SELF STUDY REPORT

1. Name of the Department: **Biochemistry** Faculty of Life Sciences.
2. Year of establishment: 1984.

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

Programmes	Number	Course/Subjects
UG		
PG	01	Biochemistry
Integrated Masters		
M.Phil.		
Ph.D.	01	Biochemistry
Integrated Ph.D.		
Certificate		
Diploma		
PG Diploma		
Any other (please specify)		
Total	02	

A.1.1 Details approval/recognition and recommendations issued by the statutory body (for example, (UGC, AICTE, NCTE, PCI, MCI, DCI) governing the programme in case of Professional Programmes letters for the first time and Last Academic Year recognitions: UGC, New Delhi.

If the department offers Distance Education Programmes (DEP) then
Number of programmes offered: Nil
Name of Each Programme: Nil
Letters for approvals by the Distance Education Council: N.A.

A.2 Copy of Ordinances related to the courses in the department: Ordinance 13.

A.3 Number of working days during the last academic year: 240
Number of teaching days during the past four academic years:

180	185	185	190
2009-10	2010-11	2011-12	2012-13

('Teaching days' means days on which classes were engaged. Examination days are not to be included).

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	01	03	02	04	02
Recruited	Nil	02	02	04	01
Yet to recruit	01	01	Nil	Nil	01
Number of persons working on contract basis	Nil	Nil	01	Nil	Nil

A.4.1 Qualifications of the teaching staff:

Highest qualification	Professor (MP/CAS)		Associate Professor		Assistant Professor		Total
	Male	Female	Male	Female	Male	Female	
Permanent teachers: 04							
D.Sc./D.Litt.							
Ph.D.	01	01	Nil	Nil	01	01	04
M.Phil.							
PG							
Temporary teachers: 01							
Ph.D.					01		01
M.Phil.							
PG							
Part-time teachers (Courses Visiting Faculty): 02							
Ph.D.	01						01
M.Phil.							
PG					01		01

Emeritus, Adjunct and Visiting Professors and their sanctions:

	Emeritus	Adjunct	Visiting
Number	Nil	Nil	02

A.5 Semester-wise Record of Courses of Visiting Faculty and their Sanctions:

S. No.	Academic Session	Semester	Course	Name	Qualification	Teaching/ Research/ Industry Experience	Number of hours in the Semester
1	2011-12	III	Biostat	Dr. S. Banerjee	Ph.D.	25 years	25
2	2011-12	III	Bioinfo	Sh Arun Gupta	M. Tech.	10 years	40
3	2012-13	III	Biostat	Dr. S. Banerjee	Ph.D.	26 years	25
4	2012-13	III	Bioinfo	Sh Arun Gupta	M. Tech.	11 years	40

A.6 Copies of latest biodata of Faculty in positions in the Department: File No. A.6

A.7.1. Copies of yearly performance based assessment records of Faculty in positions in the Department: Filed with University administration at the end of semester.

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

	Sanctioned	Filled
Professor	01	Nil
Associate Professors	03	02
Asst. Professors	02	02
Contract Teacher against post of Professor		01
Total	06	05

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 Experience	No. of Ph.D. students guided for the last 4 years
Dr. D. Bhatnagar	Ph.D.	Prof.	Clin Biochem.	35	05
Dr. Rekha Gadre	Ph.D.	Prof.	Plant Biochem.	33	01 (Jointly with Dr. M. Jain)
Dr. S.M. Gokhale	Ph.D.	Sr. Lect.	Membrane Biol.	20	01
Dr. Meeta Jain	Ph.D.	Sr. Lect.	Plant Biochem.	12	Nil
Dr. A. S. Yadav	Ph.D.	Cont. Teach.	Biochemistry	06	Nil

4. List of Senior Visiting Fellows, Faculty, Adjunct Faculty, Emeritus Professors: Nil

5. Percentage of classes taken by temporary faculty – programme wise information; each semester wise information: < 10 %

Percentage of classes taken by visiting faculty – programme-wise information; each semester wise information: < 10%

6. Programme-wise Student Teacher Ratio: M.Sc. 15:1

7. Number of academic support staff (technical) and administrative staff:
   Sanctioned: 02 04
   Filled: 01 04

Students	UG	PG	Integrated Masters	M.Phil.	Ph.D.	D.Litt./ D.Sc.
	*M*F	*M *F	*M *F	*M *F	*M *F	*M *F
From the state where the university is located	Nil	Pre.) 03 18 Fin.) 05 10			03 09	
From other states of India		Pre.) 00 00 Fin.) 02 06			02 05	
NRI students						
Foreign students						
Total		10 34			05 14	

A.8 Students enrolled in the department during the current academic year (2013-14), with the following details:

*M-Male *F-Female Pre.-Previous Batch Fin.-Final Batch

Externally registered students:
Yes ☐ No √ ☐
If yes, how many students avail of this provision annually?

A.7 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. 65000/-
(b) Excluding the salary component = Rs. 22000/-

A.8.A. Faculty recharging strategies: Two of the Faculty members have attended orientation and refresher courses.

B. Number and list of faculty with course details of faculty development programs, academic staff college programs or other faculty recharge programs: All the faculty members have contributed as resource persons at Academic Staff College, DAVV.

A.9 Student projects:
- percentage of students who have done in-house projects including inter-departmental projects: 4%
- percentage of students doing projects in collaboration with other universities / industry / institute: 96%

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

- Faculty:

Dr. D. Bhatnagar (i) Coordinator MPCST, Bhopal.
(ii) Reviewer of many International Journals of repute.
(iii) Member and Chairman of many selection committees for Colleges and member for other Universities.

Dr. R. Gadre: (i) Reviewer of National/International journals of repute.
(ii) Member and Chairperson of many selection committees for Colleges.

- Doctoral / post doctoral fellows: Best Science Research Award to Dr. Amit Kumar Dixit from MPCST, Bhopal in 2009-2010.

- Students: Quiz and Essay competitions are held every year by the support of MPCST, Bhopal. The following students of the Department received the prizes.

MPCST Essay Competition (2009-2010) Topic: " Vision 2020 for Science" (Hindi Category)		
1st Prize	Deepti Bhatnagar	School of Biochemistry, DAVV, Indore
MPCST Science Quiz Competition (2009-2010)		
1st Prize	Anjana Kumari and Neelofar Khan	School of Biochemistry, DAVV, Indore
MPCST Essay Competition (2010-2011) Topic: " Chemistry in Our Lives" (Hindi Category)		
1st Prize	Deepti Bhatnagar	School of Biochemistry, DAVV, Indore
3rd Prize	Vidushi Asati	School of Biochemistry, DAVV, Indore
MPCST Science Quiz Competition (2010-2011)		
1st Prize	Radhika Chinchalkar	School of Biochemistry, DAVV, Indore
MPCST Essay Competition (2011-2012) Topic: " The answer to world energy crisis" (Hindi Category)		
2nd Prize	Dharmendra Singh Damor	School of Biochemistry, DAVV, Indore
MPCST Science Quiz Competition (2011-2012)		
2nd Prize	Kaushal Singh and Surjeet Dey	School of Biochemistry, DAVV, Indore

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

2007-08 - Lectures on Biochemistry related topics were held by following Shanti Swarup Bhatnagar Awardee Scientists.

