) Existing Syllabi rigorously updated.

(2) Main focus of course curriculum is oriented to motivate the students to qualify NET/SLAT/GATE examination with ease.

(3) School course curriculum aspires the students to choose their career in industries or academic institutions.

1.3.4 A. Details of Value-added courses offered

Environmental Chemistry subject is added in the syllabus.

B. Details of these courses access to students

Environmental Chemistry subject is compulsory for all the students.

1.3.5 Details of higher order skill development programmes in consonance with the national requirements (for example, innovative M. Tech. /M.E. Courses, CCNA, CCSP…): **No**

1.4 Feedback System

1.4.1 A. Copy of Feedback form to obtain feedback from students/student class representatives regarding the curriculum: Available **(File No. 1.6)**

B. Details of action and use of on feedback from students

School of Chemical Sciences is taking feedback from the student for all the courses taught to them. The opinions of the students are either good or excellent. The range of feedback is from 2.6 to 3.8 in 4-point scale. All the faculty members are well educated and are excellent teachers. They teach the classes as per Time Table of the School and complete the courses during Time Schedule. Extra classes were taken by the some of the faculty members on Sundays in order to complete the courses.

1.4.2 A. Method used for eliciting feedback on the curriculum from national and international faculty: We have taken the feedback on the curriculam from external faculty members during their visit to the department on different occasions.

B. Conducting webinars-**Planned in 2013-14.**

C. Curriculum development Workshops-**Planned in 2013-14.**

D. Curriculum development online discussions-**Planned in 2013-14.**

E. Impact of Workshop and discussions- **Impact analysis will be undertaken after execution of these activities so as to give direction to further actions.**

1.4.3 Specify the mechanism through which affiliated institutions give feedback on curriculum enrichment and the extent to which it is made use of.

N/A

1.4.4 What is the quality sustenance and quality enhancement measure undertaken by the Department in ensuring the effective development of the curricula?

School of Chemical Sciences realizes the vitality of conversion of teaching into effective learning. Therefore, instead of traditional lecture method, faculty members are adopting innovative practices which design increased avenues for interaction with students.

During initial interaction with students, faculty members guide them to use e-resources as and when necessary. Consequently students mould themselves to become familiar with e-resources along with books & monographs. Students integrate e-resources in their seminar presentations and also in the assignments given by teachers.

Feedback from students and stakeholders is taken regularly. Grade Point Based Semester system is being followed since 1990.

Lectures of eminent personalities were organized at regular intervals.

Dr. APJ Abdul Kalam gave message to youth and inspired for dedicated work and global vision on June 12, 2013.

1.4.5 Any other information regarding Curricular Aspects which the UTD would like to include.

Activity oriented learning proposed in new academic session so as to invoke creativity in academic aspects.

CRITERION II: TEACHING-LEARNING AND EVALUATION

2.1 Student Enrolment and Profile

2.1.1 Copy of Advertisements and website info for ensuring publicity and transparency in the admission process **(File 2.1)**

2.1.2 A. Write up details of the process of admission put in place by the department

Admission of the students is being done as per the notifications/guidelines of the university within the given time span.

B. List of the criteria for admission: (*e.g.*: (i) merit, (ii) merit with entrance test, (iii) merit entrance test and interview, (iv) common entrance test conducted by state agencies and national agencies (v) other criteria followed

The process of admission comprises of entrance test followed by counseling.

2.1.3 Details of admission process in the affiliated colleges if department is monitoring the same **N/A**

2.1.4 Student profile analysis

Students from outside States are admitted after getting eligibility certificate provided by University.

2.1.5 Strategies adopted to increase/improve access for students belonging to the following categories:

(1) SC/ST
(2) OBC
(3) Women
(4) Persons with varied disabilities
(5) Economically weaker sections
(6) Outstanding achievers in sports and other extracurricular activities

Students are admitted strictly as per state Government Rules provided by Higher Education, Bhopal.

2.1.6 Number of students admitted in department in the last four academic years:

Categories	**Year 1 2009-10**		**Year 2 2010-11**		**Year 3 2011-12**		**Year 4 2012-13**	
	Male	Female	Male	Female	Male	Female	Male	Female
SC	06	05	04	07	08	02	07	06
ST	11	00	07	02	06	05	10	03
OBC	07	03	08	09	08	03	05	08
General	09	16	05	12	11	13	10	10
Total	33	24	24	30	33	23	32	27

2.1.7

A. Record of demand ratio for the various programmes of the university departments: About 350 applications are received for intake of 60 students.

B.

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG	-	-	-
PG	350	59	~6:1
Ph.D.	277	36	~8:1

B. If yes then highlight the significant trends explaining the reasons for increase/decrease.
Justification for increase in DR – For intake of 60 students, total 350 applications were received which clearly indicates the inclination of candidates towards Chemistry discipline.

2.1.8 A. Record of any programme discontinued/staggered in the last four years?
B. If yes, write-up of the reasons. **No**

2.1.9 Record of Admissions: **Admitted thorough CET-2012 for M.Sc. and DET for Ph.D**

Programmes	Total Number of admissions	Number of 1st division pass students in qualifying	Number of 2nd division pass students in qualifying	Entrance test Marks% (Min)
UG		NA	NA	NA
PG	59	54	5	Not Known
Ph.D.	36	34	2	40

2.2 Catering to Diverse Needs of Students

2.2.1 A. Record of organization of orientation/ induction programme for fresher

(1) **Induction programme organized on 25-8-12 and an oath was also administrated to all students of University**
(2) **Clear instructions are given to the students regarding discipline and academic curriculum of the school in orientation programme.**
(3) **This year an induction program was organized on July 29, 2013.**
(4) **A get together for the newly admitted students and senior students was arranged by the school in the presence of faculty members after the completion of admissions. Clear instructions are given to the students regarding ragging and the academic curriculum of the school.**
(5) **A University level induction programme was organized for all the freshers on September 11,2013.**

B. Details such as the duration, issues covered, experts involved and mechanism for using the feedback in subsequent years.

Feedback forms filled by the students are analysed by departmental committee. Corrective action is taken.

2.2.2 A. Record of analysis of the "differential requirements of the student population" after admission and before the commencement of classes

Students have variable levels of learning and therefore constant interaction is maintained with them to ensure conversion of teaching into learning.

Analysis showed that computer literacy of several students is not upto the mark. Further, there is great deficiency with respect to soft skills in certain segments of the students.

C. Record of key issues identified and addressed

Facilities are arranged as per the differential requirement of computer skills and software skills.

2.2.3 A. Record of bridge/remedial/ add-on courses

(1) Counseling of the students is done by the faculty members
(2) Weaker students are assisted by the faculty members
(3) Brilliants students are encouraged for NET preparation
(4) Remedial classes for students- **Planned for 2013-14.**

D. Time table and details of the courses offered in the department-wise for all courses

Time table and Syllabus are provided to the admitted students and placed on website.

2.2.4 A. Record of the academic growth of students from disadvantaged sections of society, economically disadvantaged, physically handicapped, slow learners, etc

Year	**Course**	**No. of Students passed with A and A+ grades**			**Total no. of students**		
		SC	ST	OBC	SC	ST	OBC
2011-2013	M.Sc.	NIL	NIL	NIL	05	04	10
2010-2012	M.Sc.	NIL	NIL	NIL	06	05	14
2009-2011	M.Sc.	NIL	NIL	NIL	06	02	10

B. Main findings?

Weaker students are assisted by the faculty members.

2.2.5 Record of identification and responses to the learning needs have advanced learners:

Brilliants students are encouraged for NET preparation. They also associate with research groups.

2.3 Teaching-Learning Process

2.3.1 Records of Plan and organisation of the teaching, learning and evaluation schedules (teaching plan, evaluation schedules and methods, etc.)

The time table of teaching schedule is declared latest by 5th July for the Odd Semester and by 5th January for even semester. The mid-term tests and end semester examination are conducted as per semester schedule. Annual results are declared before 30th May.

2.3.2 A. Record and website of providing course outlines and course schedules prior to the commencement of the academic session

Course plan and syllabi of all M.Sc. courses is uploaded on university website.

B. Methods used for effective implementation

Monitoring by Departmental Committee for strict adherence to departmental academic calendar.

2.3.3 A. Record of difficulties in completing the curriculum within the stipulated time frame and calendar:

None

B. Write up of the challenges encountered and the departmental measures to overcome these.

N/A

2.3.4 A. Record of student-centric learning activities

B. List of participatory learning activities which are adopted by the faculty that contributes to holistic development and improved student learning, besides facilitating life-long learning and knowledge management.

Novel methods of learning for example, projection of video lectures and web-Tutorials are the new student- centric methods adopted.

2.3.5 List, record with photographs of activities such as invited experts/people of eminence to deliver lectures and/or organize seminars for students (**File 2.3.5)**

(1) The school successfully organized a National Seminar on the theme entitled **"Emerging Trends in Chemical Sciences" in** 2012 and academic fraternity of entire University was benefited by this exercise. Students and Faculty members have interacted with eminent scientists.

i) Prof. B. Vishwanathan, IIT Madras
ii) Prof. Deepak Gupta, IIT Kanpur
iii) Prof. P. Yogeeshwari, BITS Pilani, Hyderabad
iv) Prof. Akhilesh Verma, University of Delhi

(2) School organized a lecture on March 4, 2013 on the occasion of National Safety Day in the department. Prof. R. M. Choukse delivered his lecture on "Safety Measures".

(3) Prof V.K. Jain, Head, Chemistry Division, Bhabha Atomic Research Centre (BARC), Mumbai delivered talk on "Peeping into Metal Catalyzing Reactions" on July, 12 2013.

(4) Prof. Alok Srivastava, Panjab University, Chandigarh, delieveredlecture on " Nano Science and Nano Technology" on July 22, 2013. .

2.3.6 Record of Encouragement to blended learning by using e-learning resources

Faculty blends e-learning resources in their PowerPoint presentations during lectures and takes help from web tutorials also. Record of facilities such as virtual laboratories, e-learning, open educational resources and mobile education used by the faculty for effective teaching networking facility through IT center has been provided to facilitate teaching and research. Virtual classroom planned in 2013-14.

A. Record of actions taken to avail the services of counsellors/mentors/advisors for each class or group of students for academic, personal and psycho-social guidance

(1) Seminar of the students is arranged once in a week.
(2) Mentors have been appointed for a group of 20 students. Mentors are appointed to look after the students problems. Faculty members for different courses are as follows:

Mentor	**Course**
Dr. A. V. Bajaj	M. Sc. Chemistry (1st sem.)
Dr. A. Kumar	M. Sc. Applied Chemistry (1st sem.)
Dr. H.P.S. Chauhan	M. Sc. Pharmaceutical Chemistry (1st sem.)
Dr. Pratibha Sharma	M. Sc. Chemistry (3rd sem.)
Dr. S. Khare	M. Sc. Applied Chemistry (3rd sem.)
Dr. Sheela Joshi	M. Sc. Pharmaceutical Chemistry (3rd sem.)

(3) Psychometric Counseling planned for 2013-14.

B. Details of the process and the number of students who have benefitted.
The students are encouraged to use advanced multimedia devices to present their project work/ seminars.

C. Record of recognition to the faculty due recognition for innovation in teaching
Various innovative practices are adopted by faculty to ensure thorough learning and capacity building.

D. Record of actions for creating e a culture of instilling and nurturing creativity and scientific temper among the learners
Good atmosphere is provided to the students with a view to nurture creativity in them. The students were motivated to take part in different scientific seminars /conferences. This instills scientific temper in them.

2.3.7 Record of Student feedback for evaluation of teachers by the students
Student's feedback was analyzed. Overall rating of the faculty members was very good. Evaluation is hosted on IQAC website.

2.3.13 Percentages of the students doing in-house and external projects vary from department to department. The following is the common analysis.

A. Number of projects executed within the university- **14**

B. Names of external institutions associated with the university for student project work
Students have done their project work from following institutes of repute in last five years:

1. National Chemical Laboratory (NCL), Pune
2. Indian Institute of Chemical Technology (IICT), Hyderabad
3. Indian Institute of Technology(IIT),New Delhi
4. Central Salt and Marine Chemicals Research Institute(CSMCRI), Bhavnagar
5. Ranbaxy, Dewas
6. Cipla, Indore
7. North-East Institute of Science and Technology, RRL- CSIR, Jorhat, Assam
8. Indian Institute of Science, Bangalore
9. IPCA Pharmaceutical, Indore

10. IPCA Pharmaceutical, Ratlam
11. UGC-DAE CSR, DAVV Campus
12. Reliance Industries Limited Petrochemical Baroda(Gujarat)
13. Nicholas- Piramal Healthcare, Indore
14. Department of Chemistry, University of Delhi
15. Cadila Pharma Ahemdabad(Gujarat)
16. RRL(AMPRI-CSIR),Bhopal
17. Maulana Azad Natinal Institute of Technology(MANIT), Bhopal
18. Bhabha Atomic Research Centre, Trombay,Mumbai
19. Institute of Animal Health and Veternary Biological Research Centre Mhow(M.P.)
20. Dr. Reddy's Laboratories, Hyderabad

C. Role of faculty in facilitating such projects

Faculty members guide the students to choose the institutions of repute for their project work. They recommend the names of the students to various Scientific Institutions/ Industries using their own contacts, wherever needed.

2.4 Teacher Quality

2.4.1 Record of how the plan and management of human resources was done to meet the changing requirements of the curriculum

Diversity in expertise of teachers ensures appropriate quality inputs with ability to face probing questions and to meet the changing requirements of the curriculum.

2.4.2 School has undertaken following activities to fulfill these goals and objective:

- Rigorous teaching with teaching adds.
- Strong emphasis on research activities.
- Encouragement to the students to undertake challenging assignments.
- Seminar presentation by students.

2.4.3 Diversity in its faculty recruitment

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Chemical Sciences	2 out of 8 25 %	2 out of 8 25%	4out of 8 50%	none

2.4.4

A. List of qualified faculty appointed for new programmes/emerging areas of study (Bio-technology, Bio-informatics, Material Science, Nanotechnology, Comparative Media Studies, Information Technology, Diaspora Studies, Forensic Computing, Educational Leadership, etc.)?

(1) Dr. Prasad is guiding Ph D students in the fields of Bio-informatics, Material Science, Nanotechnology.

(2) Number of faculty members appointed to teach new programmes during the last four years- **Expertise already available.**

2.4.5 List of academic recharge and rejuvenation of teachers

A. List of faculty availed and provided research grants by the University: **Planned in 2013-14**

B. List of faculty availed and on study leave: **Two**

(i)Prof. K. K. Pandey

Alexander von Humboldt Fellow, Germany	(July, 2010- September, 2010) (University of Wurzburg, Germany) (August, 2011- October, 2011) (University of Marburg, Germany)
Visiting Professor, Departament de Quimica, Universidad Autonoma de Barcelona, Spain	May, 2008- June, 2008
Emerson Fellow, Emerson Centre for Scientific Computation, Emory University, USA	July, 2008- September, 2008
Visiting Professor, Departament de Quimica, Universidad Autonoma de Barcelona, Spain	May, 2009
Institute of Chemical Research of Catonia (ICIQ), Tarragona, Spain	June, 2009- July, 2009
Emerson Fellow, Emerson Centre for Scientific Computation, Emory University, USA	August, 2009- October, 2009

(ii)Prof. Ashok Kumar

Nov.10, 2008 – Feb.9, 2009	Visited University of Pecs, Hungary under Indo-Hungarian Exchange Program

C. List of faculty nominated to national/international conferences/seminars, in-service training, organizing national/international conferences etc.

(1) Dr Ashok Kumar has received Indo –Hungarian research fellowship and visited University of Pecs, Hungary during Nov. 10, 2008 to Feb.9, 2009.

(2) Prof. Ashok Kumar and Prof. Pratibha Sharma visited Keio University,Japan in context of an international conference in Nov.2011 and presented their papers .

(3) Prof. Pratibha Sharma has deliverd an invited talk and chaired a session in International coference held at Gurukul Kangri University,Haridwar during Feb.11-14,2012

(4) Prof. H. P. S. Chauhan was elected Zonal Secretary (2008-2011} and Vice President (2011-2014) 0f Central Zone of Indian Council of Chemists.

(5) Prof. H. P. S. Chauhan was Sectional President of Inorganic Chemistry Section at the 31st annual conference of Indian Council of Chemists held at the Department of Chemistry, Saurashtra University, Rajkot during 26-28 Dec.,2012

(6) Prof. H. P. S. Chauhan delivered Sectional President's Address entitled "Chemistry of some Group 15 metal Complexes with mixed Sulphur Ligands" at Indian Council of Chemists, 2012

(7) Prof. H. P. S. Chauhan delivered invited lectures and chaired one session at:

a) Indian Council of Chemists, 2011, Hyderabad
b) Indian Council of Chemists, 2010, Chandigarh, T. N. Srivastava memorial lecture
c) Indian Council of Chemists, 2009, Patan.
d) National conference, 2010, Aligarh
e) National Seminar, 2011, A.P.S. University, Rewa.