1. Dr. Shekhar C. Mande, Staff Scientist, Centre for DNA Fingerprinting and Diagnostics, Hyderabad, delivered talk on the topic "Unusual chaperonins of M. Tuberculosis in search of biological function" on 08.03.2007.

1. Dr. Javed N. Agrewala, Scientist, Institute of Microbial Technology, Chandigarh, delivered talk on the topic "Bi-directional signaling by CD80 and CD86 molecules" on 08.03.2007.
2. Dr. Gopal C. Kundu, Scientist, National Centre for Cell Sciences, Pune, delivered talk on the topic "Prognostic and Diagnostic significance of osteopontin, a member of SIBLING family of proteins in human cancers" on 08.03.2007.
3. Dr. S.K. Poddar, Professor, Indian Institute of Science, Bangalore, delivered talk on the topic "Chemical recognition in biology and mechanistic study on ribosome inactivating protein from plants for the development of immunotoxin as cancer therapy" on 08.03.2007.
4. Dr. Vinod Bhakuni, Scientist, Central Drug Research Institute, Lucknow, delivered talk on the topic "Domain structure in protein and modulation of functional activity" on 09.03.2007.
5. Dr. Valipe Ramagopal Rao, Professor, IIT-Bombay, delivered talk on the topic "Development of Bio-Nano system for cardiac diagnostics" on 09.03.2007.
6. Dr. K.B. Sainis, Scientist, BARC, Mumbai, delivered talk on the topic "Antiapoptotic and immunomodulatory properties of antioxidant chlorophyllin" on 09.03.2007.

2008-09 - Lectures were held on scientific topics by Senior Scientists.

1. Dr. Rajesh Singh, Sr. Scientist, Biochemical Engineering Group, NCL, Pune, delivered a talk on the topic "Macromolecular crystallography of proteins and methods to obtain protein structure" on 20.03.2009.
2. Dr. Vineet Kumar Sr. Scientist, Directorate of Soybean Research, Indore delivered a talk on the topic "Soybean: Nutraceutical application and research challenges" on 20.03.2009.

2009-10 - Lectures were held on scientific topics by Shanti Swarup Bhatnagar Awardee Scientists.

1. Dr. L.S. Shashidhara, Staff Scientist, CCMB, Hyderabad, delivered talk on the topic "Insect flight: an evolutionary perspective" on 17.07.2009.
2. Dr. Gopal C. Kundu, Scientist, NCCS, Pune, delivered talk on the topic "Diagnostic and therapeutic significance of osteopontin and other associated genes" on 17.07.2009.
3. Dr. Kanury V.S. Rao, Scientist, ICGEB, New Delhi, delivered talk on the topic "Genome-Wide screens to define host-pathogen interactions: An alternative approach to drug target discovery processing" on 17.07.2009.
4. Dr. Narayan Swamy Srinivasan, Professor, IISc., Bangalore, delivered talk on the topic "Evolution of protein structures functions and interactions" on 17.07.2009.
5. Dr. V. Ramagopal Rao, Professor, IIT-Mumbai, delivered talk on the topic "Polymer based sensor systems for health care and security applications" on 17.07.2009.
6. Dr. G.P.S. Raghava, Scientist, Institute of Microbial Technology, Chandigarh, delivered talk on the topic "Discovery of novel vaccine candidates using immunoinformatics" on 17.07.2009.
7. Dr. Javed N. Agrewala, Scientist, Institute of Microbial Technology, Chandigarh, delivered talk on the topic "Signalling through surface molecules: an approach to inhibit the growth of pathogens in macrophages" on 19.07.2009.

2009-10 - Lectures were held on scientific topics by Senior Scientists.

1. Dr. Vineet Kumar Sr. Scientist, Directorate of Soybean Research, Indore delivered a talk on the topic "Vegetable oil: Current Issues, Nutraceutical, and Research Challenges" on 18.03.2010.
2. Dr. Anita Rani, Principal Scientist, Directorate of Soybean Research, Indore delivered a talk on the topic "GMOs in Agriculture" on 26.03.2010.

2010-11

"International Year of Chemistry 2011" was celebrated on the theme "Chemistry in our lives", and a seminar was organized on "Clean Energy options and Nuclear safety" by the support of MPCST, Bhopal. Following speakers delivered the talks:

1. International Year of Chemistry 2011 was celebrated on the theme "Chemistry in our lives"
2. Seminar was organized on the topic "Clean Energy options and Nuclear safety" by the support of MPCST Bhopal.

The speakers and the topics were as follows:

1) Dr. R.K. Bhargava, Ex Chairman, (Retd.) Heavy Water Board, Indore. Topic: Clean Energy options and Nuclear safety.

2) Dr. S.P. Singh, Professor and Head, School of Energy and Environmental Studies, DAVV, Indore. Topic: Role of renewable energy and sustainable development.

3) Dr. Vijay Babu Gupta, Reader, School of Future Studies and Planning, DAVV, Indore. Topic: Kyoto protocol and Clean Development Mechanism (CDM).

2011 -12

Seminar on the topic "Recent Trends in Biochemistry" was held by the support of UGC, New Delhi. The speakers and the topic were as follows.

1) Dr. Pradyumna Kumar Mishra, Scientist E, Division of Translational Research, Clinical Research Centre, Tata Memorial Centre, Advanced Centre for Training, Research and Education (ACTREC), Navi Mumbai 410210. Topic: Dendritic cell engineering for cancer immunotherapy: A translational perspective.

2) Dr. Jawaid A. Khan, Professor, Dept. of Biosciences, Jamia Millia Islamia University, Jamia Nagar, New Delhi 110025. Topic: RNAi mediated resistance to begomoviruses: Status and prospects.

3) Dr. B. N. Pandey, Scientific Officer F, Radiation Biology and Health Sciences Division, Bhabha Atomic Research Centre, Mumbai 400085. Topic: Radiation induced

oxidative damage and apoptosis and its relevance in cellular radioprotection and cancer radiotherapy.

4) Dr. Om Prakash, Professor, Dept. of Biochemistry, Banaras Hindu University, Varanasi, U.P. 221005. Topic: Alpha amylase from soybean seeds: Immobilisation and application in organic media.

2012-13

A seminar was organized by School of Biochemistry, DAVV, Indore on the following topic: "Phytoremediation of Degraded Environment: Emerging Issues and Challenges" on Sept.,25, 2012. Speaker: Dr. R.P.Singh, Professor, Dept. of Environmental Sciences, Babasaheb Bhimrao Ambedkar University, Lucknow.