2.4.7 List of faculty received awards / recognitions for excellence in teaching at the state, national and international level during the last four years

None

2.4.8 List of faculty underwent staff development programmes during the last four years (add any other programme if necessary)?

Academic Staff Development Programmes	**Number of faculty**
Refresher courses	None
Orientation programmes	None

2.4.9 Percentage of the faculty has been -

- invited resource persons in Workshops / Seminars / Conferences organized by external professional agencies = 25 %
- participated in external Workshops / Seminars / Conferences recognized by national/ international professional bodies = 25 %
- presented papers in Workshops / Seminars / Conferences conducted or recognized by professional agencies = 25 %
- teaching experience in other universities / national institutions and other institutions = No
- Industrial engagement: No
- International experience in teaching: Prof. Pratibha Sharma has taught BS and MS students of chemistry at University of Pecs, Hungary during Nov.10-29, 2008.

2.4.10 List and details of organization of academic development programmes (*e.g.*: curriculum development, teaching-learning methods, examination reforms, content / knowledge management, etc.) for its faculty aimed at enriching the teaching-learning process

Refresher courses in chemistry were conducted with the support of ASC, DAVV, Indore as per planned schedule.

2.4.11 A. List of faculty encouraged:

Mobility of faculty between universities for teaching
Faculty exchange programmes with national and international bodies

E. Record of schemes helping in enriching the quality of the faculty by such mobility and faculty exchanges

None

2.5 Evaluation Process and Reforms

2.5.1 A. Record of time taken by the department for declaration of examination results each Semester

- The midterm tests and end semester examination are done as per semester schedule Test results and end semester results are declared within two weeks. Annual results are declared before 30th Dec and 30th May for Odd and even semesters, respectively.

B. Record of means adopted for the mode / media adopted for the publication of examination results (Website, SMS, email, etc.)

Displayed on Board and at website

2.5.2 A. Record of ensuring transparency in the evaluation process

Semester system is followed in its true spirit. Answer sheets are shown to the students after evaluation. Students also showed test answers.

B. Measures taken to ensure confidentiality

Exam of each semester is conducted as per Ordinance 31 of University. Paper is set by the faculty which teaches the concerned subject. The paper is opened 10 minutes before the examination.

C. Record of the Pre-examination processes – Examination Time table generation, student list generation, Invigilators, Attendance sheet

Maintained for each semester examination

D. Results of students course wise and its analysis

Result is satisfactory and up to-mark. (As evidenced by feedback taken at end semester Exam)

2.6. Student Performance and Learning Outcomes and use it for overcoming barriers to learning

School's mission is to provide high quality education and training for high flying careers in Chemical Sciences. Our distinguishing features are:

- Theoretical and practical knowledge of Instrumental Techniques.
- Interpretation of various types of spectra. Nuclear Magnetic Resonance (NMR) Electron Spin Resonance (ESR), Infrared (IR), Ultraviolet-Visible (UV-Visible), Mössbauer, Mass Spectrometry
- The strength of the School has been and continues to be excellence in research and teaching.
- The faculty is extremely well qualified and motivated with a strong commitment to research.

CRITERION III: RESEARCH, CONSULTANCY AND EXTENSION

III.1 Year-wises Publications of the department:

1. Stretched σ-borane complexes of rhodium: A theoretical study
   K.K. Pandey
   Inorg. Chem. Commun. 11 (2008) 288.
   Impact Factor: 1.972

2. σ-Borane complexes of nickel, palladium and platinum. A theoretical study
   K.K. Pandey
   J. Mol. Struct. (THEOCHEM) 855 (2008) 18.
   Impact Factor: 1.288

3. Mixed-ligand Ru(II) complexes with 2,2'-bipyridine and tetradentate Schiff bases ligands: Synthesis, physico-chemical study, DFT analysis, electrochemical and Na binding properties
   L. Mishra, R. Prajapati, K.K. Pandey
   Spectrochimica Acta (A): Molecular and Bimolecular Spectroscoscopy 70 (2008) 79-85.
   Impact Factor: 1.952

4. Transition Metal sigma-borane complexes
   K.K. Pandey
   Coord. Chem. Revs. 253 (2009) 37.
   Impact Factor: 12.110

5. Linear M≡E-Me Versus Bent M-E-Me: Bonding Analysis in Heavier Metal- ylidyne Complexes $[(Cp)(CO)_2M{\equiv}EMe]$ and Metallo-ylidenes $[(Cp)(CO)_3M\text{-}EMe]$ (M = Cr, Mo, W; E = Si, Ge, Sn, Pb)
   Krishna K. Pandey and Agustí Lledós
   Inorg. Chem. 48 (2009) 2748-2759.
   Impact Factor: 4.601

6. The Nature of M-B Versus M=B Bonds in Cationic Terminal Borylene Complexes: Structure and Energy Analysis in the Borylene Complexes $[(\eta^5\text{-}C_5H_5)(CO)_2M\{B(\eta^5\text{-}C_5Me_5)\}]^+$, $[(\eta^5\text{-}C_5H_5)(CO)_2M(BMes)]^+$, and $[(\eta^5\text{-}C_5H_5)(CO)_2M(BNMe_2)]^+$ (M = Fe, Ru, Os)
   Krishna K. Pandey, Agusti Lledos and Feliu Maseras
   Organometallics 28 (2009) 6442-6449.
   Impact Factor: 3.963

7. Structure and Bonding Energy Analysis of Cobalt, Rhodium and Iridium Borylene Complexes $[(\eta^5\text{-}C_5H_5)(CO)M(BNX_2)]$ (X = Me, SiH_3, $SiMe_3$) and $[(\eta^5\text{-}C_5H_5)(PMe_3)M\{BN(SiH_3)_2\}]$ (M = Co, Rh, Ir)
   Krishna K. Pandey and Djamaladdin G. Musaev
   Organometallics 29 (2010) 142-148.
   Impact Factor: 3.963

8. Linear versus bent bonding in metal-phosphinidene complexes: Theoretical studies of the electrophilic phosphinidene complexes $[(\eta^5\text{-}C_5H_5)(CO)_2M(PMe)]^+$, $[(\eta^5\text{-}C_5H_5)(CO)_3M(PMe)]^+$ (M = Cr, Mo, W)
   Krishna K. Pandey and Agusti Lledos
   J. Organomet. Chem. 695 (2010) 206-214.
   Impact Factor: 2.384

9. Computational Studies of Transition Metal Selectivity of Octapeptide Repeat Region of Prion Protein (PrP)
   Krishna K. Pandey, James P. Snyder, Dennis C. Liotta and Djamaladdin G. Musaev
   J. Phys. Chem. A 114 (2010) 1127-1135.
   Impact Factor: 2.946

10. New ruthenium(II) thiolato complexes: Synthesis, reactivity, spectral, structural and DFT studies
    Sudhakar D. Dwivedi, Santosh K. Dubey, Ashish K. Singh, Krishna K. Pandey and Daya S. Pandey
    Inorg. Chim. Acta 363 (2010) 2095-2103.
    Impact Factor: 1.846

11. Structure and Bonding Energy Analysis of M-Ga Bonds in Dihalogallyl Complexes Trans-$[X(PMe_3)_2M(GaX_2)]$ (M = Ni, Pd, Pt; X = Cl, Br, I)
    Krishna K. Pandey, Pankaj Patidar, Holger Braunschweig
    Inorg. Chem. 49 (2010) 6994-7000.
    Impact Factor: 4.601

12. Nature of M-Ga Bonds in Dihalogallyl Complexes $(\eta^5\text{-}C_5H_5)(Me_3P)_2M(GaX_2)$ (M = Fe, Ru, Os) and $(\eta^5\text{-}C_5H_5)(OC)_2M(GaX_2)$ (X = Cl, Br, I): A DFT Study
    Krishna K. Pandey, Pankaj Patidar, Simon Aldridge
    J. Phys. Chem. A 114, 2010, 12099-12105.
    Impact Factor: 2.946

13. Nature of Bonding in Terminal Borylene, Alylene and Gallylene complexes of Vanadium and Niobium $[(\eta^5\text{-}C_5H_5)(CO)_3M(ENR_2)]$ (M = V, Nb; E = B, Al, Ga; R = CH_3, SiH_3, CMe_3, $SiMe_3$): A DFT Study
    Krishna K. Pandey, Holger Braunschweig, Agusti. Lledós
    Inorg. Chem. 50 (2011) 1402-1410.
    Impact Factor: 4.601

14. DFT Study on the Alkylborylene and Haloborylene Complexes of Manganese and Rhenium: Structure and Bonding Energy Analysis in $[(\eta^5\text{-}C_5H_5)(CO)_2M(BR)]$ and $[(\eta^5\text{-}C_5H_5)(CO)_2M(BX)]$ (M = Mn, Re; R = Me, Et, iPr, tBu; X = F, Cl, Br, I)
    Krishna K. Pandey, Holger Braunschweig, Rian D. Dewhurst
    Eur. J. Inorg. Chem. 2011, 2045-2056
    Impact Factor: 3.049

15. Unexpected Generation of Diastereomers by Double Diboration of a Dialkyne
F. Bauer, H. Braunschweig, K. Gruß, Christoph Lambert, Krishna K. Pandey, K. Radacki, D. Reitzenstein
Chem.Eur.J.17(2011)5230-5233.
Impact Factor: 5.925

16. Nature of M-Ga Bonds in Cationic Metal-Gallylene Complexes of Iron, Ruthenium and Osmium $[(\eta^5\text{-}C_5H_5)(L)_2M(GaX)]^+$. A Theoretical Study
Krishna K. Pandey, Simon Aldridge
Inorg. Chem. 50 (2011) 1798-1807.
Impact Factor: 4.601

17. Nature of M-Bi bonds in dihalobismuth complexes of nickel, palladium and platinum trans-$[X(PMe_3)M(BiX_2)]$ (M = Ni, Pd, Pt; X = Cl, Br, I)
Krishna K. Pandey
Comput. Theoret. Chem. 967 (2011) 140-146.
Impact Factor: 1.288

18. Nature of M-E bonds in metallosilylenes, germylenes, stannylenes and plumbylenes $[(\eta^5\text{-}C_5H_5)(Me_3P)(H)_2M(EPh)]$ (M = Fe, Ru, Os; E = Si, Ge, Sn, Pb)
Krishna K. Pandey, Philip P. Power
Organometallics 30 (2011) 3353-3361
Impact Factor: 3.963

19. Structure and bonding energy analysis of cationic metal-ylyne complexes of molybdenum and tungsten $[(MeCN)(PMe_3)_4M{\equiv}EMes]^+$ (M = Mo, W; E = Si, Ge, Sn, Pb): A Theoretical Study
Krishna K. Pandey, Pankaj Patidar, Philip P. Power
Inorg. Chem. 50 (2011) 7080-7089
Impact Factor: 4.601

20. Structure and bonding analysis of dimethylgallyl complexes of iron, ruthenium and osmium $[(\eta^5\text{-}C_5H_5)(CO)_2M(GaMe_2)]$ and $[(\eta^5\text{-}C_5H_5)(Me_3P)_2M(GaMe_2)]$
Krishna K. Pandey
J. Phys. Chem. A 115 (2011) 8578-8585.
Impact Factor: 2.946

21. Structure and bonding in haloarylgallyl complexes of iron, ruthenium and osmium $[(\eta^5\text{-}C_5H_5)(CO)_2M\{Ga(X)(Ph)\}]$: A theoretical study
Krishna K. Pandey, Pankaj Patidar
J. Organomet. Chem. 696 (2011) 3536-3542.
Impact Factor: 2.384

22. Bis(borylene) Complexes of Cobalt, Rhodium, and Iridium $[(\eta^5\text{-}C_5H_5)M(BNX_2)_2]$ (X = Me, SiH_3, $SiMe_3$): A Bonding Analysis
Krishna K. Pandey
Organometallics 30 (2011) 5851- 5858.
Impact Factor: 3.963

23. Structure and bonding analysis of dihalogallyl and dimethylgallyl complexes of molybdenum and tungsten $[(\eta^5\text{-}C_5H_5)(CO)_3M(GaX_2)]$ (M = Mo, W; X = Cl, Br, I, Me): A Theoretical Study
    Krishna K. Pandey
    Comput. Theoret. Chem. 973 (2011) 13-19.
    Impact Factor: 1.288

24. The nature of M-Ga in metal(I) gallyl complexes of copper, silver and gold: A Theoretical study
    Krishna K. Pandey
    J. Organomet. Chem. 701 (2012) 75-79
    Impact Factor: 2.384

25. Theoretical investigation of M≡E bonds in transition metaleylidyne complexes trans-$[H(PMe_3)_4M{\equiv}ER]$ (M = Mo, W; E = Si, Ge, Sn, Pb; R = Mes, Xylyl)
    Krishna K. Pandey, Pankaj Patidar
    J. Organomet. Chem. 702 (2012) 59-66
    Impact Factor: 2.384

26. Structure and bonding analysis in dihalobismuth complexes of iron, ruthenium and osmium $[(\eta^5\text{-}C_5H_5)(CO)_2M(BiX_2)]$: A theoretical Study
    Krishna K. Pandey, Pankaj Patidar, Pradeep Tiwari
    Polyhedron 34 (2012) 84-91.
    Impact Factor: 2.057

27. What is the best bonding model of the (σ-H-BR) species bound to a transition metal: Bonding analysis in complexes $[(H)_2Cl(PMe_3)_2M(\sigma\text{-}H\text{-}BR)]$ (M = Fe, Ru, Os)
    Krishna K. Pandey
    Dalton Trans. 41 (2012) 3278-3286.
    Impact Factor: 3.840

28. Structure and bonding analysis of dimethylgallyl complexes of cobalt, rhodium and Iridium $[Me(PMe_3)_2(Me_3GaCl)M(GaMe_2)]$ (M = Co, Rh, Ir) and $[Me(PMe_3)_2ClIr(GaMe_2)]$: A theoretical study
    Krishna K. Pandey
    J. Organomet. Chem. 710 (2012) 6-11.
    Impact Factor: 2.384

29. Theoretical investigation of triple bond in molybdenum complexes trans-$[X(PMe_3)_4Mo{\equiv}E(Mes)]$ (X = F, Cl, Br, I; E = Si, Ge, Sn, Pb): A DFT study
    Krishna K. Pandey, Pankaj Patidar
    Polyhedron 37 (2012) 85-93.
    Impact Factor: 2.057

30. A theoretical study of the bonding and charge distribution in cationic group 8 metal borylene and alylene complexes: Consequences for complex stability and reactivity
    Krishna K. Pandey
    Polyhedron, 43 (2012) 131-139.
    Impact Factor: 2.057

31. The Nature of Mo≡E Bonds: Structure and Bonding Analysis of the Molybdenum-Ylidyne Complexes Trans-[X(dmpe)$_2$Mo≡E(η^1-C_5H_5)] (E = Si, Ge, Sn, Pb; X = H, Cl, Br, I, CN)
Krishna K. Pandey, Pankaj Patidar, Alexander C. Filippou
Inorg. Chem. 2012 Accepted.
Impact Factor: 4.601

32. Bonding energy analysis in cationic borylene complexes of palladium and platinum: A theoretical study
Krishna. K. Pandey
Polyhedron 52 (2013) 1431-1439.
Impact Factor: 2.057

33. Nature of M-(η^2-H-SiR_2) in chromium, molybdenum and tungsten complexes [(η^2-C_5H_5)(dmpe)M(η^2-H-SiR_2)] and [(η^2-C_5H_5)(CO)$_2$M(η^2-H-SiR_2)]: A theoretical study
Krishna K. Pandey
Polyhedron 55(2013) 241-248
Impact Factor: 2.057

34. Nature of M–Ge Bonds in the Metallogermylene Complexes of Chromium, Molybdenum, and Tungsten [(η^5-C_5H_5)(CO)$_3$M{GeN($SiMe_3$)R}] and [(η^5-C_5H_5)(CO)$_3$M{GeN(Ph)R}] (R = Ph, Mesityl (Mes)): A Theoretical Study
Krishna K. Pandey and Cameron Jones
Organometallics 32 (2013) 3395-3403
Impact Factor: 3.963

35. Bonding analysis of the neutral electrophilic phosphinidene complexes of vanadium and niobium [(η^5-C_5H_5)(CO)$_3$M(PNR_2)] (R = Me, ^{i}Pr, ^{t}Bu): A DFT study
Krishna K. Pandey, Pradeep Tiwari, Pankaj Patidar
J. Organomet. Chem. 740 (2013) 135-140.
Impact Factor: 2.384

36. Accurate theoretical description of the M-PNR_2 bonds in phosphinidene complexes of manganese and rhenium [$(CO)_5$M-PNR_2]$^+$ (R = Me, ^{i}Pr, ^{t}Bu) and [$(PMe_3)(CO)_4$M-PN^iPr_2]$^+$: A DFT-D3 study
Krishna K. Pandey, Pradeep Tiwari, Pankaj Patidar, Sunil K. Patidar, Ravi Vishwakarma and Pankaj K. Bariya
J. Organomet. Chem., (2013) In Press
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Prabhakar Sharma, Reena Dwivedi, Rajiv Dixit and Rajendra Prasad
Ind. Eng. Chem. Res. (2013) DOI 10.1021/ie400745x
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Journal of Nanoparticles (2013), Article ID 737831,
Impact Factor: 1.546

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    Mukesh C. Sharma, Smita Sharma, Pratibha Sharma, Ashok Kumar, Kamlendra Singh Bhadoriya
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    Mukesh C. Sharma, Smita Sharma, Pratibha Sharma, Ashok Kumar
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H.P.S. Chauhan, Jaswant Carpenter, Sumit Bhatiya and Abhilasha Bakshi
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    Sheela Joshi, Anjudas Manikpuri, Purti Bilgaiyan and Deepek Khare
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    Sunanda Panda, Anand Kar, Pratibha Sharma, Ashok Kumar
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Bioorganic & Medicinal Chemistry Letters, (Elsevier) 21, 794-797 (2011)
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Aushutosh Mishra, Ruchita Awate, Namrata Soni, Niyati Mishra, Ritu Soni and Pratibha Sharma
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95. Theoretical evaluation of the global and local electrophilicity patterns to characterize hetero Diels Alder cycloaddition in the synthesis of Isoxazolo-[4,5-e]-1,2,3,4-tetrazines
Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
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96. Frontier orbital interactions in the NDAC and IEDDAC Hetero Diels Alder cycloaddition of diazadienes
Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
Canadian Journal of Chemistry, (NRC Press, Canada) 86, 384-394 (2008)
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97. Diels Alder reaction strategy to synthesize 1, 2, 4, 5- tetrazines and exploration of their anti-inflammatory potential
Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
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Aushutosh Mishra, Pratibha Sharma, Namrata Soni, Ruchita Awate
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Savita Khare, Rajendra Chokhare
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Impact Factor: 2.872

100. Synthesis, characterization and catalytic activity of Fe(Salen) intercalated α -zirconium phosphate for the oxidation of cyclohexene
Savita Khare, Rajendra Chokhare
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Impact Factor: 2.872

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S. V. Mahajan, Savita Khare and V.S. Shrivastava
Asian Journal of Chemical and Environmental Research, 4 (3-4) (2011) 56-62.
ISSN No. : 09743049

102. Hazardous metals in pesticides industrial wastes and their correlation and regression,
S. V. Mahajan, Savita Khare and V.S. Shrivastava
Asian Journal of Chemical and Environmental Research, 4 (2011) 20-23.
ISSN No. : 09743049

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Savita Khare and S.V. Mahajan
Journal of Environmental Research and Development, 3 (4) (2009) 1164
ISSN No.: 0973-6921

104. Study of Manganese (II) supported Titanium Tungstate as catalyst for epoxidation of cyclohexene with dry TBHP.
Savita Khare and Rajendra Chokhare
Journal of Environmental Research and Development, 2(4) (2008) 537
ISSN No.: 0973-6921

III.2 Number of papers published in peer reviewed journals (national / international):

104 (as above)

III.3 List and Records and Details of patents and income generated :

Nil

III.4 List and Record of Areas of consultancy and income generated:

Nil

III.5 List and Record of Faculty selected nationally/internationally to visit other laboratories in India and abroad:

International Collaboration of the Professors:

(i) Prof. K. K. Pandey

Alexander von Humboldt Fellow, Germany	(July, 2010- September, 2010) (University of Wurzburg, Germany) (August, 2011- October, 2011) (University of Marburg, Germany)
Visiting Professor, Departament de Quimica, Universidad Autonoma de Barcelona, Spain	May, 2008- June, 2008
Emerson Fellow, Emerson Centre for Scientific Computation, Emory University, USA	July, 2008- September, 2008
Visiting Professor, Departament de Quimica, Universidad Autonoma de Barcelona, Spain	May, 2009
Institute of Chemical Research of Catonia (ICIQ), Tarragona, Spain	June, 2009- July, 2009
Emerson Fellow, Emerson Centre for Scientific Computation, Emory University, USA	August, 2009- October, 2009

(ii) Prof. Ashok Kumar

Nov.10, 2008 – Feb.9, 2009	Visited University of Pecs, Hungary under Indo-Hungarian Exchange Program

III.6 List and Record of Faculty serving in

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

- Faculty members have reviewed many papers of International Repute.
- Dr. H.P.S. Chauhan and Dr. Ashok Kumar are the members in Editorial Board of some National Journals.
- Most of faculty members are referee to national/ international journals

III.7 Research thrust area recognized by funding agencies for the department:

Computational Chemistry, Inorganic and Organic Synthesis, Catalysis, Medicinal Chemistry, Material Science,Organometallics,Coordination Chemistry, Nanotechnology, Bio-informatics.

III.8 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.

Details of research grant received from different agencies during the last five years: 2007-2012

Name of the Investigator	Title of the project and duration	Status	Amount sanctioned	Funding agency
Dr. R.Prasad	Quantum Mechanical and Molecular Mechanics Computation of few Molecules, Reactions and Nano Materials.	Ongoing	Rs. 4,94,000/-	MPCST, Bhopal
Dr.H.P.S Chauhan	Group 15 Metal and Organometallic Derivatives with Mixed Sulphur and/or Oxygen Donor Ligands: Synthesis and Characterization: Thermal and Biochemical Studies	Ongoing	Rs. 8,04,800/-	UGC, New Delhi
Dr. H.P.S. Chauhan	Studies on the Synthesis and Characterization of some Group 15 Metal Nano Complexes with Sulfur Donar Ligands.	Ongoing	Rs. 7,83,000/-	MPCST, Bhopal.
Dr. Ashok Kumar	Efficient Construction of Novel Triazole as Potential Therapeutics : A Classical Versus Click Chemistry Approach	Ongoing	Rs. 44,84,000/-	DRDO New Delhi

III.9 List and details of Inter-institutional collaborative projects and grants received (a) All India collaboration b) International

International Collaboration of the Professors:

Dr. K.K. Pandey

Alexander von Humboldt Fellow, Germany	(July, 2010- September, 2010) (University of Wurzburg, Germany) (August, 2011- October, 2011) (University of Marburg, Germany)
Visiting Professor, Departament de Quimica, Universidad Autonoma de Barcelona, Spain	May, 2008- June, 2008
Emerson Fellow, Emerson Centre for Scientific Computation, Emory University, USA	July, 2008- September, 2008
Visiting Professor, Departament de Quimica, Universidad Autonoma de Barcelona, Spain	May, 2009
Institute of Chemical Research of Catonia (ICIQ), Tarragona, Spain	June, 2009- July, 2009
Emerson Fellow, Emerson Centre for Scientific Computation, Emory University, USA	August, 2009- October, 2009

Dr. Ashok Kumar

Visited University of Pecs, Hungary under Indo-Hungarian Exchange Program	Nov.10, 2008 – Feb.9, 2009

III.10 List and details of Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, etc.; total grants received.

Rs. 30 lakh as FIST support from DST

III.11 List and Details of Research facility / centre with

State recognition

National recognition

International recognition

New equipments such as FTIR and UV-Vis spectrophotometer have been purchased to augment the research activity of the School and facilities for M.Sc. practicals. Besides, C-DAE –CSR is situated in the campus where

- TEM
- SEM
- AFM
- XRD
- ESCA
- N2, He plant facilities are freely available .There is MOU between IUC and DAVV.

Facilities of Sophisticated Instrumentation Centre (NMR, SC-XRD, GCMS, LCMS, Elemental and others) of IIT, Indore are available on payment basis.

III.12 List and details of Special research laboratories sponsored by / created by industry or corporate bodies: **Nil**

3.1 Promotion of Research

3.1.1 Composition of Departmental Research Committee, List of members and minutes of its meeting:

(1) Dr. K.K. Pandey
(2) Dr. A.V. Bajaj
(3) Dr. Ashok Kumar
(4) Dr. H. P. S. Chauhan
(5) Dr. (Mrs.) Sheela Joshi
(6) Dr. (Mrs.) Pratibha Sharma
(7) Dr. S. L. Garg, Principal, GACC, Indore
(8) Dr. (Mrs.) Mangla Dave, Govt. Holkar Science College, Indore

A. Records of DRC regarding monitoring and addressing issues related to research-
Ph.D. students selected and admitted in December 2012 by DRC.

B. Record of DRC recommendations which have been implemented and their impact-
Notified by University

3.1.2 Information of research centers in its affiliated / constituent colleges which are monitored by the DRC of the department:

(1) School of Chemical Sciences, DAVV, Indore
(2) Govt. Holkar Science College, Indore
(3) Islamia Karimia College, Indore
(4) PMB Gujarati Science College, Indore
(5) IPS Academy, Indore
(6) Maharani Laxmi Bai Govt. Girls PG College, (New GDC), Kila Maidan, Indore
(7) Mata Jija Bai Govt. Girls PG College (Old GDC), Moti Tabela, Indore

3.1.3 Details of the advanced funds for the sanctioned projects providing seed money simplification of procedures related to sanctions / purchases to be made by the investigators-planned in 2013-14

Autonomy to the principal investigator/coordinator for utilizing overhead charges-**Yes (University deducts from overhead grants)**

(1) Timely release of grants- planned in 2013-14
(2) Timely auditing- planned in 2013-14
(3) Submitted utilization certificates to the funding authorities on time.
(4) Projects are funded by Funding agencies such as MPCST Bhopal, D.S.T. New Deli, CSIR Delhi, DRDO, Delhi and Utilizations are being submitted in time.

3.1.4 Record of interdisciplinary research promoted with other departments /schools of the university:

a. UGC-DAE Consortium for Scientific Research
b. School of Physics, DAVV
c. Collaboration with national/international institutes/industries : Collaborative research work is being carried out by the School as evidenced by Research publications

Collaborative Research work Prof. K. K. Pandey :

(1) Prof. G. Frenking
Faculty of Chemistry,
University of Marburg,
Germany

(2) Prof. Phillip P. Power
Department of Chemistry
University of California Davis
USA

(3) Prof. Agusti Lledos
Department of Chemistry,
University of Autonoma Barcelona, Spain

(4) Prof. F. Maserus
Institute of Chemical Research of Cataonia (ICIQ),
Tarragona, Spain

(5) Dr. D. G. Musaev
Director
Emerson Centre for Scientific Computation,
Emory University, USA

(6) Prof. D. C. Liotta
Editor: J. Medicine Chem. Letters (American Chemical Society, USA)
Department of Chemistry,
Emory University, USA

(7) Prof. Simon Aldridge
Department of Chemistry,
Oxford University, UK

(8) Prof. Holger Braunschweig
Department of Chemistry,
University of Wurzburg, Germany

(9) Prof. Cameron Jones
School of Chemistry
Monash University, Australia

3.1.5 Details of workshops/ training programmes/ sensitization programmes conducted by the department to promote a research culture on campus

1. The school organized National seminar to promote research culture.
2. A workshop on Fostering Research was conducted in university the eminent speakers were
   a) Prof. Priyankar Upadhyay UNESCO Chair Professor, Banaras Hindu University (BHU), Varanasi.
   b) Prof. V. K. Singh, Director, Indian Institute of Science3 Education and Research (IISER), Bhopal.
   c) Prof. H. Padh. Vice- Chancellor, Sardar Patel University, Gujrat.

3.1.6 A. Details of visits of researchers of eminence to visit the campus as adjunct professors-**None**
B. Impact of such efforts on the research activities of the university - **None**

3.1.7 A. Percentage of the total budget of the department which is earmarked for research- **Externally funded grant is adequate.UGC granted Rs. 50 lakh during 2007-12 in XI plan.**
B. Details of heads of expenditure, financial allocation and actual utilization-

Utilization certificate has been submitted to UGC by University Development Section.

3.1.8 A. Details of University funded research and awarded Post Doctoral Fellowships/Research Associate ships- **None**

C. List of students registered with record of source of funding by the university and other sources

No such funds available with University. Research is promoted entirely by funds provided by National funding agencies, Open CSIR JRF and State Rajeev Gandhi fellowships.

3.1.9 A. List and percentage of faculty which have utilized the sabbatical leave for pursuit of higher research in premier institutions within the country and abroad- **25%**
B. Record of the output of these scholars

Prof. K.K. Pandey and Prof Ashok Kumar have availed study leave to pursue research in abroad. Detailed information of institutions is given in **3.1.4.**

3.1.10 A. Details with photographs of national and international conferences organized
B. List highlighting the names of eminent scientists/scholars who participated in these events.

1. The school organized a National Seminar on the theme entitled **"Emerging Trends in Chemical Sciences" in** 2012.

Faculty members have interacted with eminent scientists.

(a) Prof. B. Vishwanathan, IIT Madras
(b) Prof. Deepak Gupta, IIT Kanpur
(c) Prof. P. Yogeeshwari, BITS Pilani, Hyderabad
(d) Prof. Akhilesh Verma, University of Delhi

2. The faculty of the school supported the academic programme of National Conference of "Shanti Swaroop Bhatanagar Award Winners" held on 8-10 March, 2007 and 17-19 July, 2009. Eminent Shanti Swaroop Bhatnagar awardee in Chemical Sciences and related areas were as follows-

(a) Dr. A. Ajayghosh
National Institute for inter disciplinary science, Thiruvanthapuram
(b) Dr. Amalendu Chandra
IIT, Kanpur
(c) Dr. Srikanth Sastry
Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore
(d) Dr. Anil Bharadwaj
Vikram Sarabhai Space Centre, Thiruvanthapuram
(e) Dr. G.P.S.Raghava
Institute of Microbial Technology, Chandigarh
(f) Dr.B.S. Murty
IIT Madras,Chennai
(g) Prof A.K. Ghatak
Emeritus Professor I.I.T. Delhi

3.2 Resource Mobilization for Research

3.2.1 Record of Financial provisions made in the university budget for supporting students' research projects: **Nil**

3.2.2 A. Record of special efforts to encourage its faculty to file for patents
B. List of registered and accepted patents: Nil

3.2.3 Details of ongoing research projects of faculty:

Name of the Investigator	**Title of the project and duration**	**Status**	**Amount sanctioned**	**Funding agency**
Dr. R. Prasad	Quantum Mechanical and Molecular Mechanics Computation of few molecules, Reactions and Nano materials.	Ongoing	Rs. 4,94,000/-	MPCST, Bhopal
Dr.H.P.S. Chauhan	Group 15 Metal and Organometallic Derivatives with Mixed Sulphur and/or Oxygen Donor Ligands: Synthesis and Characterization: Thermal and Biochemical Studies	Ongoing	Rs. 8,04,800/-	UGC, New Delhi
Dr.H.P.S. Chauhan	Studies on the Synthesis and Characterization of some Group 15 Metal Nano Complexes with Sulfur Donar Ligands.	Ongoing	Rs. 7,83,000/-	MPCST, Bhopal.
Dr. Ashok Kumar	Efficient Construction of Novel Triazole as Potential Therapeutics : A Classical Versus Click Chemistry Approach	Ongoing	Rs. 44,84,000/-	DRDO New Delhi