National Mathematics Day was celebrated on 22 December 2012, supported by M.P. Council of Science and Technology, Bhopal and organized by School of Biochemistry/Mathematics, DAVV, Indore. Dr. N. Shradha, Professor, TIFR, Mumbai delivered a talk on Analytical Number Theory.

A seminar was organised by School of Biochemistry, DAVV, Indore, on the theme "Intellectual Property Rights" on October, 13, 2012. The seminar was sponsored by M.P. Council of Science and Technology, Bhopal. The speakers and the topic were as follows.

1) Dr. G.K. Gupta, Principal Scientist, Directorate of Soybean Research, Khandwa Road, Indore. Topic: Intellectual Property Rights relevant to Indian agriculture.

2) Dr. N.K. Choubey, Scientist and Incharge, PIC, MPCST, Nehru Nagar, Bhopal 462003. Topic: Introduction to Intellectual Property.

3) Prof. Ghayur Alam, Ministry of HRD Chair, Professor of IP Law, Chairperson, Centre of Science, Technology and Law, The National Law Institute University, Bhopal 462002. Topic: An Overview of IPR spectrum in India.

4) Ms. Raunak Dubey, Executive, Intellectual Property Facilitation Centre, Confederation of Indian Industry, Indore, 452010. Topic: Success story of India related to patents.

"First University – Industry Partnership Meet" was organized by Devi Ahilya Vishwavidyalaya, Indore on February, 08, 2013.

A national seminar on "Genetically Modified Crops" supported by MPCST, Bhopal, will be held on 14.09.2013 at School of Biochemistry, DAVV, Indore. Speaker: Dr. Phundan Singh, Former Director, Central Institute for Cotton Research, Nagpur.

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

1) The department is following ethical guidelines for research.

2) The Institutional Animal Ethics Committee (IAEC) as per the guidelines of CPCSEA

is functional. All proposals for animal experimentation are submitted to the IAEC for approval.
3) Respect for Intellectual property rights of individual and institutions.
4) Explicitly acknowledge the work of others when referring to them in any shape, form or manner.
5) Follow the principles of ethical and social responsibility.

A.12 Student profile course-wise:

Name of the Course	Applications received	Selected		Pass percentage in UG exam			
				Male		Female	
		Male	Female	Min.	Max.	Min.	Max.
M.Sc. Sem I (2012-13)	N.A.	10	20	56.70	77.95	55.00	86.00
M.Sc. Sem I (2011-12)	337	16	12	57.26	86.07	61.72	80.50
M.Sc. Sem I (2010-11)	352	11	15	57.74	72.60	61.00	83.28
M.Sc. Sem I (2009-10)	272	08	21	55.80	75.17	55.22	79.98
M.Sc. Sem I (2008-09)	208	11	13	56.90	73.33	55.50	76.60

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
MSc (2012-13)	49	15	36	00
Ph.D.	48	10	42	00

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.

NET (JRF)	2012- Archana Agrawal	- General
	2011- A. Kiran Kumar	- General
	2010- Chetan Jain	- General
	2009- Kanchan Jumrani	- General
	2009- Vinay Bari	- General
ICMR (JRF)	2011- Arun Yadav	- General
NET (LS)	2012- Jayesh Vaishnav	- OBC
	2012- Neha Rani Kaul	- General
	2012- A.G.S. Chandu	- General
	2010- Komal Dixit	- General
	2009- Sudha Jaweria	- SC
GATE	2013- Manoj Kumawat	- OBC

2012- Radhika Chinchalkar - General
Pragyasheel Jat - SC
Pilendra Thakare - OBC
Satyendra S. Thakur - OBC
Ashish Mangal - General
2011- A.G.S. Chandu - General
2011- Ranjit Singh - General
2011- Manoj Kumar - OBC
2011- Chetan Jain - General
2011- Noopur Jain - General
2011- Pawan Soni - General
2010- Komal Dixit - General
2010- Deepak Singh - General
2010- Mangesh Bawankar - General
2009- Arun Yadav - General

A.15 Record of Student progression:

Student progression	Percentage against enrolled
UG to PG	
PG to M.Phil.	
PG to Ph.D.	33
Ph.D. to Post-Doctoral	
Employed • Campus selection • Other than campus recruitment	
Entrepreneurs	

A.16 Record of Diversity of staff:

Percentage of faculty who are graduates	
of the same university	75
from other universities within the State	Nil
from universities from other States	25
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: Nil

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

a) Library: 780 (File A.18.1 for list of Titles)
b) Internet facilities for staff and students: 10 nodes
c) Total number of class rooms: 03
d) Class rooms with ICT facility: 02
e) Students' laboratories: 03
f) Research laboratories: 03

The number of Titles on Biochemistry at Central library is 764 (File A.18.2 for list of

Titles).
The number of e-Journals on Biochemistry at Central library is 460 (File A.18.3 for list of Titles).
The number of Journals on Biochemistry at Central library is 10 (File A.18.4 for list of Titles).

A.19 List of doctoral, post-doctoral students and research associates:

a) From the host university: 09

Name of the doctoral students presently working:

1. Ms. Harsha Lad
2. Sh. Ankit Kelotra
3. Sh. Jayesh Vaishnav
4. Ms. Ritu Tyagi
5. Ms. Seema Kelotra
6. Sh. Prakash Malviya
7. Ms. Ankita Joshi
8. Ms. Radhika Chinchalkar
9. Ms. Vinny Punjabi

b) From other universities: 10

Name of Research Scholars presently working

1. Ms. Antariksha Tyagi
2. Ms. Deepti Bhatnagar
3. Ms. Swati Tiwari
4. Ms. Reena Rawal
5. Ms. Sonal Dhamgaye
6. Ms. Vartika Sinha
7. Ms. Priyanka Mishra
8. Ms. Samatha Gunapati
9. Ms. Vaishali Mourya
10. Sh. Sharad Saurabh

A.19 Records of financial assistance and number of post graduate students getting financial assistance from the university, UGC, State, AICTE.

Year	SC	ST	OBC
2008-09	15235/-	Nil	33910/-
2009-10	19455/-	17115/-	15945/-
2010-11	32015/-	26800/-	21095/-
2011-12	38265/-	11640/-	18320/-

A.20 Methodology of need assessment exercise undertaken before the development of new programme(s): No new programme could be introduced.

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?
   Faculty members' suggestions on curriculum obtained during meeting of Board of Studies are suitably incorporated.

b. Students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?
Feedback forms are regularly obtained from M.Sc. students at the end of each semester and analyzed. Key suggestions are considered and suitably implemented.

c. Alumni and employers on the programmes offered and how does the department utilize the feedback?
File A.21.C

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

1. Dr. Vijay Maheshwari, Professor, Director, School of Life Sciences, North Maharashtra University, Jalgaon, India. (Ph.D. 1992).
2. Dr Shubhashish Sarkar, Sr. Scientist, Dept. of Cell Biology, University of Texas Medical Branch, USA. (Ph.D. 1995).
3. Dr. Poonam Yadav, Scientist, Dept of Pharmacology, Texas Southern University, USA. (Ph.D. 1994).
4. Dr. Jot Vyas, Principal, Birla Institute, Gwalior, India. (Ph.D. 1996).
5. Dr. Rakesh Trivedi, Principal, P.M.B. Gujarati Science College, Indore, India. (Ph.D. 1996).
6. Dr. Nisha Rathore, Scientist, Genentech, USA. (Ph.D. 1999).
7. Dr. Maneesh Jain, Assistant Professor, University of Nebraska, USA. (M.Sc. 1998).
8. Dr. Damodar Gupta, Scientist D, INMAS, DRDO, Delhi, India. (M.Sc. 1994).
9. Dr. Y. Ashok Babu, Scientist C, DRDE, Gwalior. (M.Sc. 2001)
10. Dr. K. Kumar Babu, Postdoctoral Fellow, Iowa, USA. (Ph.D. 2008).

A.23 Details of student enrichment programmes (special lectures / workshops / seminar) involving external experts:

1) Quiz and Essay Competitions are held every year from 2009 by the support of M. P. Council of Science and Technology, Bhopal.
2) Lectures were held on scientific topics by Senior Scientists. (Refer A.11)

A.24 Record and list of the teaching methods adopted by the faculty for different programmes: Usual teaching methods are through classroom lectures and by use of PPTs.

A.25 Record of monitoring by the department to ensure that programme objectives are constantly met and learning outcomes are monitored:

Programme objectives are monitored by:
1) Discussion with external examiners/ scientists visiting the Department.
2) The external examiners assess the course curriculum, course coverage, quality of question papers, and submit a report after each semester examination.

Learning outcomes are monitored by:
1) Class tests and semester examination.
2) Feedback forms from students.
3) Number of students passed GATE/ NET (refer A.14).

4) The number of students getting 1st division (84.6% for batch 2011-2013).
5) Number of students join research labs for Ph.D./PDF.

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

1) Students and faculty members participate in the sports activities held every year by the University.
2) Students participate in quiz and essay competitions held every year.
3) National Science Day is celebrated on 28th February every year. Seminars are conducted on the National Science Day by the support of MPCST, Bhopal. (Refer A.11)
4) Staff and students participate in Green Calendar 2013. Plantation around the Department was done on 06.08.2013 by students and Faculty members. As per Green Calendar various talks and other programs are held throughout the year in the University. School of Biochemistry shall organize talks on World Animal Day to be held on 04.10.2013.

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

(i) Participation in various conferences, seminars and lectures.
(ii) Number of M.Sc. students join Summer Training at various Institutions.

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

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

1) Department has so far taught approximately 600 students since inception in 1984-85 to date, who are serving the Nation in research, teaching, pharmaceutical and biotechnology industries.
2) Twenty two students have been awarded Doctorate degree from the Department since 1984; including 8 students who were awarded Ph.D. during 2008-2013.
3) A number of National seminars were organized by the Department (refer A.11).
4) Thirty five papers in reputed journals have been published in last 5 years.
5) The main areas in which significant contribution has been made by the Department are as follows.

(i) Tissue injury due to free radical generation and its importance in various clinical disorders.
(ii) Identification and role of nutraceuticals in toxicity
(iii) Role of membrane biology in health and disease
(iv) Photosynthesis and chlorophyll metabolism.
(v) Oxidative and salt stress in plants.

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

(i) To develop new collaborations and exchange program for students and Faculty members.
(ii) To submit new research proposals to various funding agencies.
(iii) Proposal to make new international collaborations for research.

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

Strengths:
(i) All Faculty members possess doctoral degree in the subject with long experience.
(ii) Publications in reputed journals by the Faculty members and research students.
(iii) Significant number of students qualify NET and GATE every year.
(iv) Meritorious students are admitted through entrance test.
(v) The matters related to curriculum such as course content, course coverage, quality of question papers and performance of students etc are discussed with the external examiners.

Weaknesses:
(i) The post of Reader (ST) (sanctioned during 8^{th} five year plan) and Professor needs to be filled.
(ii) UGC XI plan Faculty positions could not be recruited for need of sanction from Department of Higher Education, Government of M.P.
(iii) Faculty strength is only four due to which the Department is not eligible to apply for FIST and several other programmes for financial aids.

Opportunities:
(i) Appointment of Faculty members and fund allocation can provide more opportunities for progress of the department and initiate research in new areas.
(ii) To generate interest in biological sciences amongst youth.

Challenges:
(i) To make teaching-learning process at par with internationally reputed institutions.
(ii) To generate funds to develop research infrastructure.
(iii) To attract best talent in research and teaching.
(iv) To enable the students to compete nationally and globally.
(v) Burden of salaries, gratuity and pension on universities can affect the survival of universities.

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

Self analysis and feedback from students is practiced for quality sustenance and assurance. Strict adherence to academic calendar, quality teaching as well as active participation in research helps to develop quality. Numbers of workshops have been organized in university to promote quality in teaching learning process and in fostering excellence in research.

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: Yes [√] No [ ]

(i) Last update of syllabus and course plan was in 2011. Next plan is in 2013-14, before end of July 2013.
(ii) The curriculum designing has wide applicability to various disciplines, which require Biochemistry background.
(iii) To impart basic as well as advanced knowledge in the field through teaching and research.

1.1.1.A Eligibility for admission to each course:
(i) For M.Sc. (Biochemistry) course – Minimum 55% in B.Sc. with Biology subjects and Chemistry. Admission is through an entrance test.
(ii) For Ph.D. course – M.Sc. with 55% marks and admission through Doctoral Entrance Test.

1.1.1.B Whether reflects Vision and mission reflection: Yes [√] No [ ]

Vision: Highly competent Biochemists and internationally known scientists who are ethical, social and environment conscious.

Mission: To impart technical knowledge, practical skills, values, social and environmental consciousness in order to serve academia, industry and society.

1.1.1.C Write on reflection of vision and mission:
Faculty dedication for research and teaching reflect the vision and mission.

1.1.2 Details of process followed in last revision of Curriculum:
A. Need Assessment: Need assessment was based on the student feedback, advice of external experts and Faculty members of the department.

B. Faculty involved in curriculum design (List of members):
1. Dr. D. Bhatnagar
2. Dr. R. Gadre
3. Dr. Meeta Jain
4. Dr. S. M. Gokhale
5. Prof. A. Chaudhary

C. Records of Departmental Committees/Board approvals of the designed curriculum: (File 1.1.2.C)

D. Records of External Experts Opinion of the designed curriculum: (File 1.1.2.D)

E. Records of External Experts Feedback of the designed curriculum: (File 1.1.2.E)

F. Records of Student Feedback opinion on the existing curriculum: (File 1.1.2.F)

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: NET and GATE syllabus are kept in view when revising the syllabus. (File 1.1.2.G)

1.1.3 Detailed write up on each course in reference to:

* Employability
* Innovation
* Research

M.Sc. Biochemistry course:

Employability:
The course content provides good knowledge of biochemistry. The students get employment in pharmaceutical companies, and various research institutions.