3.2.4 A. Record of projects sponsored by the industry/corporate houses: **Nil**

B. Details such as the name of the project, funding agency and grants received.

Name of the Investigator	**Title of the project and duration**	**Status**	**Amount sanctioned**	**Funding agency**
Dr. R. Prasad	Surface and catalytic studies of nanocrystalline and nanoporous metal oxides. Studies of few catalytic vapour phase alkylation and cyclization reactions.	Completed Completed	Rs.3,06,000/- Rs. 7,64,800/-	CSR-CRS UGC
Dr. Ashok Kumar	Synergistic extraction and spectrophotometric determination of toxic metal ions and lanthanides at trace level by chromogenic substituted calix(n) arenes. Synergistic extraction and stripping voltammetric determination of toxic metal ions and lanthanides at trace level.	Completed Completed	Rs. 10,46,000/- Rs. 17,00,000/-	CSIR DST
Dr.H.P.S. Chauhan	Synthetic, Spectroscopic, Thermal and Biochemical Studies on some Group 14 (Si, Ge and Sn) and Group 15 (As, Sb and Bi) Metal and Organometallic Complexes with some sulphur and/or Oxygen Donor Organic Ligands.	Completed	Rs.4,11,100/-	UGC
Dr.Pratibha Sharma	Design, Synthesis, Electrochemical Studies and Evaluation of Therapeutic Potential of Purines and Benzimadazoles Through Quantitative Structure - Activity Relationship	Completed	Rs.17,20,000/-	DRDO
Dr. R. Prasad	Quantum Mechanical and Molecular Mechanics Computation of few molecules, Reactions and Nano materials.	Ongoing	Rs. 4,94,000/-	MPCST, Bhopal
Dr.H.P.S. Chauhan	Group 15 Metal and Organometallic Derivatives with Mixed Sulphur and/or Oxygen Donor Ligands: Synthesis and Characterization: Thermal and Biochemical Studies	Ongoing	Rs. 8,04,800/-	UGC, New Delhi
Dr.H.P.S. Chauhan	Studies on the synthesis and characterization of some group 15 Metal nano complexes with Sulfur donar ligands.	Ongoing	Rs. 7,83,000/-	MPCST, Bhopal.
Dr. KK Pandey	Structure and bonding analysis of ylidine complexes Ln-M≡E-R(M=Cr, Mo, W; E=Si Ge, Sn Pb; R=Cp,MeS): A DFT study	Ongoing	Rs. 5,95,000/-	CSIR, UGC
Dr. Ashok Kumar	Efficient Construction of Novel Triazole as Potential Therapeutics : A Classical Versus Click Chemistry Approach	Ongoing	Rs. 44,84,000/-	DRDO New Delhi

3.2.5 A. Details of Department recognition for their research activities by national / international agencies (UGC-SAP, CAS; Department with Potential for Excellence; DST-FIST; DBT, ICSSR, ICHR, ICPR, etc.) and the quantum of assistance received

- **Rs. 30 lakhs as FIST support from DST.**

B. Record of any two significant outcomes or breakthroughs achieved by this recognition.

- **The strength of the School has been and continues to be excellence in research and teaching.**
- **All publications have been in high impact factor journals.**
- **Collaborative research activities are promoted with following institutions-**

(1) Institute for Anorganisch-Chemie
Der Universität Göttingen
Germany
(2) Institute für Kristallographie und Mineralogie
Der Universität Frankfurt
Germany
(3) Fachbereich Chemie, Philipps- Universität Marburg
Germany
(4) Department of Chemistry
University of California Riverside
USA
(5) Department of Physical Sciences, University of Pecs
Hungary
(6) UGC-DAE Consortium for Scientific Research,
Indore
(7) Defense Research and Development Establishment (DRDE),
Gwalior

3.2.6 List details of Research projects completed and grants received (funded by National/International agencies).

Name of the Investigator	**Title of the project and duration**	**Status**	**Amount sanctioned**	**Funding agency**
Dr. R. Prasad	Surface and catalytic studies of nanocrystalline and nanoporous metal oxides.	Completed	Rs.3,06,000/-	CSR-CRS
	Studies of few catalytic vapour phase alkylation and cyclization reactions.	Completed	Rs. 7,64,800/-	UGC

Dr. Ashok Kumar	Synergistic extraction and spectrophotometric determination of toxic metal ions and lanthanides at trace level by chromogenic substituted calix(n) arenes. Synergistic extraction and stripping voltammetric determination of toxic metal ions and lanthanides at trace level.	Completed Completed	Rs. 10,46,000/- Rs. 17,00,000/-	CSIR DST
Dr.H.P.S. Chauhan	Synthetic, Spectroscopic, Thermal and Biochemical Studies on some Group 14 (Si, Ge and Sn) and Group 15 (As, Sb and Bi) Metal and Organometallic Complexes with some sulphur and/or Oxygen Donor Organic Ligands.	Completed	Rs.4,11,100/-	UGC
Dr.Pratibha Sharma	Design, Synthesis, Electrochemical Studies and Evaluation of Therapeutic Potential of Purines and Benzimadazoles Through Quantitative Structure - Activity Relationship	Completed	Rs.17,20,000/-	DRDO

Inter-institutional collaborative projects and grants received

i) All India collaboration

ii) International

We are in contact with the other universities and national laboratories of the nation for fruitful academic interaction.

3.3 Research Facilities

3.3.1

A. Infrastructure in the department to facilitate research: All teachers have been provided computer and internet connections. New equipments such as GC, HPLC, FTIR and UV-Vis spectrophotometer have been purchased to augment the research activity of the School

B. Strategies have been evolved to meet the needs of researchers in emerging disciplines

3.3.2 A. Information and Resources catering to the needs of researchers of the department

B. Details of the facility

- **All teachers have been provided computer and Internet connections**
- **Internet facility is also available for students**
- **New equipments such as GC, HPLC, FTIR and UV-Vis spectrophotometer have been purchased to augment the research activity of the School.**

3.3.3 Record of University Science Instrumentation Centre (USIC) facilities been made available to research scholars

3.3.4 Record of provision of residential facilities (with computer and internet facilities) for research scholars, post-doctoral fellows, research associates, summer fellows of various academies and visiting scientists (national/international)

3.3.5 Details of Uses of the Facilities of IUC, CAT, NRCS, IIT Indore and other specialized Research Centers for research

- All teachers have been provided computer and Internet connections
- Internet facility is also available for students. Campus is Wi-Fi.
- New equipments such as GC, HPLC, FTIR and UV-Vis spectrophotometer have been purchased to augment the research activity of the School.
- School is utilizing the following facilities of IUC:
    - TEM
    - SEM
    - AFM
    - XRD
    - ESCA
    - N2, He plant

  These facilities are freely available .There is MOU between IUC and DAVV.
- Facilities of Sophisticated Instrumentation Centre (NMR, SC-XRD, GCMS, LCMS, Elemental and others) of IIT, Indore are available on payment basis.

3.4 Research Publications and Awards

3.4.1 Research journal published, if any, from the department(s)? If yes, indicate the composition of the editorial board, editorial policies and state whether it/they is/are listed in any international database.

No

3.4.2 Details of publications by the faculty:

DR. KRISHNA K. PANDEY

1. Stretched σ-borane complexes of rhodium: A theoretical study
   K.K. Pandey
   Inorg. Chem. Commun. 11 (2008) 288.
   Impact Factor: 1.972

2. σ-Borane complexes of nickel, palladium and platinum. A theoretical study
   K.K. Pandey
   J. Mol. Struct. (THEOCHEM) 855 (2008) 18.
   Impact Factor: 1.288

3. Mixed-ligand Ru(II) complexes with 2,2'-bipyridine and tetradentate Schiff bases ligands: Synthesis, physico-chemical study, DFT analysis, electrochemical and Na binding properties
   L. Mishra, R. Prajapati, K.K. Pandey
   Spectrochimica Acta (A): Molecular and Bimolecular Spectroscoscopy 70 (2008) 79-85.
   Impact Factor: 1.952

4. Transition Metal sigma-borane complexes
   K.K. Pandey
   Coord. Chem. Revs. 253 (2009) 37.
   Impact Factor: 12.110

5. Linear M≡E-Me Versus Bent M-E-Me: Bonding Analysis in Heavier Metal- ylidyne Complexes $[(Cp)(CO)_2M{\equiv}EMe]$ and Metallo-ylidenes $[(Cp)(CO)_3M\text{-}EMe]$ (M = Cr, Mo, W; E = Si, Ge, Sn, Pb)
   Krishna K. Pandey and Agustí Lledós
   Inorg. Chem. 48 (2009) 2748-2759.
   Impact Factor: 4.601

6. The Nature of M-B Versus M=B Bonds in Cationic Terminal Borylene Complexes: Structure and Energy Analysis in the Borylene Complexes $[(\eta^5\text{-}C_5H_5)(CO)_2M\{B(\eta^5\text{-}C_5Me_5)\}]^+$, $[(\eta^5\text{-}C_5H_5)(CO)_2M(BMes)]^+$, and $[(\eta^5\text{-}C_5H_5)(CO)_2M(BNMe_2)]^+$ (M = Fe, Ru, Os)
   Krishna K. Pandey, Agusti Lledos and Feliu Maseras
   Organometallics 28 (2009) 6442-6449.
   Impact Factor: 3.963

7. Structure and Bonding Energy Analysis of Cobalt, Rhodium and Iridium Borylene Complexes $[(\eta^5\text{-}C_5H_5)(CO)M(BNX_2)]$ (X = Me, SiH_3, $SiMe_3$) and $[(\eta^5\text{-}C_5H_5)(PMe_3)M\{BN(SiH_3)_2)]$ (M = Co, Rh, Ir)
   Krishna K. Pandey and Djamaladdin G. Musaev
   Organometallics 29 (2010) 142-148.
   Impact Factor: 3.963

8. Linear versus bent bonding in metal-phosphinidene complexes: Theoretical studies of the electrophilic phosphinidene complexes $[(\eta^5\text{-}C_5H_5)(CO)_2M(PMe)]^+$, $[(\eta^5\text{-}C_5H_5)(CO)_3M(PMe)]^+$ (M = Cr, Mo, W)
   Krishna K. Pandey and Agusti Lledos
   J. Organomet. Chem. 695 (2010) 206-214.
   Impact Factor: 2.384

9. Computational Studies of Transition Metal Selectivity of Octapeptide Repeat Region of Prion Protein (PrP)
   Krishna K. Pandey, James P. Snyder, Dennis C. Liotta and Djamaladdin G. Musaev
   J. Phys. Chem. A 114 (2010) 1127-1135.
   Impact Factor: 2.946

10. New ruthenium(II) thiolato complexes: Synthesis, reactivity, spectral, structural and DFT studies
    Sudhakar D. Dwivedi, Santosh K. Dubey, Ashish K. Singh, Krishna K. Pandey and Daya S. Pandey
    Inorg. Chim. Acta 363 (2010) 2095-2103.
    Impact Factor: 1.846

11. Structure and Bonding Energy Analysis of M-Ga Bonds in Dihalogallyl Complexes Trans-[$X(PMe_3)_2M(GaX_2)$] (M = Ni, Pd, Pt; X = Cl, Br, I)
    Krishna K. Pandey, Pankaj Patidar, Holger Braunschweig
    Inorg. Chem. 49 (2010) 6994-7000.
    Impact Factor: 4.601

12. Nature of M-Ga Bonds in Dihalogallyl Complexes (η^5-C_5H_5)$(Me_3P)_2M(GaX_2)$ (M = Fe, Ru, Os) and (η^5-C_5H_5)$(OC)_2M(GaX_2)$ (X = Cl, Br, I): A DFT Study
    Krishna K. Pandey, Pankaj Patidar, Simon Aldridge
    J. Phys. Chem. A 114, 2010, 12099-12105.
    Impact Factor: 2.946

13. Nature of Bonding in Terminal Borylene, Alylene and Gallylene complexes of Vanadium and Niobium [(η^5-C_5H_5)$(CO)_3M(ENR_2)$] (M = V, Nb; E = B, Al, Ga; R = CH_3, SiH_3, CMe_3, $SiMe_3$): A DFT Study
    Krishna K. Pandey, Holger Braunschweig, Agusti. Lledós
    Inorg. Chem. 50 (2011) 1402-1410.
    Impact Factor: 4.601

14. DFT Study on the Alkylborylene and Haloborylene Complexes of Manganese and Rhenium: Structure and Bonding Energy Analysis in [(η^5-C_5H_5)$(CO)_2M(BR)$] and [(η^5-C_5H_5)$(CO)_2M(BX)$] (M = Mn, Re; R = Me, Et, iPr, tBu; X = F, Cl, Br, I)
    Krishna K. Pandey, Holger Braunschweig, Rian D. Dewhurst
    Eur. J. Inorg. Chem. 2011, 2045-2056
    Impact Factor: 3.049

15. Unexpected Generation of Diastereomers by Double Diboration of a Dialkyne
    F. Bauer, H. Braunschweig, K. Gruß, Christoph Lambert, Krishna K. Pandey, K. Radacki, D. Reitzenstein
    Chem.Eur.J.17(2011)5230-5233.
    Impact Factor: 5.925

16. Nature of M-Ga Bonds in Cationic Metal-Gallylene Complexes of Iron, Ruthenium and Osmium [(η^5-C_5H_5)$(L)_2M(GaX)]^+$. A Theoretical Study
    Krishna K. Pandey, Simon Aldridge
    Inorg. Chem. 50 (2011) 1798-1807.
    Impact Factor: 4.601

17. Nature of M-Bi bonds in dihalobismuth complexes of nickel, palladium and platinum trans-[$X(PMe_3)M(BiX_2)$] (M = Ni, Pd, Pt; X = Cl, Br, I)
    Krishna K. Pandey
    Comput. Theoret. Chem. 967 (2011) 140-146.
    Impact Factor: 1.288

18. Nature of M-E bonds in metallosilylenes, germylenes, stannylenes and plumbylenes [(η^5-C_5H_5)(Me_3P)$(H)_2$M(EPh)] (M = Fe, Ru, Os; E = Si, Ge, Sn, Pb)
    Krishna K. Pandey, Philip P. Power
    Organometallics 30 (2011) 3353-3361
    Impact Factor: 3.963

19. Structure and bonding energy analysis of cationic metal-ylyne complexes of molybdenum and tungsten [(MeCN)$(PMe_3)_4$M≡EMes]$^+$ (M = Mo, W; E = Si, Ge, Sn, Pb): A Theoretical Study
    Krishna K. Pandey, Pankaj Patidar, Philip P. Power
    Inorg. Chem. 50 (2011) 7080-7089
    Impact Factor: 4.601

20. Structure and bonding analysis of dimethylgallyl complexes of iron, ruthenium and osmium [(η^5-C_5H_5)$(CO)_2$M($GaMe_2$)] and [(η^5-C_5H_5)$(Me_3P)_2$M($GaMe_2$)]
    Krishna K. Pandey
    J. Phys. Chem. A 115 (2011) 8578-8585.
    Impact Factor: 2.946

21. Structure and bonding in haloarylgallyl complexes of iron, ruthenium and osmium [(η^5-C_5H_5)$(CO)_2$M{Ga(X)(Ph)}]: A theoretical study
    Krishna K. Pandey, Pankaj Patidar
    J. Organomet. Chem. 696 (2011) 3536-3542.
    Impact Factor: 2.384

22. Bis(borylene) Complexes of Cobalt, Rhodium, and Iridium [(η^5-C_5H_5)M($BNX_2)_2$] (X = Me, SiH_3, $SiMe_3$): A Bonding Analysis
    Krishna K. Pandey
    Organometallics 30 (2011) 5851- 5858.
    Impact Factor: 3.963

23. Structure and bonding analysis of dihalogallyl and dimethylgallyl complexes of molybdenum and tungsten [(η^5-C_5H_5)$(CO)_3$M(GaX_2)] (M = Mo, W; X = Cl, Br, I, Me): A Theoretical Study
    Krishna K. Pandey
    Comput. Theoret. Chem. 973 (2011) 13-19.
    Impact Factor: 1.288

24. The nature of M-Ga in metal(I) gallyl complexes of copper, silver and gold: A Theoretical study
    Krishna K. Pandey
    J. Organomet. Chem. 701 (2012) 75-79
    Impact Factor: 2.384

25. Theoretical investigation of M≡E bonds in transition metaleylidyne complexes trans-[H$(PMe_3)_4$M≡ER] (M = Mo, W; E = Si, Ge, Sn, Pb; R = Mes, Xylyl)
    Krishna K. Pandey, Pankaj Patidar
    J. Organomet. Chem. 702 (2012) 59-66
    Impact Factor: 2.384

26. Structure and bonding analysis in dihalobismuth complexes of iron, ruthenium and osmium $[(\eta^5\text{-}C_5H_5)(CO)_2M(BiX_2)]$: A theoretical Study
Krishna K. Pandey, Pankaj Patidar, Pradeep Tiwari
Polyhedron 34 (2012) 84-91.
Impact Factor: 2.057

27. What is the best bonding model of the (σ-H-BR) species bound to a transition metal: Bonding analysis in complexes $[(H)_2Cl(PMe_3)_2M(\sigma\text{-}H\text{-}BR)]$ (M = Fe, Ru, Os)
Krishna K. Pandey
Dalton Trans. 41 (2012) 3278-3286.
Impact Factor: 3.840