Innovation:
The IV semester students have to join project work at various institutions for a period of about 6 months. During this period they get exposure to Institutions of repute. This provides an opportunity to work with other scientists.

Research:
M.Sc. course enables them to be good research students. Faculty members are actively engaged in research. A number of research papers have been published in national/international journals of repute. At present, 19 students are registered for Ph.D. under various Faculty members.

1.1.4 Records of UGC/AICTE/National Council, Regulating bodies Guidelines for the development and restructuring the curriculum, if any: (File 1.1.4)

Department Faculty members, if any, involved in leading any curricular reform which has created a national impact? Nil

1.1.5 A. Record of Interactions, Opinions and Feedbacks for the designed curriculum with External Research Bodies: Nil.

B. Records of Interactions, Opinions and Feedbacks for the designed curriculum with Industrial Experts, particularly in case of professional courses: The department interacts with the industry experts for curriculum design and development. Recently Dr. R.R.S. Chandravanshi, Technical Director, Harshvardhan Laboratories, Indore, gave us his suggestions regarding course curriculum.

C. Records of Interactions, Opinions and Feedbacks for the designed curriculum with Stake Holders, such as eminent personalities, visitors to the departments, parents:

The following scientists visited the Department on different occasions during the period Jan. 2012-June 2013. Their views on the designed curriculum, etc were recorded.

1) Dr. R.D. Makde – Scientific Officer-F, Raja Ramana Centre for Advanced Technology, Indore.
2) Dr. P.K. Goyal, Professor, School of Zoology and Biotechnology, Vikram Vishwavidyalaya, Ujjain.
3) Dr. P.K. Mishra, Scientist-E, Division of Translational Research, Tata Memorial Centre, ACTREC, Navi Mumbai.
4) Dr. B.N. Pandey, Scientific Officer-F, Radiation Biology and Health Sciences Division, Bhabha Atomic Research Centre, Trombay, Mumbai.
5) Dr. R.K. Singh, Principal Scientist, Indian Institute of Sugarcane Research, Raibareilly Road, Lucknow.

D. Records of Alumni opinion on the existing curriculum (may be taken in an Alumni Register):

(File 1.1.5 for B, C and D)

1.1.6 List of Department Courses which are also introduced in University affiliated colleges. List of colleges who introduced those courses: Yes, Mata Jijabai Girls P.G. College, Indore.

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

1.2 Academic Flexibility

1.2.1 List of courses taught in Department on campus: M.Sc. Biochemistry

1) Overseas programmes offered on campus: Nil
2) Programmes available for colleges to choose from: M.Sc. course is also running in one college.

1.2.2 Records on the following provisions with reference to academic flexibility

List of Core/ Elective options: All the subjects presently taught are core subjects.

1) List of enrichment courses: Nil
2) List of courses offered in modular form: Nil
3) List of courses/papers with credit accumulation and transfer facility: Nil
4) Details of Lateral and vertical mobility within and across programmes, courses and disciplines: Nil

1.2.3 Records of International students: Nil

1.2.4 Records of Courses developed targeting international students, if any: No

1.2.5 Record of dual degree and twinning programmes: Nil

1.2.6 A. List of students, admission process, fee structure of each programme:
B. Record of teacher qualification and salary parity and differences (if any) at par

with the aided programmes: All teachers are paid UGC scale basic pay, grade pay and M.P. Govt. allowances.

(File 1.2.6 for A and B)

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): Nil

1.2.9 Records of Departmental academic calendars of each semester: (File 1.2.9)

1.2.10 Records of Inter-disciplinary programmes, name of interdisciplinary programmes and details of students undertaken in those programmes: Nil

1.3 Curriculum Enrichment

1.3.1 A. Record of academic years in which each of the courses was revised: The course was revised in May, 2011, Next revision is in progress.
B. Records of review, up-gradation: New topics are reviewed and added to upgrade syllabus.
C. Records of social relevancy: Nil
D. Records of job orientation: Yes
E. Records of knowledge intensive nature of each course: The syllabus covers many topics of advance nature and imparts good knowledge to the students.
F. Records of meeting the emerging need of students: Curriculum meets the need of preparing students for CSIR / ICMR - JRF fellowship, NET and GATE examinations.
G. Records of meeting the emerging need of stakeholders: Curriculum meets the need of research laboratories and industry employing biochemists.
(File 1.3.1.A, B, D and E)

1.3.2 Details of the last four years during which how many new programmes at UG and PG levels were introduced: Nil
1) Inter-disciplinary
2) Programmes in emerging areas

1.3.3 A. Details of strategies adopted for the revision of the existing programmes: The upgradation of course is as per NET and GATE syllabus, students and experts feedback.

B. Percentage of courses underwent a syllabus revision in last four years: 100% (only M.Sc. Biochemistry course is run by the Department.)

1.3.4 A. Details of value-added courses offered: Nil
B. Details of these courses access to students: Nil

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): Nil

1.4 Feedback System

1.4.1 A. Copy of Feedback form to obtain feedback from students/student class representatives regarding the curriculum:

B. Details of action and use of feedback from students: Feedback is good. Strategies to further improve our programmes are made by Departmental Committee for curriculum, on teaching learning process and evaluation.
(File 1.4.1.A and B).

1.4.2 A. Methods used for eliciting feedback on the curriculum from national and international faculty: Feedback on curriculum from external examiners and other scientists are obtained.
B. Conducting webinars: Planned from 2013-14.
C. Curriculum development workshops:
(i) Prof. S.K. Tyagi, School of Education gave a talk on "How to make teaching student centric" on 10-05-2013.
(ii) Prof. (Ms.) Priti Rege, Dean (Academic), College of Engineering, Pune, delivered a talk on Choice Based Credit System (CBCS) on 15-05-2013.
D. Curriculum development online discussions: Planned in 2013-14.
E. Impact of workshop and discussions: Will be reflected in planned revision in 2013-14.

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: College Faculty are also member of Board of Studies, their suggestions for enrichment of the course are obtained at Board of Studies meeting.

1.4.4 What are the quality sustenance and quality enhancement measures undertaken by the Department in ensuring the effective development of the curricula?
(i)Meeting of Board of Studies are regularly held for curriculum quality enhancement.
(ii)The Faculty members are well qualified and experienced.
(iii) Interactions and feedbacks further enhanced the curriculum quality.

1.4.5 Any other information regarding curricular aspects which the UTD would like to include. Ordinance 31 gives academic autonomy to revise as and when the committee recommends upgradation.

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 2.1.1)

2.1.2 A. Write up details o f the process of admission put in place by the department:
Advertisement: First week of May

On-line application:	Last fortnight of June
Entrance test:	Last week of June
Counseling and admissions:	First week of July

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 criterion of admission to M.Sc. course is through entrance test. The student must have a minimum 50 % in graduation with chemistry as one of the subjects.
(File 2.1.2.B)

2.1.3 Details of admission process in the affiliated colleges if department is monitoring the same: As per merit keeping State Education Department guidelines.

2.1.4 Student profile analysis:
Year - 2011-13 (Total students: 25)

	SC	ST	OBC	General
Range of Pass % in PG degree	01/25	01/25	03/25	20/25

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

- SC/ST – given freeships and scholarships by State.
- OBC – given freeships and scholarships by State.
- Women – reservation 33% in each category.
- Persons with varied disabilities – Nil
- Economically weaker sections – Nil
- Outstanding achievers in sports and other extracurricular activities – The admission rules of State Government are followed to facilitate the access to PG course for above mentioned categories.

2.1.6 Number of students admitted in department in the last four academic years:
2009-10, 2010-11, 2011-12, 2012-13, 2013-14.

Category	Year 5 (2009)		Year 4 (2010)		Year 3 (2011)		Year 2 (2012)		Year 1 (2013)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
SC	01	01	01	---	02	---	01	01	01	03
ST	---	03	01	01	03	---	---	02	01	---
OBC	01	02	02	01	01	02	01	01	01	01
General	06	15	07	13	10	10	03	14	---	14
Total	08	21 (29)	11	15 (25)	16	12 (28)	05	18 (23)	03	18 (21)

2.1.7 A. Record of demand ratio for the various programmes of the university departments:

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG			
PG (2008-2012)	300 approx. / year	30	1:10
Integrated Masters			
M.Phil.			
Ph.D. (2012-13)	45	03	1:15
Integrated Ph.D.			
Certificate			
Diploma			
PG Diploma			
Any other (please specify)			

B. If yes, then highlight the significant trends explaining the reasons for increase/decrease: The applicants were normally 250-300 for 30 seats during 2008-2012. Demand ratio is 1:10 in 2008-2012 for PG, and 1:15 in 2012-13 for Ph.D. The number of applications for admission to M.Sc. Biochemistry course decreased in 2013-2014 and was only 65. This year, the trend for admission in Biological science courses has markedly decreased.

2.1.8 A. Record of any programme discontinued/staggered in the last four years: Nil

B. If yes, write-up of the reasons: N.A.

2.1.9 Record of Admissions:

Programmes / Year of admission	Total Number of admissions	Number of 1st division pass students in qualifying	Number of 2nd division pass students in qualifying	Entrance test Marks%	
				(Min)	(Max)
UG					
PG (2013-14)	24	22	02	5.4	58.6
Integrated Masters					
M.Phil.					
Ph.D. (2012-13)	3	3	Nil	25	90
Integrated Ph.D.					
Certificate					
Diploma					
PG Diploma					
Any other (please					

specify)					

2.2 Catering to Diverse Needs of Students

2.2.1 A. Record of organization of orientation/ induction programme for freshers: Induction programme was conducted for newly admitted students on 25.09.2012 at University level. Department level induction program is scheduled on Aug. 24, 2013. Orientation programme is scheduled by the University this year for 8 hours in Sept. 2013.

B. Details such as the duration, issues covered, experts involved and mechanism for using the feedback in subsequent years:
A programme, of about 4 hour duration was held where the issues of ragging, study, career prospects, information about the department and psycho-social aspects were covered.

2.2.2 A. Record of analysis of the "differential requirements of the student population" after admission and before the commencement of classes:
Differential requirements are soft skills, personality development and language skills. Students will be given communication skill classes during 15.7.2013 to 14.8.2013. Students will also be exposed to language laboratory in last fortnight of August, 2013.

B. Record of key issues identified and addressed. The issues such as communication skills, scientific interests, and career prospects were discussed.

2.2.3 A. Record of bridge/remedial/ add-on courses:
1) Scientific interest is generated by MPCST programmes.
2) Remedial classes this year will be taken for students showing poor performance in class tests.
3) Scientists from industries and research labs help the students through career counseling cell.

B. Time table and details of the courses offered in the department-wise for all courses:
Time table and course details will be made available by 15.07.2013 (File 2.2.3.B)

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

Number	Grade	Batch		
		2010-11	2011-12	2012-13
SC passed with	B	1	----	----
	B+	----	----	----
	A	----	1	----
	A+	----	----	----
ST passed with	B	1	1	1
	B+	2	----	----
	A	----	----	----
	A+	----	----	----
OBC passed with	B	2	2	1
	B+	1	1	1

	A	----	----	----
	A+	----	----	----

B. Main findings:
More attention is given to students who are slow learners and students from disadvantaged sections. It was observed that these students gained more confidence during the course and their performance also improved.

2.2.5 Record of identification and responses to the learning needs of advanced learners
These students were quick to learn and also took initiative in theory and experimental work. Due to their interest in the subject and more attentiveness, their performance in the exam was very good. These students passed CSIR-UGC NET, GATE, ICMR JRF exams etc. the record of which is available with the department. These students were advised and guided to pursue research at reputed institutions.

2.3 Teaching-Learning Process

2.3.1 Records of Plan and organization of the teaching, learning and evaluation schedules (teaching plan, evaluation schedules and methods, etc.).
The plan of teaching of each subject is provided to the students before the start of course. The schedule of class tests and the final semester exam is also provided during the course. (File 2.3.1)

2.3.2 A. Record and website info of providing course outlines and course schedules prior to the commencement of the academic session:
The syllabus and schedule of teaching is mainly in the same order as mentioned in syllabus.

B. Methods used for effective implementation.
The courses are taught during the assigned periods. Each of the Faculty member takes due care to complete the syllabus as scheduled. Extra classes are conducted when a difficult topic needs additional time.

2.3.3 A. Record of difficulties in completing the curriculum within the stipulated time frame and calendar
There are no difficulties in completing the curriculum as all the Faculty members stick to the plan and make sure that the course as well as the examination is completed as per the plan. The department is following semester system for 22 years, and it has been very successful. There is always completion of course and timely declaration of the results.

B. Write up of the challenges encountered and the departmental measures to overcome these.
Challenges encountered are mostly to teach slow learners, and to develop interest in the subject. The department helps the students by giving more practical exposure as well as by providing extra guidance.

2.3.4 A. Record of student-centric learning activities:
Students participate in many activities of the Department. Many seminars have been

organized in recent years in the Department mainly by the help of students. Students made all the arrangements and were actively involved in all these activities. Activities of the students are listed as follows: Summer-training projects, six months training projects in final semester, presentation of seminars by the students, and participation in university games and cultural events.

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.
One of the Faculty members has undergone Orientation and Refresher Course at Academic Staff College, DAVV. Most of the Faculty members of the Department have worked as resource persons and also as course coordinators. All the Faculty members guided students during their project work, and contribute to improve their research skills. Quizzes, joint projects and laboratory work, group discussions, soft skills and personality development, computer and language laboratory, student seminars and extension activities lead to holistic development.