28. Structure and bonding analysis of dimethylgallyl complexes of cobalt, rhodium and Iridium $[Me(PMe_3)_2(Me_3GaCl)M(GaMe_2)]$ (M = Co, Rh, Ir) and $[Me(PMe_3)_2ClIr(GaMe_2)]$: A theoretical study
Krishna K. Pandey
J. Organomet. Chem. 710 (2012) 6-11.
Impact Factor: 2.384

29. Theoretical investigation of triple bond in molybdenum complexes trans-$[X(PMe_3)_4Mo{\equiv}E(Mes)]$ (X = F, Cl, Br, I; E = Si, Ge, Sn, Pb): A DFT study
Krishna K. Pandey, Pankaj Patidar
Polyhedron 37 (2012) 85-93.
Impact Factor: 2.057

30. A theoretical study of the bonding and charge distribution in cationic group 8 metal borylene and alylene complexes: Consequences for complex stability and reactivity
Krishna K. Pandey
Polyhedron, 43 (2012) 131-139.
Impact Factor: 2.057

31. The Nature of Mo≡E Bonds: Structure and Bonding Analysis of the Molybdenum-Ylidyne Complexes Trans-$[X(dmpe)_2Mo{\equiv}E(\eta^1\text{-}C_5H_5)]$ (E = Si, Ge, Sn, Pb; X = H, Cl, Br, I, CN)
Krishna K. Pandey, Pankaj Patidar, Alexander C. Filippou
Inorg. Chem. 2012 Accepted.
Impact Factor: 4.601

32. Bonding energy analysis in cationic borylene complexes of palladium and platinum: A theoretical study
Krishna. K. Pandey
Polyhedron 52 (2013) 1431-1439.
Impact Factor: 2.057

33. Nature of M-$(\eta^2\text{-}H\text{-}SiR_2)$ in chromium, molybdenum and tungsten complexes $[(\eta^2\text{-}C_5H_5)(dmpe)M(\eta^2\text{-}H\text{-}SiR_2)]$ and $[(\eta^2\text{-}C_5H_5)(CO)_2M(\eta^2\text{-}H\text{-}SiR_2)]$: A theoretical study
Krishna K. Pandey
Polyhedron 55(2013) 241-248
Impact Factor: 2.057

34. Nature of M–Ge Bonds in the Metallogermylene Complexes of Chromium, Molybdenum, and Tungsten $[(\eta^5\text{-}C_5H_5)(CO)_3M\{GeN(SiMe_3)R\}]$ and $[(\eta^5\text{-}C_5H_5)(CO)_3M\{GeN(Ph)R\}]$ (R = Ph, Mesityl (Mes)): A Theoretical Study
    Krishna K. Pandey and Cameron Jones
    Organometallics 32 (2013) 3395-3403
    Impact Factor: 3.963

35. Bonding analysis of the neutral electrophilic phosphinidene complexes of vanadium and niobium $[(\eta^5\text{-}C_5H_5)(CO)_3M(PNR_2)]$ (R = Me, ^{i}Pr, ^{t}Bu): A DFT study
    Krishna K. Pandey, Pradeep Tiwari, Pankaj Patidar
    J. Organomet. Chem. 740 (2013) 135-140.
    Impact Factor: 2.384

36. Accurate theoretical description of the M-PNR_2 bonds in phosphinidene complexes of manganese and rhenium $[(CO)_5M\text{-}PNR_2]^+$ (R = Me, ^{i}Pr, ^{t}Bu) and $[(PMe_3)(CO)_4M\text{-}PN^iPr_2]^+$: A DFT-D3 study
    Krishna K. Pandey, Pradeep Tiwari, Pankaj Patidar, Sunil K. Patidar, Ravi Vishwakarma and Pankaj K. Bariya
    J. Organomet. Chem., (2013) In Press
    Impact Factor: 2.384

DR. R. PRASAD

1. A DFT assisted mechanism evolution of the Carbonylation of Ethylene glycol to ethylene carbonate by urea over $Zn(NCO)_2.(NH_3)_2$ catalyst
   Prabhakar Sharma, Reena Dwivedi, Rajiv Dixit and Rajendra Prasad
   Ind. Eng. Chem. Res. (2013) DOI 10.1021/ie400745x
   Impact Factor: 2.206

2. Microwave-Assisted Synthesis of Mixed Metal-Oxide Nanoparticles
   Akrati Verma, Reena Dwivedi, R. Prasad, and K. S. Bartwal
   Journal of Nanoparticles (2013), Article ID 737831,
   Impact Factor: 1.546

3. Synthesis of ethylene carbonate from cyclocondensation of ethylene glycol and urea over $ZnO.Cr_2O_3$catalyst system controlled by co-precipitation method.
   Sheenu Bhadauria, Samidha Sexana, Rajandra Prasad, Prabhakar Sharma, Reena Dwivedi. European J Chem., 3, (2012) 235
   Impact Factor: 0.746

4. Microwave assisted synthesis of tetragonal nanocrystalline zirconia Nanoparticles
   Reena Dwivedi, Anjali Maurya, R Prasad and K S Bartwal
   Journal of Alloys and Compounds, 509 (2011) 6848–6851.
   Impact Factor: 2.28

5. Recent Progress in Non-linear Optical Material, Syntheses, Characterization and Geometry Optimization of Dicinnamalacetone
   Sheenu Bhadauria, Malyaj Das, Reena Dwivedi.
   Scholars Research Library 2011, 2 (2):36-44.
   ISSN No. 0976-0970

6. Effect of microwave on distribution of Zr^{4+} and Ti^{4+} during sol-gel synthesis of $ZrTiO_4$ nanoparticles.
   Reena Dwivedi, Akrati Verma, R. Prasad, K.S. Bartwal
   Optical Materials. 2012, 35, 33-37
   Impact Factor: 2.02

7. Rigid thermosetting liquid moulding resin from sunflower oil
   Navneet Hardia, P. L. Gupta, R.Dwivedi, Samidha Saxena, R. Prasad
   Indian journal of Chemical technology, 18, 271-276, 2011.
   Impact Factor: 0.267

8. Kinetics studies and mechanism evolution of the epoxidation of styrene over nanoporous Au doped TS-1
   Samidha Saxena, Reena Dwivedi, Sheenu Bhadauria, V. R. Chumbhale and R. Prasad
   Polish Journal of Chemical Technology, 2010, 12(4), 72-78.
   Impact Factor: 0.444

DR. ASHOK KUMAR

1. Comparative QSAR and pharmacophore modeling of substituted 2-[2'-(dimethylamino)ethyl]-1,2-dihydro-3*H*-dibenz[de,h]isoquinoline-1,3-diones derivatives as anti-tumor activity
   Mukesh C. Sharma, Smita Sharma, Pratibha Sharma, Ashok Kumar
   Medicinal Chemistry Research, (Springer) DOI 10.1007/s00044-013-0554-z (2013)
   Impact factor 1.612

2. Molecular modeling and pharmacophore approach for structural requirements of some 2-substituted-1-naphthols derivatives as potent 5-lipoxygenase inhibitors
   Mukesh C. Sharma, Smita Sharma, Pratibha Sharma, Ashok Kumar
   Medicinal Chemistry Research, (Springer) DOI 10.1007/s00044-013-0499-2 (2013)
   Impact factor 1.612

3. Pharmacophore and QSAR modeling of some structurally diverse azaaurones derivatives as anti-malarial activity
   Mukesh C. Sharma, Smita Sharma, Pratibha Sharma, Ashok Kumar
   Medicinal Chemistry Research, (Springer) DOI 10.1007/s00044-013-0609-1 (2013)
   Impact factor 1.612

4. QSAR and pharmacophore approach on substituted imidazole derivatives as angiotensin II receptor antagonists
   Mukesh C. Sharma, Smita Sharma, Pratibha Sharma, Ashok Kumar, Kamlendra Singh Bhadoriya
   Medicinal Chemistry Research, (Springer) DOI 10.1007/s00044-013-0638-9 (2013)
   Impact factor 1.612

5. Study of physicochemical properties-inducible nitric oxide synthase relationship of substituted quinazolinamines analogs: Pharmacophore identification and QSAR studies
   Mukesh C. Sharma, Smita Sharma, Pratibha Sharma, Ashok Kumar
   Arabian Journal of Chemistry, (Elsevier) (2013)
   Impact factor 2.266

6. QSAR modeling of synthesized 3-(1,3-benzothiazol-2-yl-2-phenyl quinazolin-4-(3H) ones as potent antibacterial agent
   Ashok Kumar, Pratibha Sharma, Prerna Kumari, Jitendra Singh and M. P. Kaushik
   Medicinal Chemistry Research, (Springer) 21, 1136–1148 (2012)
   (Impact factor 1.271)

7. Synthesis and exploration of QSAR model of 2-methyl-3-[2-(2-methylprop-1-en-1-yl)-1H-benzimidazol-1-yl]pyrimido[1,2-a]benzimidazol-4(3H)-one as potential antibacterial agents
   Pratibha Sharma, Ashok Kumar, Manisha Sharma, Jitendra Singh, Prabal Bandyopadhyay, Manisha Sathe, & M. P. Kaushik
   Journal of Enzyme Inhibition and Medicinal Chemistry, 27(2), 294-301 (2012)
   (Impact factor 1.617)

8. Exploration of antimicrobial and antioxidant potential of newly synthesized 2,3-disubstituted quinazoline-4(3H)-ones
   Ashok Kumar, Pratibha Sharma, Prerna Kumari and Bhagwan Lal Kalal
   Bioorg. Med. Chem. Lett. (Elsevier) 21, 4353-4357 (2011)
   (Impact factor 2.554)

9. Synthesis and Metal Extraction Behavior of Pyridine and 1,2,4-Triazole Substituted Calix[4]arenes
   Ashok Kumar, Pratibha Sharma, Bhagwan Lal Kalal, and Lal Kumar Chandel
   J. Incl. Phenom. Macrocycl. Chem., 68, 369–379 (2010)
   (Impact factor 1.886)
10. Effect of molecular environment on the formation kinetics of complexes of malvidin-3-o-glucoside with caffeic acid and catechin.
    Sa´ndor Kunsa´gi-Ma´te´, Ashok Kumar, Pratibha Sharma, La´szlo´ Kolla´r, and Martin Pour Nikfardjam
    J. Phys. Chem. B (ACS Publication) 113, 7468-7473 (2009)
    (Impact factor 3.696)

11. Synthesis and QSAR Modeling of 2-acetyl-2-ethoxycarbonyl-1-[4(4'-arylazo) -phenyl]-N,N-dimethyl-aminophenylaziridines as Potential Antibacterial Agents
    Pratibha Sharma, Ashok Kumar, Siya Upadhyay, Vinita Sahu and Jitendra Singh
    European journal of Medicinal Chemistry (Elsevier) 44(1), 251-259 (2009)
    (Impact factor 3.346)

12. Synthesis of bio-active Spiro-2-[3'-(2'-phenyl)-3H-indolyl]-1-aryl-3-phenyl aziridines and SAR studies on their antimicrobial behaviour
    Pratibha Sharma, Ashok Kumar, Siya Upadhyay, Vinita Sahu, and Jitendra Singh
    Medicinal Chemistry Research (Springer) 18 (5), 383-395 (2009)
    (Impact factor 1.271)

13. Synergistic extraction and spectrophotometric determination of palladium (II) iron (III) and tellurium (IV) at trace level by newly synthesized p-[4-(3, 5-dimethyl isoxazolyl) azophenylazo] calix (4) arene
    Ashok Kumar, Pratibha Sharma, Lal Kumar Chandel and Bhagwan Lal Kalal
    J. Incl. Phenom. Macrocycl. Chem., 61, 335-342 (2008)
    (Impact factor 1.886)

14. Synergistic solvent extraction of copper, cobalt, rhodium and iridium into 1, 2-Dichloroethane at trace level by newly synthesized 25, 26, 27, 28-tetrahydroxy-5,11, 17, 23-tetra-[4-(N-hydroxyl-3-phenylprop-2-enimidamido) phenylazo] calix[4]arene
Ashok Kumar, Pratibha Sharma, Lal Kumar Chandel, Bhagwan Lal Kalal, Sandor Kunsagi-Mate
J. Incl. Phenom. Macrocycl. Chem., 62, 285–292 (2008)
(Impact factor 1.886)

DR. H.P.S. CHUAHAN

1. Synthesis and Characterization of Toluene-3,4-dithiolatoantimony(III) Derivatives with some Oxygen and/or Sulphur Donor Ligands
H.P. S. Chauhan, Sumit Bhatiya and Abhilasha Bakshi
ELSEVIER, Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 74, 67-73 (2009)
(Following this paper top 40 articles are published on the same topic after we have published)
Impact Factor: 1.77

2. Synthetic, spectral as well as in vitro antimicrobial studies on some bis(N,N-dialkyldithiocarbamato)bismuth(III) alkylenedithiophosphates
H.P. S. Chauhan, Abhilasha Bakshi and Sumit Bhatiya
WILEY-INTERSCINCE, Applied Organometallic Chemistry, 24, 317-325 (2010)
Impact Factor: 2.06

3. Bismuth(III)bis(N,N-diethyldithiocarbamato)alkylenedithiophosphates: FAB+ mass, Thermal decomposition and SEM studies
H. P. S. Chauhan, Abhilasha Bakshi and Sumit Bhatiya
TAYLOR & FRANCIS, Phosphorus, Sulphur and Silicon, 186, 345-353 (2011)
Impact Factor: 0.62

4. Synthesis, Spectroscopic Structural Characterization and Antimicrobial Studies of 1,3-Dithia-2-arsacyclopentane Derivatives with Oxygen and Sulfur Donor Ligands
H. P. S. Chauhan, Sumit Bhatiya and Abhilasha Bakshi
TAYLOR & FRANCIS, Phosphorus, Sulphur and Silicon, 186, 511-519 (2011)
Impact Factor: 0.62

5. Synthetic, spectroscopic, thermal and structural studies of antimony(III) bis(pyrrolidinedithiocarbamato)alkyldithiocarbonates.
H. P. S. Chauhan and Abhilasha Bakshi
Springer, Journal of Thermal Analysis and Calorimetry, 105, 937-946 (2011)
Impact Factor: 1.75

6. Synthesis, spectroscopic characterization as well as in vitro antibacterial activity of antimony(III) bis(dialkyldithiocarbamato)alkyldithiocarbonates
H. P. S. Chauhan, Abhilasha Bakshi and Sumit Bhatiya
ELSEVIER, Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 81, 417-423 (2011)

Impact Factor: 1.77

7. Synthesis, spectroscopic, thermal and antimicrobial studies of toluene-3,4-dithiolatoarsenic(III) derivatives with some oxygen and sulphur donor ligands
   H. P. S. Chauhan and Sumit Bhatiya
   Elsevier, Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 97, 1133-1139 (2012)
   Impact Factor: 2.098

8. Bis(diethyldithiocarbamato)antimony(iii) derivatives with oxygen and sulphur donor ligands: synthesis, ESI–mass and spectral characterization
   H.P.S. Chauhan, Jaswant Carpenter, Sumit Bhatiya and Abhilasha Bakshi
   Taylor & Francis, Phosphorus, Sulphur and Silicon, DOI:10.1080/10426507.2013.777729 (2013)
   Impact Factor: 0.716

DR. SHEELA JOSHI

1. Synthesis, spectroscopic characterization and antibacterial screening of novel Mannich bases of Ganciclovir
   Sheela Joshi, Purti Bilgaiyan, Anju Pathak
   Arabian Journal of Chemistry (2013), (In press)
   Impact factor 2.266

2. Synthesis and In-vitro Study of some medicinally important Mannich Bases derived from 2-amino-9 [{(1,3 dihydroxy propane-2yl) oxy} methyl] 6-9 dihydro-3H-purin-6-one
   Sheela Joshi, Purti Bilgayan and Anju Pathak
   J.Chil.Chem.Soc, 58, N^{o} 3(2012) (Impact factor: 0.675)

3. Synthetic, Spectral, Antimicrobial and QSAR Studies on Novel Mannich Bases of Glutarimides.
   Anjudas Manikpuri, Sheela Joshi and P V. Khadikar
   J. Chil. Chem. Soc. Vol.55 N.3 Concepción 283-292 (2010)
   (Impact factor: 0.675)

4. Synthesis and antimicrobial study of the Mannich Bases of 4-{(Dipropylamino)[Bis (Methylene)] Sulfanyl} Benzamide
   Sheela Joshi, Anjudas Manikpuri, and P.V.Khadikar
   Journal of Engineering, Science and Management Education, Vol.2, (2010), 29-33
   ISSN No. 0976-0121