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: (List and photograph enclosed). (File 2.3.5)

2.3.6 Record of Encouragement to blended learning by using e-learning resources
All the Faculty members use teaching aids and powerpoint presentation. The record of many presentations is available in the department. The CD's of video lectures, e-books, PPTs and web-resources will be placed in Departmental library. These will also be uploaded on website in 2013-14.

2.3.7 Record of facilities such as virtual laboratories, e-learning, open educational resources and mobile education used by the faculty for effective teaching:
The students are provided with central facility at the IT-Center of the University for e-learning. Open educational resources such as Pubmed, and large number of e-journals are also available. The M.Sc. students are provided with one semester course on Bioinformatics. The Ph.D. students are also provided with one semester course on Computer Applications to Biology, and another course on Biostatistics. Virtual classrooms are planned in 2013-14 in the University.

2.3.8 Record of activities of designated group among the faculty to monitor the trends and issues regarding developments in Open Source Community and integrate its benefits in the university's educational processes
Students from each batch and Faculty form a group ID and academic interactions are done using that. Student's difficulties are also known through group.

2.3.9 Record of steps taken to convert traditional classrooms into 24x7 learning places. Classrooms with internet, WiFi and LCD projectors provide 24x7 learning places. There are classrooms for each.

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

Seminar on various themes have been organized, many scientists from different areas have delivered lectures on various topics. The students interacted with the invited speakers about the subject.

Psychometric test of admitted students is planned in Oct. 2013. Experts will then provide psychometric counseling.

B. Details of the process and the number of students who have benefitted:
There were about 200 students and Faculty members in each seminar, who participated. (Please see section A.11 for list).
(File 2.3.10 for A and B)

2.3.11 A. Record of innovative teaching approaches/methods/practices adopted/put to use by the faculty during the last four years?
1) The Faculty members have adopted new visual teaching aids.
2) Experimental kits and instruments are provided to students to develop practical skills.
3) Virtual laboratories are planned from 2013-14.

B. Write up of improvement in learning by innovative methods:
The use of various kits and instruments helped the student to achieve technical proficiency. This also helped the students in better understanding of the subject. Use of internet, web resources, and e-books are other innovative methods used.

C. Record of recognition to the faculty due recognition for innovation in teaching:
1) Faculty members have published research papers in various reputed journals in their area of research.
2) Faculty members were awarded travel grant to attend international conference.
3) Virtual laboratory lessons on the web provides 24x7 learning place. Some virtual laboratory softwares are available for teaching.

2.3.12 Record of actions for creating a culture of instilling and nurturing creativity and scientific temper among the learners:
Students are encouraged for research based learning. The Faculty members discuss various issues related to creativity, and development of scientific thinking. MPCST seminars, competitions and Departmental student's projects instill and nurture creativity and scientific temper.

2.3.13 A. Record of student projects (if mandatory in each of the learning programme): (File 2.3.13.A)

B. Number of projects executed within the university: 30 (2012-13)

C. Names of external institutions associated with the University for Student Project Work: The students have worked for project in various institutes such as Delhi University, JNU, NII, IITs, CDFD, IGIB, NCCS, NCL, and NIV and many other Universities across the country.
(File 2.3.13.C)

D. Role of faculty in facilitating such projects:
Faculty members advise and facilitate the students to get opportunity at reputed institutes. The Faculty members also undertake few students for project work.

2.3.14 A. Record of shortfall in qualified faculty to meet the requirements of the curriculum: The department has 4 well qualified and highly experienced faculty members. Two faculty members are invited as visiting faculty in addition to teach Computer Applications to Biology and Biostatistics. There is no short fall of qualified Faculty members; however, more Faculty members will be of advantage.

B. Record of actions for shortfall supplementation: Additional Faculty recruitment is under process for 2013-14.

2.3.15 Number of percentage of faculty enabled to prepare computer-aided teaching/ learning materials: 100%, all the faculty members can prepare computer-aided teaching/ learning materials.

2.3.16 A. Record of Student feedback for evaluation of teachers by the students: (File 2.3.16.A)

B. Record of Alumni feedback for evaluation of teachers by the students: (File 2.3.16.B)

C. Methods used and Impact of the evaluation feedback used to improve the quality of the teaching-learning process:
The analysis for each Faculty member on the scale of 1-5 is assessed on the basis of feedback form. These issues are discussed in Departmental Faculty Meeting. The result of feedback analysis is placed on website of IQAC of University at the end of each semester.

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: Departmental Faculty took core courses. Guest and Visiting Faculty were invited for taking the applied courses on Biostatistics and Computer Applications.

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
Biochemistry	75	Nil	25	Nil

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.)? Nil

B. Number of faculty members appointed to teach new programmes during the last four years: Nil

2.4.5 List of academic recharge and rejuvenation of teachers:

A. List of faculty availed and provided research grants by the University: Nil, provision exists for Faculty to provide partial reimbursement of membership to international bodies. Provision also exists for Ph.D. supervisors to obtain reimbursement of internet charges.

B. List of faculty availed and on study leave: Nil

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

i) Dr. D. Bhatnagar was awarded Travel grant by UGC, New Delhi to present a research paper at the 14th International Congress of Radiation Research held at Warsaw, Poland from Aug 28- Sept 1, 2011.
ii) Dr. Meeta Jain was sanctioned travel grant by CSIR, New Delhi, MPCST, Bhopal and UGC, New Delhi to for paper presentation at the 5th International Congress of Chemistry and Environment, held at Port Dickson, Malaysia from May, 27-29, 2011.

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: Nil

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	1
HRD programmes	
Orientation programmes	1
Staff training conducted by the university	
Staff training conducted by other institutions	
Summer / Winter schools, workshops, etc.	

2.4.9 Percentage of the faculty that have

* been invited as resource persons in Workshops / Seminars / Conferences organized by external professional agencies : 100%
* participated in external Workshops / Seminars / Conferences recognized by national/ international professional bodies : 50 %
* presented papers in Workshops / Seminars / Conferences conducted or recognized by professional agencies : 50%
* teaching experience in other universities / national institutions and other institutions : Nil

* industrial engagement : Nil
* international experience in teaching : Nil

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:
(i) The Faculty members are members of Board of Studies for curriculum development.
(ii) One of the Faculty members is presently In-charge of Central Evaluation Centre.
Knowledge is managed by CD's and reports in Departmental library.

2.4.11 A. List of faculty encouraged
* Mobility of faculty between universities for teaching: Nil
* Faculty exchange programmes with national and international bodies: Nil

B. Record of schemes helping in enriching the quality of the faculty by such mobility and faculty exchanges: Nil

2.5 Evaluation Process and Reforms

2.5.3 A. Record of time taken by the department for declaration of examination results each semester: 2-3 weeks.

B. Record of means adopted for the mode / media adopted for the publication of examination results (Website, SMS, email, etc.). Notice board, grade sheets, website or group email ID's are used for result declaration.