5. Synthesis spectral studies and antimicrobial study of aminomethylated derivatives of 7-azaspiro [4.5] decane 6-8 dione.
   Sheela Joshi, Purti Bilgaiyan, Anjudas Manikpuri, Kapil Vyas, Anju Pathak
   Research Journal of Pharmaceutical, Biological and Chemical Sciences, Vol.1,(2010) 23.
   ISSN No. 0975-8585

6. Synthesis, characterization and Antibacterial Screening of aminomethylated derivatives of 7-azaspiro[4.5]decane-6,8-dione.
   Sheela Joshi, Purti Bilgaiyan, Anju Das Manikpuri, Anju Pathak, Kapil Vyas
   Der Pharma Chemica, Vol.2,(2010), 122-129.
   ISSN No. 0975-413X

7. Convenient one pot synthesis of antimicrobial evalution of some new Mannich bases of 5-nitro-2 furfuraldehyde semicarbazone.
   Sheela Joshi, Anjudas Manikpuri, Prapti Tiwari and P.V.Khadikar
   Oxidation communication, 33(2010), 398-407
   (Impact factor: 0.241)

8. Synthesis and SAR studies on the new potentially bioactive Mannich bases of 2-methyl benzamide derived from sulphonamides.
   Sheela Joshi, Anjudas Manikpuri, Deepak Khare and P.V.Khadikar
   Oxidation communication, 33(2010), 380-397
   Impact factor: 0.241)

9. Synthesis and Structural charecterisation of Mannich bases of 5 Uriedohydantoin.
   Sheela Joshi, Anjudas Manikpuri, Deepak Khare and P.V.Khadikar
   Oxidation communication, 32, No.3, (2009), 714-723
   (Impact factor: 0.241)
10. Synthesis and biological evalution of medicinally important Mannich bases of 5-nitro 2-furfuraldehyde semicarbazone derived from secondary amines.
    Sheela Joshi, Anjudas Manikpuri, Prapti Tiwari.
    International J. of chemical sciences, vol. 7(2), (2009),869-877.
    (Impact factor: 0.063)

11. Synthesis, spectroscopic and antimicrobial studies of Mannich bases through active hydrogen compounds.
    Sheela Joshi, Anjudas Manikpuri, Deepak Khare.
    International J. of chemical sciences, vol.7 (2), (2009), 825-836.
    (Impact factor: 0.063)

12. Studies of biological potential Mannich bases of 3,5-dinitrobenzyl-4-amino benzamide.
    Sheela Joshi and Navita Khosla
    J. of Environmental Research and Development, 2, (2008), 612- 617
    (Impact factor: 0.078)

13. Synthesis and studies of Mannich bases of 2-chloro 4-nitro benzamide as antimicrobial agent.
    Sheela Joshi, Anjudas Manikpuri, Purti Bilgaiyan and Deepek Khare
    J. of Environmental Research and Development, Vol 3, (2008), 37-43.
    (Impact factor: 0.078)

14. Synthesis, Characterization and Antimicrobial activity of Mannich bases of 2-chloro 4-nitro benzamide Derived from sulphonamides.
    Sheela Joshi, Anju Das Manikpuri and Deepak Khare
    J. Indian Chemical Society, Kolkata 85, (2008), 1-5.
    (Impact factor: 0.275)

DR. PRATIBHA SHARMA

1. Synthesis and QSAR modeling 1-[3-methyl-2-(aryldiazenyl)-2*H*-aziren-2-yl]ethanones as potential antibacterial agents
   Vinita Sahu, Pratibha Sharma, Ashok Kumar
   Medicinal Chemistry Research, (Springer) 22, 2476–2485 (2013)
   Impact factor 1.612

2. Exploration of Cardioprotective potential of *N*,α-L-rhamnopyranosyl vincosamide, an indole alkaloid, isolated from the leaves of Moringa oleifera in isoproterenol induced cardiotoxic rats: In vivo and in vitro studies
   Sunanda Panda, Anand Kar, Pratibha Sharma, Ashok Kumar
   Bioorg. Med. Chem. Lett. (Elsevier) 23, 959–962 (2013)
   Impact factor 2.338

3. Exploration of antimicrobial potential of essential oils of *Cinnamomum glanduliferum*, *Feronia elephantum*, *Bupleurum hamiltonii* and *Cyclospermum leptophyllum* against foodborne pathogens
   Charu Singh, Shalini Singh, Chitra Pande, Geeta Tewari, Veena Pande, Pratibha Sharma,
   Pharmaceutical Biology (Informa Healthcare, UK), (Accepted) (2013).
   Impact factor 1.206

4. A facile and rapid one-step synthesis of 8-substituted xanthine derivatives via tandem ring closure at room temperature
   Prabal Bandyopadhyay, Sumit K. Agrawal, Manisha Sathe, Pratibha Sharma, M.P. Kaushik
   Tetrahedron (Elsevier), 68(20), 3822-3827 (2012)
   (Impact factor 3.025)

5. Exploration of polystyrene-supported 2-isobutoxy-1-isobutoxycarbonyl-1,2-dihydroquinoline (PS-IIDQ) as new coupling agent for the synthesis of 8-substituted xanthine derivatives
   Prabal Bandyopadhyay, Manisha Sathe, Pratibha Sharma, M.P. Kaushik
   Tetrahedron Letters (Elsevier), 53, 4631-4635 (2012).
   (Impact factor 2.683)

6. Oviposition and flight orientation response of Aedes aegypti to certain aromatic aryl hydrazono esters Lopamudra Guha, T. Seenivasagan, Prabal Bandyopadhyay, S. T. Iqbal, Manisha Sathe, Pratibha Sharma, B. D. Parashar and M. P. Kaushik.
   Parasitology Research (Springer), DOI: 10.1007/s00436-012-2921-y (2012).
   (Impact factor 2.149)

7. Methyl 2-(4-methylphenyl)-2H-azirine-3-carboxylate as Dienophile in Hetero-Diels-Alder Cycloaddition: A DFT Approach
   Pratibha Sharma, Ashok Kumar and Vinita Sahu
   Letters in Organic Chemistry, 8, 132-137 (2011)
   (Impact factor 0.822)

8. Mesoporous Mixed Metal Oxide Nanocrystals: Efficient and Recyclable Heterogeneous Catalysts for the Synthesis of 1,2-Disubstituted Benzimidazoles and 2- Substituted Benzothiazoles
   Prabal Bandyopadhyay, Manisha Sathe, G. K. Prasad, Pratibha Sharma and M.P. Kaushik
   Journal of Molecular Catalysis A (Elsevier) 341, 77-82 (2011)
   (Impact factor 2.947)

9. Synthesis and bio-evaluation of aryl hydrazono esters for oviposition responses in Aedes albopictus
   Prabal Bandyopadhyay , Lopamudra Guha, T. Seenivasagan, Manisha Sathe, Pratibha Sharma, B. D. Parashar, M. P. Kaushik
   Bioorganic & Medicinal Chemistry Letters, (Elsevier) 21, 794-797 (2011)
   (Impact factor 2.554)

10. Exploration of in vitro time point quantitative evaluation of newly synthesized benzimidazole and benzothiazole derivatives as potential antibacterial agents
    Prabal Bandyopadhyay, Manisha Sathe, S. Ponmariappan, Arti Sharma, Pratibha Sharma, A.K. Srivastava, M.P. Kaushik.
    Bioorganic & Medicinal Chemistry Letters, (Elsevier) 21, 7306–7309 (2011)
    (Impact factor 2.554)

11. Theoretical Evaluation of Global and Local Electrophilicity Patterns to Characterize Hetero-Diels-Alder Cycloaddition of Three-Membered 2H-Azirine Ring System
    Pratibha Sharma, Ashok Kumar, and Vinita Sahu
    Journal of Physical Chemistry A (ACS Publication) 114, 1032–1038 (2010)
    (Impact factor 2.946)

12. A novel approach to the synthesis of 1,2,3-triazoles and their QSAR studies
    Pratibha Sharma, Ashok Kumar. Siya Upadhyay, Jitendra Singh and Vinita Sahu
    Medicinal Chemistry Research, (Springer) 19, 589-602 (2010)
    (Impact factor 1.271)

13. Calix[n]arenes Mediated Phase Transfer Catalytic Synthesis of Purine Derivatives
    Pratibha Sharma, Ashok Kumar, Vinita Sahu, and Jitendra Singh
    International Journal of Chemical Kinetics (Wiley Inter Science), 41, 265-274 (2009)
    (Impact factor 1.007)

14. Synthesis and characterization of transitional metals (Cu, Co, Fe) complexes of 6-Methyl-5-Arylhydrazono-2-Thio-4-Oxo-Pyrimidine
    Aushutosh Mishra, Ruchita Awate, Namrata Soni, Niyati Mishra, Ritu Soni and Pratibha Sharma
    Phosphorus, Sulphur, Silicon and Related Elements, (Taylor &Francis), 184, 2624-2635 (2009)
    (Impact factor 0.716)

15. Theoretical evaluation of the global and local electrophilicity patterns to characterize hetero Diels Alder cycloaddition in the synthesis of Isoxazolo-[4,5-e]-1,2,3,4-tetrazines
    Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
    Chinese Journal of Chemistry, (Wiley Inter Science), 27, 868-876 (2009)
    (Impact factor 0.755)

16. Frontier orbital interactions in the NDAC and IEDDAC Hetero Diels Alder cycloaddition of diazadienes
    Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
    Canadian Journal of Chemistry, (NRC Press, Canada) 86, 384-394 (2008)
    (Impact factor 1.242)

17. Diels Alder reaction strategy to synthesize 1, 2, 4, 5- tetrazines and exploration of their anti-inflammatory potential
    Pratibha Sharma, Ashok Kumar, Vinita Sahu and Jitendra Singh
    ARKIVOC Arkat, (USA) (xii) 218-225 (2008)
    (Impact factor 1.252)

18. Synthesis and characterization of metal complexes of 3-(N-phenyl)-thiourea- pentanone-2
    Aushutosh Mishra, Pratibha Sharma, Namrata Soni, Ruchita Awate
    Journal of Coordination Chemistry, (Taylor & Francis), 61(22), 3687–3692 (2008)
    (Impact factor 1.547)

DR. SAVITA KHARE

1. Oxidation of cyclohexene catalyzed by Cu(Salen) intercalated α-zirconium phosphate using dry tert-butylhydroperoxide
   Savita Khare, Rajendra Chokhare
   Journal of Molecular Catalysis A: Chemical 353–354 (2012) 138.
   Impact Factor: 2.872

2. Synthesis, characterization and catalytic activity of Fe(Salen) intercalated α -zirconium phosphate for the oxidation of cyclohexene
   Savita Khare, Rajendra Chokhare
   Journal of Molecular Catalysis A: Chemical 344 (2011) 83– 92.
   Impact Factor: 2.872

3. Detection and quantification of organics in ground water by FTIR and GC-MS in and around GIDC, Ankaleshwar..
   S. V. Mahajan, Savita Khare and V.S. Shrivastava
   Asian Journal of Chemical and Environmental Research, 4 (3-4) (2011) 56-62.
   ISSN No. : 09743049
4. Hazardous metals in pesticides industrial wastes and their correlation and regression,
   S. V. Mahajan, Savita Khare and V.S. Shrivastava
   Asian Journal of Chemical and Environmental Research, 4 (2011) 20-23.
   ISSN No. : 09743049

5. Spectrophotometric detection method of micro amount of nitrite in water samples.
   Savita Khare and S.V. Mahajan
   Journal of Environmental Research and Development, 3 (4) (2009) 1164
   ISSN No.: 0973-6921
6. Study of Manganese(II) supported Titanium Tungstate as catalyst for epoxidation of cyclohexene with dry TBHP.
   Savita Khare and Rajendra Chokhare
   Journal of Environmental Research and Development, 2(4) (2008) 537
   ISSN No.: 0973-6921

3.4.3 Details of faculty serving on the editorial boards of national and international journals : Yes,

Dr. H.P.S. Chauhan and Dr. Ashok Kumar

Faculty serving as members of steering committees of international conferences recognized by reputed organizations / societies : **No**

3.4.4 Details of research awards received by the faculty and students

- Prof. K.K. Pandey Awarded **Alexander von Humboldt** Fellowship
- Prof. Ashok Kumar awarded **Indo- Hungarian** exchange fellowship.
- Dr. Ashok Kumar and Mr. Pankaj Patidar have been awarded by "**Best Science Research Award of MPCST in 2012"**
- Sheenu Bhadouriya awarded in 2nd Bhartiya Vigyan Sammelan in 2009
- National and international recognition received by the faculty from reputed professional bodies and agencies
- Dr. Pratibha Sharma and Dr. Vinita Sahu have been awarded by "**Best Science Research Award of MPCST in 2010"**

A. Number of successful M.Phil. and Ph.D. scholars guided per faculty during the last four years : Following students have been awarded Ph. D.

(1) Dr. Siya Upadhyay (2008)
(2) Dr. Rajeev Dixit (2009)
(3) Dr. Samidha Saxena (2010)
(4) Dr. Anju Das Manikpuri (2010)
(5) Dr. S. V. Mahajan (2010)
(6) Dr. Purti Bilgaiyan (2011)
(7) Dr. Sumit Bhatiya (2011)
(8) Dr. Lal Kumar (2011)
(9) Dr. Vinita Sahu (2011)
(10) Dr. Rajendra Chokhare (2012)
(11) Dr. Bhagwan Lal Kalal (2012)
(12) Dr.Abhilasha Bakshi (2013)

B. University participate in *Shodhganga* by depositing the Ph.D. theses with INFLIBNET for electronic dissemination through open access: No

A. Record of Promotion e interdisciplinary research

B. Number of interdepartmental / interdisciplinary research projects undertaken

C. Mention the number of departments involved in such endeavours -**IUC and School of Physics**

3.4.5 List of University instituted research awards to the faculty of the Department

Dr. Ashok Kumar has been awarded by **"Best Science Research Award of MPCST in 2012"**

3.5 Consultancy

3.5.1 Important consultancies undertaken by the department during the last four years.

3.5.2 A. Department participation in university-industry cell

B. If yes, what is its scope and range of activities?

3.5.3 Record of publicizing the expertise of the department for consultancy services

No

3.6 Extension Activities and Institutional Social Responsibility (ISR)

3.6.1 A. Department records of sensitization of faculty and students on its Institutional Social Responsibilities: **Orientation program was organized for newly admitted students on September 03, 2012 in University Auditorium.**

B. List the social outreach programmes which have created an impact on students' campus experience during the last four years

Faculty and Students supports following socially responsible activities-

i) Blood Donation Camp

ii) Khan River Cleanliness

iii) Green Policy Efforts

3.6.2 Promotion of neighborhood network and student engagement and holistic development of students and sustained community development?-**We encourage our students to engage themselves in socially responsible activities for their holistic development.**

3.6.3 Record of participation of the students and faculty in extension activities including participation in NSS, NCC, YRC and other National/ International programmes- **No documentary record.**

3.6.4 Records of tracking the students' involvement in various social movements / activities which promote citizenship roles- **Involvement of students in blood donation camps and green policy efforts are the activities, which reflect their role as good citizens.**

3.6.6 Write up of the values inculcated and skills learnt during extension activities.

Extension activities resulted in inculcating good moral value among the stakeholders. In our residential areas we keep friendly environment by various activities like utilizing waste water and consuming less water. We communicate society to keep the greenery around us by more plantations.

3.6.7 Department community in its outreach activities

Our dept. adheres to follow the activities mentioned in green calendar of the university to make our department and campus eco friendly.

3.6.8 Details of awards received by the institution for extension activities and/contributions to social/community development during the last four years

The school organized a lecture of Prof. R.M. Choukse , Ex. Director, Industrial Health & safety , Govt. of Madhaya Pradesh on National Safety Day.

3.7 Collaboration

A. MOU Copies and Record of collaboration with other agencies impacted the visibility, identity and diversity of activities on campus

B. Record of benefits academically and financially because of collaborations
A large number of International papers have been published by School.

3.7.2 Records of linkages resulted in
(1) Research
(2) Publication
List of Research collaboration and Publications are attached.

3.7.3 A. Copy of MoUs with institutions of national/international importance/other universities/ industries/corporate houses etc. - **MoU of University with UGC DAE CSR and RRCAT**
B. Record of enhanced the research and development activities

3.7.4 Have the university-industry interactions resulted in the establishment / creation of highly specialized laboratories / facilities? **Task force has been established in 2012 for University-Industry interaction.**

3.7.5 Any other information regarding Research, Consultancy and Extension, which the university would like to include.

Collaborative Research work Prof. K. K. Pandey :

(1) Prof. G. Frenking
Faculty of Chemistry,
University of Marburg,
Germany

(2) Prof. Phillip P. Power
Department of Chemistry
University of California Davis
USA

(3) Prof. Agusti Lledos
Department of Chemistry,
University of Autonoma Barcelona, Spain

(4) Prof. F. Maserus
Institute of Chemical Research of Cataonia (ICIQ),
Tarragona, Spain

(5) Dr. D. G. Musaev
Director
Emerson Centre for Scientific Computation,
Emory University, USA

(6) Prof. D. C. Liotta
Editor: J. Medicine Chem. Letters (American Chemical Society, USA)
Department of Chemistry,
Emory University, USA

(7) Prof. Simon Aldridge
Department of Chemistry,
Oxford University, UK

(8) Prof. Holger Braunschweig
Department of Chemistry,
University of Wurzburg, Germany

(9) Prof. Cameron Jones
School of Chemistry
Monash University, Australia

CRITERION IV: INFRASTRUCTURE AND LEARNING RESOURCES

4.1 Physical Facilities

4.1.1 A. Details of Department physical infrastructure: Basic infrastructure is available

- HOD room
- Faculty rooms
- Office
- Classrooms with ICT
- Girls common room
- Research labs
- Computer laboratory
- Seminar room

B. Maintenance of Laboratories for its optimal utilization: **Planned in 2013-14.**

C. Maintenance of Computers for its optimal utilization:
1. Maintenance regular
2. Also 30 new more computers- Planned in 2013-14.

D. Maintenance of UPSs, Power Supplies: **Power supply in the form of online UPS required for computer lab.**

C. Maintenance of support services, sanitation, first aid boxes: **Common facility of University is available.**

D. Maintenance of building, garden, indoor games structure : **More construction is required**

4.1.2 Record of new initiatives for Infrastructure for promote a good teaching-learning environment- Internet, Wi-Fi, Power Point Projectors, Video Equipment: **Internet facility and Projectors are available.**

4.1.3 Physical ambience for the faculty in terms of adequate research laboratories, computing facilities and allied services : **Available**

4.1.4 List of Facilities like office room, common room and separate rest rooms for women students and staff:

- **Common rooms- Girls Common Room available.**
- **Infrastructure in the form of building is not sufficient- Planned in 2013-14.**
- **Additional 20,000 sq. ft separate Building for research activity of faculty members and sitting space for 10 faculties- planned in 2013-14.**

4.1.5 List of the infrastructure facilities for disabled-friendly:

1. Ramp is planned in 2013-14.

2. Internet for Blind students available at IT centre.

4.1.8 Departmental special facilities are available on campus to promote students' interest in sports and cultural events/activities- **Common facility is available**

Library as a Learning Resource

4.2.1 Details of departmental library facilities:

Books of Rs 05 lakhs from UGC XI plan has been purchased through Central library.

4.2.2 Provide details of the departmental library:

Total area of the library (in Sq. Mts.): **240 Sq. Mts. (Adequate area is available for intake of 60 seats)**

Total seating capacity: **Sufficient at the moment.**

Working hours (on working days, on holidays, before examination, during examination, during vacation): From 9:00 am to 5:30 p.m.

Layout of the library (individual reading carrels, lounge area for browsing and relaxed reading, IT zone for accessing e-resources): **Available in the form of lounge area**.

Clear and prominent display of floor plan: **No**

Adequate sign boards: **No**

Fire alarm: **No**

Access to differently-abled users: **Yes**

Mode of access to collection: **Yes**

4.2.3 Departmental library holdings:

Print (books, back volumes and theses)

No. of Volumes = **966**

No. of Titles =**710**

Average number of books added during the last three years-**150**

Non Print (Audio Video, CDs, Downloaded Articles)-**No**

Electronic (e-books, e-journals)

Special collections (e.g. text books, reference books, standards, patents)

- School Library is very rich in number of books. Latest books and Journals shall be increased.
- Internet facility is available round the clock for faculty members and shall be continued in future also.
- Excess of e-journals has been provided to the faculty members as well as research scholars through internet and will remain continued.
- The class rooms are equipped with multimedia projectors and faculties are encouraged to use these aids in teaching, tutorials and seminars.
-

.2.4 Records of tools the library deploys to provide access to the collection –

Through Central Library-

- OPAC
- Electronic Resource Management package for e-journals
- Federated searching tools to search articles in multiple databases
- Library Website
- In-house/remote access to e-publications
- Excess of e-journals has been provided to the faculty members as well as research scholars through internet and will remain continued.

4.2.5 Use of ICT deployed in the library: **Through Central Library internet facility is available round the clock for faculty members.**

- Library automation
- Total number of computers for public access
- Total numbers of printers for public access
- Internet band width speed □ 2mbps □ 10 mbps □ 1 GB
- Institutional Repository
- Content management system for e-learning
- Participation in resource sharing networks/consortia (like INFLIBNET)

4.2.6 Details (per year) with regard to

Ratio of library books to students enrolled: **8:1** in Dept. library

Average number of books added during the last four years**: 643 in central library for Chemical Sciences.**

Assistance in searching Databases – **Through Central library**

INFLIBNET/IUC facilities

- School Library is very rich in number of books. Latest books and Journals shall be increased.
- Internet facility is available round the clock for faculty members and shall be continued in future also.
- Excess of e-journals has been provided to the faculty members as well as research scholars through internet and will remain continued.
- The class rooms are equipped with multimedia projectors and faculties are encouraged to use these aids in teaching, tutorials and seminars.

Annual departmental library budget and the amount spent for purchasing new books and journals.=

- Amount spent for purchasing new books from UGC XI plan grant= Rs. 5 Lakh
- Budget of UGC plan expected in XII plan= Rs. 10 Lakh

4.3 IT Infrastructure

4.3.1 Details of Department IT and ICT Infrastructure: **Central Facility is available**

4.3.2 Details of the computing facilities i.e., hardware and software.

Number of systems with individual configurations

All teachers are equipped with Computer and Internet connections

Computer-student ratio: **1:6**

Dedicated computing facilities: **Programming**

LAN facility: **Available**

Proprietary software: **Yes , Gaussian Program – Two (02)**

Number of nodes/ computers with internet facility: **Twelve (12). All computers of faculty are connected with Internet facility.**

4.3.3 Plans and strategies for deploying and upgrading the IT infrastructure and associated facilities

Up gradation of existing computer lab with some newer system of higher configuration is planned. Also deployment of some new software is planned.

4.3.4 Details on access to on-line teaching and learning resources. **Online resources and information database Knowledge are provided to the staff and students for quality teaching, learning and research.**

4.3.5 IT facilities available to individual teachers for effective teaching and quality research

Every faculty member has been allotted a system with internet facility.

4.3.8 A. Details of ICT-enabled classrooms/learning spaces available -**04**

B. Record of utilization for enhancing the quality of teaching and learning- **Power point presentations are available as record. Also student feedback copies and analysis available**

4.3.9 Records of Faculty and computer- aided teaching-learning materials – **PPTs and Student feedbacks are available**.

4.3.10 Department availing of the National Knowledge Network connectivity- **Yes, We are availing the National Knowledge Network Connectivity. We have access to various journals from ACS, Elsevier and many more.**

4.3.12 Record of Availing of web resources such as Wikipedia, dictionary and other education enhancing resources- **Yes we are accessing these educational resources for teaching and research purpose.**

4.3.13 Department budget for the update, deployment and maintenance of computers**-**

4.3.14 Details of plans envisioned for the gradual transfer of teaching and learning from closed university information network to open environment – **Planned for 2013-14.**

CRITERION V: STUDENT SUPPORT AND PROGRESSION

5.1 Student Mentoring and Support

5.1.1 Department system, structural and functional characteristics for student support and mentoring

Focus of School of Chemical Sciences is on capacity-building of students and accordingly variable levels of learning are identified and actively nurtured. Mentoring Concept is the process of implementation and focusses on overall development of the students.

5.1.2 Record of 'apart from classroom interaction', the provisions available for academic mentoring

Academic mentoring is implemented in School of Chemical Sciences in formal as well as informal mode. Students have the liberty to approach the teacher in their respective rooms or even in corridors. Students are encouraged to formulate their road-maps for academic growth.

5.1.3 Record of department student's utilization of personal enhancement and development schemes such as career counseling, soft skill development, career-path-identification, and orientation to well-being for its students.

School of Chemical Sciences recognizes the fact that higher education in 20th century was process-oriented whereas that in 21st century is result-oriented. Accordingly, measures are taken to familiarize the students with contemporary requirements and appropriate nurturing activities oriented towards career counseling; soft-skill development and career path identification are organized from time to time.

5.1.4 Department publish its updated prospectus and handbook info annually on website and online access of course plans, syllabi and result- **Yes at weblink www.dauniv.ac.in**

5.1.5 A. Records of the Timely dissipation of financial aid: **Yes, executed in full spirit.**

A. Tables for type and number of scholarships/free-ships given to the students during the last four years in the following categories: UG/PG/M.Phil/Ph.D./Diploma/others

	M.Sc.		Ph.D.	
Year	No. of Scholarships	Name of Scholarships	No. of Scholarships	Name of Scholarships
2012-13	SC	Postmetric	SC	
	ST	Postmetric	ST=1	NET-JRF CSIR (Mr. Pankaj Bariya)
	OBC	Postmetric	OBC	
	Others	----------	Others=1	JRF -SRF DRDO (Mr.Prabal Bandopadhyay)
2011-12	SC	Postmetric	SC=1	JRF SRF RGNFS (Mr.Rajendra Chokhare
	ST	Postmetric	ST	

	OBC	Postmetric	OBC=1	JRF UGC (Mr.Jaswant Carpenter)
	Others	----------	Others	JRF MPCST (Mr.Prabhakar Sharma)
2010-11	SC	Postmetric	SC	
	ST	Postmetric	ST	
	OBC	Postmetric	OBC=2	NET-JRF UGC (Pankaj Patidar) NET JRF/SRF CSIR (Ms.Vinita Sahu)
	Others	----------	Others=1	JRF UGC (Mr.Sumit Bhatia)
2009-10	SC	Postmetric	SC	
	ST	Postmetric	ST	
	OBC	Postmetric	OBC=2	JRF CSIR (Mr.Bhagwan Lal Kalal)
	Others	----------	Others=1	JRF DST (Mr.Lal Kumar) SRF CSIR (Ms.Samidha Saxena)

5.1.6 Table of percentages of students receive financial assistance from state government, central government and other national agencies (Kishore Vaigyanik Protsahan Yojana (KVPY), SN Bose Fellow, etc.)- **NIL**

5.1.7 Department use of International Student Cell, number and list of foreign students- **A task force has been set up in 2012 for international co-operation.**

5.1.8 Department support services available for

A. Students participating in various competitions/conferences in India and abroad
Yes, Consultation and guidance provided to students, wherever applicable.

B. Physically challenged / differently-abled students
Student Welfare Section and Financial Assistance
Department also provides support to Physically Challanged students in true spirit. Consequently students have been able to upgrade their career path. Evidences- Dr. Rajesh Patidar- after completing his Ph.D. from CSMCRI, Bhavnagar is currently working as Scientist 'B' there.

C. SC/ST, OBC and economically weaker sections;**State Govt.scholarships**

D. Health centre, health insurance etc. :**Facility of Health centre is 20 m away from the department.**

E. Skill development (spoken English, computer literacy, etc.) **Language laboratory facilities and IT centre to develop computer skills are nearby to the department.**

F. performance enhancement for slow learners

Special efforts were carried out by teachers to enhance conceptual clarity. Knowledge gaps for slow learners are identified and practice sessions enhanced to enrich knowledge acquisition.

G. Exposure of students to other institutions of higher learning/corporates/business houses, etc. - Students of dept. have an exposure through attending educational programs at institutes of higher learning.

- Mr. Jaswant Carpenter attended continuing education and quality improvement program at IIT Bombay
- Mr. Premansh Dudhe attended Workshop on Sophisticated Analytical Instruments at IIT Indore.

H. publication of student magazines-**NIL**

I. Record of student participation in sports and extracurricular activities

i) **Our department students participate in various extra-curricular activities on different occasions such as Group Dance competition, essay writing and as team member(s) in organizing various events in university auditorium.**

ii) **Students participate in various sports activity (Cricket, Badminton, Chess, Volley ball) organized by UTD sports organizing committee. Volley ball team of our department has been awarded 1st runner up prize in February-March 2013.**

5.1.9 Placement Records**- Reasonably attractive opportunities for students which has a combination of driving efforts of students themselves along with some inputs from faculty members. This has been a regular practice; record keeping is planned from 2013-14.**

5.1.10 Number of students selected during campus interviews by different employers (list the employers and the number of companies who visited the campus during the last four years).- **Nil**

5.1.11 A. Record of registered Alumni Association-**University registered alumni. No official registration. Alumni are connected through e mails, telephonic talks and weblinks.**

B. Record of activities and contributions to the development of the department-**Intellectual and placement support rendered to students as and when required.**

C. Record of alumni meets-**None at moment; record keeping is planned from 2013-14.**

5.1.12 A. Committee members and record of student grievance redressal- **University and Department both have Grievance redressal cell.**

B. Details of the nature of grievances reported and the redressal – **No grievance reported so far.**

5.1.13 A. Record of anti-ragging committee- all faculty members is in anti-ragging committee of the department.

(1) Dr. K.K. Pandey
(2) Dr. R. Prasad
(3) Dr. A.V. Bajaj
(4) Dr. Ashok Kumar
(5) Dr. H. P. S. Chauhan
(6) Dr. Mrs. Sheela Joshi
(7) Dr. Mrs. Pratibha Sharma
(8) Dr. Mrs. Savita Khare

C. List of instances reported during the last four years and what action has been taken in these cases

5.1.14 Details of the cooperation rendered by parents, industry and its stakeholders to ensure the overall development of its students

5.1.15 List of participation of women students in intra- and inter-institutional sports competitions and cultural activities – **Women students participate in interdepartmental UTD sports activities like Chess, Badminton.**

(1) **Sarabjot Kaur**
(2) **Gagandeep Kaur**
(3) **Richa Shukla**
(4) **Priyanka Garg**
(5) **Radhika Birle**
(6) **Pallavi Patidar**
(7) **Neha Soni**

5.2 Student Progression

5.2.1 Analysis of progression and trends for the last four years.

Student Progression	**%**
UG to PG*	**Nil**
PG to M.Phil.*	**Nil**
PG to Ph.D. 2012-13 2011-12 2010-11 2009-10	 10% 02% 04% 10%
Ph.D. to Post-Doctoral	**Nil**
Employed • Campus selection • Other than campus recruitment	No Official Record

5.2.2 Program-wise pass percentage during the time span stipulated

Year	Course		No. of students passed in stipulated time	Total No. of students
2011-13	M.Sc.	Chemistry	16	16
		Applied	10+1(Medical reason)	11
		Pharma	13	13
2010-12	M.Sc.	Chemistry	17	17
		Applied	12 (one candidate did not appear in the exam owing to medical reason)	13
		Pharma	14	14
2009-11	M.Sc.	Chemistry	14	14
		Applied	13	13
		Pharma	15	15

5.2.3 Records of Number and percentage of students who appeared/qualified in examinations like UGC-CSIR-NET, UGC-NET, SLET, ATE / CAT / GRE / TOFEL / GMAT / Central / State services, Defense, Civil Services, etc.

1. Mr.Pushpendra Kushwah has qualified State Civil Services examination in 2010 and appointed as Assitant Commissionar, Cooperative Societies in Govt. of M.P.
2. Mr. Narain Rawal has been selected for Sub-inspecotor of police by state level test organized by Vyapam.
3. Following students have been qualified for NET/ GATE during last four years. Faculty members are taking tutorials to assist weak students for their learning and to help good students for their preparation in NET/GATE examinations.
   (1) Pankaj Patidar UGC-NET (OBC) [2009]
   (2) Vinita Sahu CSIR-NET (OBC) [2009]
   (3) Premansh Dudhe CSIR-NET (OBC) [2010]
   (4) Anil Yadav CSIR-NET (OBC) [2011]
   (5) Pankaj Baria CSIR-NET, JRF (ST) [2012]
   (6) Monika Ahuja GATE(UR) [2011]
   (7) Pramod Kumar Gavel GATE (OBC) [2012]
   (8) Kuber Singh Rawat GATE (OBC) [2012]
   (9) Sunil Kumar Patidar GATE (OBC) [2011]
   (10) Sarabjot Kaur CSIR-NET [2013] All India Rank -7
   (11) Pallavi Gupta CSIR-NET [2013] All India Rank -13

5.2.4 List category-wise with details regarding the number of Ph.D./D.Litt./D.Sc. theses submitted/ accepted/ resubmitted/ rejected in the last four years

Year	Ph.D. Thesis Submitted	Awarded	Rejected
2013	02	-	-
2012	-	06	-
2011	-	03	-
2010	-	02	-
2009	-	01	-

5.3 Student Participation and Activities

5.3.1 A. List the range of sports, cultural and extracurricular activities available to students
Following Out-door and in-door sports and extracurricular activities are available to students in UTD campus:

i) Cricket, Badminton, Volley ball, Table Tennis, Chess, Athletics.
ii) Debate, Essay writing, extempore speech.
iii) Dance, Drama, Music.

B. Sports and extracurricular calendar and details of students' participation – Calendar available on website – **www.dauniv.ac.in**, Details of participation are given in 5.1.8 I.

5.3.2 Details of the achievements of department students in co-curricular, extracurricular and cultural activities at different levels: University / State / Zonal / National / International, etc. during the last four years - given in 5.1.8

5.3.3 A. Gathered data and feedback from pass-out graduates
B. Gathered data and feedback from employers:
C. Use of the data for the growth and development of the department
Available in feedback register. Appropriate actions have taken.

5.3.4 Department special drives / campaigns for its faculty and students to promote heritage consciousness
Student campaign was organized by the University to promote heritage consciousness. Departmental students have participated in one of such activities viz. "International River Festival", held at Hosangabad on March 24, 2013.

5.3.5 A. Records of Department involvement and encourage its students to publish materials like catalogues, wall magazines, departmental magazine, and other material
Students have been encouraged to participate in these artistic activities. They also prepare a folder of synthesized chemical samples in order to submit them at the end of semester.
B. List the major publications/ materials brought out by the students during the last four academic sessions.
Research students of the department are exahaustively involved in publishing their research work in various journals of high repute.

5.3.6 A. Departmental Student and Alumni association or any other similar body
B. Details on its constitution, activities and funding.
School of Chemical Sciences has initiated steps to build an alumni base which is expected to give inputs from different work cultures and environment for upcoming scientific talents of the department. Feedback and suggestions of alumni is properly recorded and appropriate measures are taken.

5.3.7 Details of student representatives in Board of Studies, various academic and administrative bodies: **None at the moment; planned in 2013-14.**

5.3.8 Any other information regarding Student Support and Progression which the university would like to include**.** **No**

CRITERION VI: GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.1 Institutional Vision and Leadership

6.1.1 State the vision and the mission of the department in line with the University

Vision:

To create an academically sound environment that nurtures, motivates and inspires excellence in research and teaching in chemical sciences along with concern for society

Mission:

To impart theoretical and practical training in advanced areas of chemical Sciences and contribute new knowledge through research which encourages creativity, insight development and a passion for science

6.1.2 Mission statement definition for the department's distinctive characteristics in terms of addressing the needs of the society, the students it seeks to serve, the institution's tradition and value orientations, its vision for the future

- **Our school's mission is to render an environment that nurtures, motivate and inspires excellence in research and teaching.**
- **We believe in putting efforts to generate intellectual and socially responsible human beings.**
- **We impart training to the students in advanced areas of chemistry and contribute the knowledge to develop globally competent professionals.**

6.1.3 Write-up of

Ensuring the organization's management system development, implementation and continuous improvement:

The working pattern of School of Chemical Sciences has intense respect for quality issues in higher education and displays strong commitment towards thorough execution coupled with ground realities.

Interacting with its stakeholders:

Periodic inputs from students are taken about relevance and utility of curriculum and accordingly appropriate upgradation /modification is undertaken.

Reinforcing a culture of excellence:

Passion for improvement of curriculum along with adoption of quality inputs compatible with intellectual contributions is outrightly recognized as principle drive for excellence.

Identifying organizational needs and striving to fulfill them

Our department works very methodically. All the stakeholders of the department i.e. alumni, parents, employers, research organizations and higher education institutions, render a co-operative atmosphere for overall academic growth. We resolve all important issues in department meetings. We take feedback and need based suggestions from the students and staff for further improvements in academia and infrastructural facilities.

6.1.4 Records of Departmental and other committees meetings: **File no 6.1**

6.1.5 Write-up of a culture of participative decisions in the department:

We take all the decisions, pertaining to all the curricular and academics related issues, in the Departmental meetings scheduled regularly. Also, faculty members participate as the Committee members to fulfill the tasks of various assignments assigned to them.

6.1.6 Record of grooming leadership at various levels

Leadership skills can be seen in the department in its varied and decentralized manner. Class representatives monitor the discipline in the classrooms. Faculty members and non-teaching staff members assist in organizing various department level affairs. For example, Dr. Sheela Joshi is holding the prestigious position of Member, Executive Council, Dr. A. V. Bajaj is the coordinator to conduct NET examination in the University, Dr. Pratibha Sharma and Dr.Savita Khare were the convener and co-convner, respectively to organize the national level seminar; Mr. S. R. Azad and Mr. Atul Bhardwaj are the incharges of sophisticated instruments; Mr. R.B. Yadav is the incharge of office work ,Mr. S. B. Yadav maintains garden ,Mr. A. Sharma, Mr. Amarjeet, Mr. Soni, Mr. Ramesh Sulya assist in the laboratory and other office support work. Mrs. Preeti maintains cleanliness in the department.

6.1.7 Record of knowledge management strategy:

School arranges the seminars at student level to groom their personality. Also, assignments, tutorials, thoughts provoking lectures, discussions/counseling with the students, and repository of CDs, video lectures, and e-books are the key features to knowledge management strategy in the department.

6.1.8 Write up on contributing to national development

We understand that every stakeholder of the department is the key component to the nation building. Keeping this ideology in mind, our department put in efforts to train the students that they may be able to contribute to national development. It has been reflected through our well placed alumni in various positions of the country.

Fostering global competencies among students:

School's aim is to provide high quality education and research training to the students with a vision of fostering global competencies in them .School guides them to become good academicians /scientists /corporate to serve at both national and global levels.

Inculcating human values in students

School imbibes good human values in the studentsare the key to success in every walk of life. The moral ethics among the students are inculcated.

1. Lecture series on Mahamana Madan Mohan Malviya ji was held on 06/11/2012 and 11/12/2012 Dr.Karn Singh, Hon'ble Justice Girdhar Malviya, and Mrs. Kanta Malviya were the speakers.

2. Lecture series on Swami Vivekanand's contribution was held on 12-1-13

3. Bharat Ratna Dr.A.P.J. Abdul Kalam was invited .He delivered message to greatly inspire the students on June 12, 2013.

Promoting use of technology

We provide high quality education and training to the students for high flying careers in Chemical Sciences. In this regard the actual practical work –exposure to use various technological devices enhances their confidence level. Our students have gained hand on training to operate various laboratory instruments and proficiency to run the computer programs. School has computer lab and it is being used for the teaching of basic computer/programming skills as per the need of the course curriculum of M. Sc. courses. Besides, other significant features include:

1. **Theoretical and practical knowledge of Instrumental Techniques.**
2. **Interpretation of various types of spectra-**
   a) **Nuclear Magnetic Resonance, (NMR)**
   b) **Electron Spin Resonance (ESR)**
   c) **Infrared (IR)**
   d) **Ultraviolet-Visible (UV-Visible)**
   e) **Mossbauer Spectroscopy**
   f) **Mass Spectrometry.**

Quest for excellence

School gives up-to-date knowledge of broad range of disciplines of chemical Sciences to produce keen analytical minds cultivated in a challenging environment.

6.2 Strategy Development and Deployment

6.2.1 Perspective plan for development and write-up of policies and strategies to work for Vision and for achieving the mission

Our faculty members are highly dedicated and committed to achieve the targeted goals of the mission

Enhancing Teaching and learning

Our faculty members impart high quality advance knowledge to the students. They keep themselves updated through consulting latest books, journals, web knowledge. Faculty members regularly participate in seminars/workshops/symposia at national and international levels. They share their experiences and knowledge gained through such an exposure with the students.

Enhancing Research and development:

Faculty members of the department are doing high quality research in various domains of chemical sciences. This is reflected through a number of publications in the journals of international repute with high impact factor. Some of the faculty members are doing collaborative research with national and international organizations both. Also, at times they visit foreign Universities in context of their research collaborations. The faculty is extremely well qualified and motivated with a strong commitment to research, which is reflected in the number of projects sponsored by Department of Science and Technology, University Grants Commission, Council of Scientific and Industrial Research, Defense Research and Development Organization.

Enhancing Community engagement:

Whenever needed we give suggestions to the parents and counsel the visitor students.

Enhancing Human resource planning and development:
As per the requirement, University provides support to the department.

Enhancing Industry interaction:
The department has good interactions with various industries viz., Ranbaxy, Grasim, IPCA etc. A number of students of this school are holding prestigious positions in various industries viz., Ranbaxy (Dewas), Ranbaxy (Gurgaon), Sai-Advantium, Dabur, Cipla, Dr.Reddy's, Alembic, Sun Pharma, Jubilant Pharma etc.

Enhancing Internationalisation
Research contribution of faculty members has been widely acclaimed by the scientific community around the world and has appeared as a new chapter in advanced textbooks and reference books. Faculty members are doing collaborative research with some foreign institutions viz., Germany, Hungary, USA

6.2.2 Departmental organizational structure and decision making processes and their effectiveness.
Department comprises of Head of the Department (who is accountable for overall responsibility to run the department), faculty members, and non- teaching staff members. All the faculty members follow the instructions and orders given by the HOD and participate in various decision making policies. Non teaching staff supports in variety of ways in the administrative/official functioning of the department.

6.2.3 Write up of functioning independently and autonomously and ensure accountability
We have the freedom to work independently and autonomously.
This is manifested as follows:

- **Separate entrance examination for admission in various courses**
- **Autonomy to conduct examination at department level (as per Ordinance no.31)**
- **Independent research practices and publications**
- **Strict adherence to the University rules and regulations (accountability)**

6.2.4 Record of last four years, have there been any instances of court cases filed by and against the department, what were the critical issues and verdicts of the courts on these issues: **NA**

6.2.5 Performance audit of the department by external experts:
In order to evaluate the overall outcome of the department, performance audit was carried by two external experts. They gave satisfactory opinion about the work culture and resulted outcome of the department.

6.3 Faculty Empowerment Strategies

6.3.1 Outcome of the reviews of self appraisal and PBAS and important decisions taken on that
All faculty members have submitted their self appraisal and PBAS to University. Faculty has excellent research publications and very good performance in teaching-learning process.

6.3.2 List of teachers availing welfare schemes available for teaching and non-teaching staff.
Some of the teachers are availing the facilities of welfare schemes meant for the staff of the University. A teacher welfare fund is built by 4% contribution from examination remuneration.

6.3.3 List and number of attracted and retained eminent faculty in last 4 years: **Nil**

6.3.4 Gender audit during the last four years of the department achievements and pass percentages and its salient findings.

Year	Course	Female pass percentage	male pass percentage	A/A+ Female pass percentage	A/A+ male pass percentage
2011-13	M.Sc.	53%	47%	-	-
2010-12	M.Sc.	57%	43%	-	-
2009-11	M.Sc.	52.66%	47.33%	7%	
We strictly follow the gender reservation policy of the government.					

6.4 Financial Management and Resource Mobilization

6.4.1 Statements of audited income and expenditure of academic and administrative activities of the last four years.

Available in University

6.4.2 Efforts taken by the department for resource mobilization- Faculty members are encouraged to write research proposals to get funds from various funding agencies viz., CSIR, DRDO, UGC, and DST.

6.4.3 Record of endowment funds created

Available in University

6.5 Internal Quality Assurance System

6.5.1 Details of department internal quality assurance and sustenance system, give details.

Department has its own internal quality assurance cell comprises of faculty members:

a. Prof. R.Prasad, **Head**
b. Prof. A.V.Bajaj **, Chairman IQAC**
c. Prof. H.P.S.Chauhan
d. Prof.Sheela Joshi
e. Prof.Pratibha Sharma

6.5.2 Internal workshops to improve teaching, learning and evaluation:

We organize seminars, interactive sessions with a view to observe better impact of teaching, learning and evaluation.

6.5.3 Record of continuously review the teaching learning process

Student's feedback was analyzed as a consequence to teaching –learning process. Overall rating of the faculty members was very good. Record of feedback forms is available in the department.

6.5.4 Any other information regarding Governance, Leadership and Management which the university would like to include**.**

CRITERIA VII: INNOVATIONS AND BEST PRACTICES

7.1 Environment Consciousness

7.1.1 Department Area Green Audit details:

The department premise has two gardens on its front left and right sides with lush-green grass mattress .Here the students enjoy their supper here and spend the extra time for studying and discussing with each other.

Also, the laboratory experiments for M.Sc. students were designed keeping into consideration the Greener and Cleaner Chemistry approach derived from the Twelve Principles of Green Chemistry suggested by Paul Anatas (Father of Green Chemistry).

7.1.2 Departmental initiative to make the campus eco-friendly?

Energy conservation: **It is in the practice of all the stake-holders of the department to conserve energy by all means. We save water and electricity as far as possible.**

Use of renewable energy: **Many of the chemical reactions are based on the utilization of recycled water and solar energy.**

Water harvesting: We **save rain water in the containers and use it as a supplementary substitute of distilled water for laboratory purposes. Also, pit holes in the garden serve as recharging devices.**

Check dam construction: **NA**

Efforts for Carbon neutrality: **We maintain carbon footprint by cultivating a variety of plants in the vicinity of the department.**

Plantation: **This activity is a regular feature of the department. Faculty, students and non teaching staff participate in plantation activities. In view to have a natural beauty, efforts towards cultivation of horticultural plants were made. Beautiful turf-grass and plenty of shrubs of "Tulsi" plant (medicinal importance-highly antioxidant) are the added features in this effort.**

Hazardous waste management: **We try to avoid any hazardous agent in the department. Moreover, any such hazardous material has been disposed after its neutralization by chemical means.**

E-waste management: If **there is any e-waste, initially it is stored in a proper room followed by its disposal to appropriate place taking into account the defined official procedure.**

7.2 Innovations

Give details of innovations introduced during the last four years which have created a positive impact on the functioning of the department

School's mission is to provide high quality education and training for high flying career in Chemical Sciences. Our distinguishing features are:

- **Theoretical and practical knowledge of Instrumental Techniques.**
- **Interpretation of various types of spectra by the M.Sc. students.**
- **The School has achieved notable excellence in research and teaching.**
- **The faculty is extremely well qualified and motivated with a strong commitment to research.**

- **The strength of the school has been highlighted through a number of good quality publications in the journals of high impact factor. Also; the research contribution of faculty members has been widely acclaimed by the scientific community around the world.**
- **We strictly maintain the time schedule to run the academic curriculum.**

7.3 Best Practices

7.3.1 Give details of any two best practices which have contributed to better academic and administrative functioning of the department

1. Title of the Practice:

(i) Excellence in Research and teaching

(ii) Maintenance of academic schedule

2. Objectives of the Practice

What are the objectives / intended outcomes of this "best practice" and what are the underlying principles or concepts of this practice (in about 100 words)?

With regard to the practices cited above, our department considers the objectives that are stated below:

- **To help the students to come up with flying colours by providing them excellent research and classroom learning**
- **To assist the students in achieving their targeted goals**
- **To adhere to a disciplined and punctual academic schedule**

3. The Context

What were the contextual features or challenging issues that needed to be addressed in designing and implementing this practice (in about 150 words)?

In order to meet the challenges of current academic, scientific and industrial sector requirements it is needed to nourish the students very diligently so that they can opt for a career as per their desire and talent.

4. The Practice

Describe the practice and its uniqueness in the context of India higher education. What were the constraints / limitations, if any, faced (in about 400 words)?

Faculty members of the department are extremely dedicated in pursuing high quality research and benefitting the students with a high standard of teaching. This has been evidenced by a number of international and national level publications in the journals of high impact factor. Moreover, a number of scientific projects sanctioned to the faculty members from different funding agencies are the feather in the cap to justify the achievements of the department.

Keeping in view the current scenario to promote higher education in India vis-a-vis to fulfill the global needs, we train the students to meet the challenges very efficiently. Many of our students are enjoying their high flying careers at both national and international levels.

5. Evidence of Success

Provide evidence of success such as performance against targets and benchmarks, review results. What do these results indicate? Describe in about 200 words.

- **Well placed alumni in India and abroad**
- **High quality publications**
- **Research projects from different funding agencies of the country viz., CSIR, UGC,DST,DRDO,UGC, MPCST**
- **Time management in the academic schedule and official work**

6. Problems Encountered and Resources Required

(Please identify the problems encountered and resources required to implement the practice)

We need expansion in the existing infrastructural space in order to meet the requirements of the faculty, staff and the students.

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