2.5.4 A. Record of ensuring transparency in the evaluation process:
Students are shown their evaluated answer sheets, the question paper is discussed among the students and their deficiencies are also pointed out by each Faculty member. Best answer copy is also shown to all.

B. Measures taken to ensure confidentiality:
The Faculty members prepare the question papers and conduct the examination as per the time-table. The question papers are in the custody of the concerned Faculty members, who ensures confidentiality.

C. Record of the Pre-examination processes – Examination Time table generation, student list generation, Invigilators, Attendance sheet: (File 2.5.4.C)

D. Results of students course wise and its analysis:

M.Sc. Biochem (2011-13) (Total number of students: 25)

	Number of students with following grades							
	A+	A	B+	B	C+	C	D	F
M.Sc. (2011-13)	----	5	11	6	3	----	----	----

2.6. Student Performance and Learning Outcomes

2.6.1 A. Write up of articulation of its Graduate Attributes of the department:
At the completion of the graduation course, the students acquire the ability to think critically and develop scientific skills. They are qualified to serve in pharmaceutical industry, in research labs, as well as at higher educational institutes. They also become socially and environmentally conscious.

B. Record of facilitation to monitor the implementation and outcome: Implementation and outcomes are monitored by the Departmental committee.

2.6.2 A. Record of learning outcomes for its academic programmes:
Percentage of students getting first division in 2011-13: 88 %
A number of students passed UGC-CSIR NET/ GATE. Many students have joined research projects. Some of the students have joined industry. (File 2.6.2.A)

B. Record of making students and staff are made aware of these:
Placement profile is available on website. The present and past students of the Department have made an online association (sob_davv@yahoogroups.com) to remain connected.

2.6.3 Write up of department teaching, learning and assessment strategies structured to facilitate the achievement of the intended learning outcomes:
A timetable for teaching and practical classes is given to the students at the beginning of the semester. The timetable is posted on website also. The time table is strictly followed by teachers and students in order to cover the course and to provide practical knowledge about that subject to the students. Tests are conducted within a semester period, and a final semester exam is conducted at the end of the semester to judge the subject knowledge and writing skills of the students. Practical exams and related viva-voce are held at the end of the semester, to judge experimental skills of the students. Students of III semester present seminars on the allotted topics, while the IV semester students present the project work at the department.

2.6.4 Record of collection and analysis of data on student learning outcomes and use it to overcome the barriers to learning:
The record of the students who join different research and academic institutions for project work, assistantships or Ph.D. programme is available. (File 2.6.4)

2.6.5 Write up of new technologies deployed by the department in enhancing student learning and evaluation and how does it seek to meet fresh/ future challenges:
Teaching aids, such as LCD projectors are used to enhance student learning. Video lectures are planned for 2013-14. Evaluation process is by class tests within a semester. The answer books are shown to the students and question paper is discussed in the class for better understanding of the subject and to enhance ability of students to solve question papers. Practical based learning approach for students has been adopted, where students are given simple research problems, to improve their reasoning skill.

2.6.6 Any other information regarding Teaching, Learning and Evaluation which the department would like to include:
The Department has adopted semester grade point based system and has been granted academic autonomy / autonomation since last 22 years under university ordinance 31.

CRITERION III: RESEARCH, CONSULTANCY AND EXTENSION

III.1 Year-wises Publications in the department:

Year	No. of Publications
2009	03
2010	08
2011	10
2012	07
2013	07

1. Kumar K, Pujari N.S, Golegaonkar S.B, Ponrathnam S, Nene S.N, and Bhatnagar D (2009) Vinyl-2-pyrrodone derivatised guar gum based aqueous two-phase system. Separation and Purification Technology. 65, 9-13. ISSN 1383-5866, (Impact factor 3.525).

2. Kumar V, Rani A, Dixit AK, Bhatnagar D and Chauhan GS (2009). Relative changes in tocopherols, isoflavones, total phenolic content and antioxidative activity in soybean seeds at different reproductive stages. Journal of Agricultural and Food Chemistry 57, 2705-2710. ISSN 0021-8561, (Impact factor 2.906).

3. Kumar V, Rani A, Dixit AK, Pratap D and Bhatnagar D (2010). A comparative assessment of total phenolic content, ferric reducing-anti-oxidative power, free radical-scavenging activity, vitamin C and isoflavones content in soybean with varying seed coat colour. Food Research International, 43, 323–328. ISSN 0963-9969. (Impact factor 2.899).

4. Dixit AK, Bhatnagar D, Kumar V, Rani A, Manjaya JG, and Bhatnagar D (2010). Gamma Irradiation induced enhancement in isoflavones, total phenol, anthocyanin and antioxidant properties of varying seed coat colored soybean. Journal of Agricultural and Food Chemistry, 58, 4298–4302. ISSN 0021-8561, (Impact factor 2.906).

5. Yadav A S and Bhatnagar D (2010). Inhibition of iron induced lipid peroxidation and antioxidant activity of Indian spices and Acacia in vitro. Plant Food for Human Nutrition, 65, 18–24. ISSN 1573-9104. (Impact factor 2.463).

6. Azeez A, Aniruddha P. Sane, Tripathi SK, Bhatnagar D and Nath P (2010). The gladiolus *GgEXPA1* is a GA-responsive alpha-expansin gene expressed ubiquitously during expansion of all floral tissues and leaves but repressed during organ senescence. Postharvest Biology and Technology. 58, 48-56. ISSN 0925-5214. (Impact factor 2.310).

7. Kumar A, Kumar J, Khan ZA, Yadav N, Sinha V, Bhatnagar D and Khan JA (2010). Study of betasatellite from leaf curl disease of sunn hemp (Crotalaria juncea) in India. Virus Genes 41, 432-440. ISSN 0920-8569. (Impact factor 1.769).

8. Dixit AK, Kumar V, Rani A, Manjaya JG and Bhatnagar D. (2011). Effect of gamma irradiation on lipoxygenases, trypsin inhibitor, raffinose family oligosaccharides and nutritional factors of different seed coat colored soybean (Glycine max L.). Radiation Physics & Chemistry, 80, 597-603. ISSN 0969-806X. (Impact Factor 1.153).

9. Ritu Tyagi, Poonam Rana, Ahmed Raza Khan, D Bhatnagar, M. Memita Devi, Shubhra Chaturvedi, Rajendra P Tripathi and Subash Khushu (2011). Study of acute biochemical effects of thallium toxicity in mouse urine by NMR spectroscopy. J. App. Toxicol. 31, 663-670. ISSN 1099-1263. (Impact factor 2.597).

10. Tyagi R, Rana P, Gupta N, Khan AR, Bhatnagar D , Bhalla PJS, Chaturvedi S, Tripathi RP and Khushu S (2013). Differential biochemical response of rat kidney towards low and high doses of nickel chloride as revealed by NMR spectroscopy. J. Applied Toxicology 33,134-41. ISSN 1099-1263. (Impact factor 2.597).

11. Amit Kumar Dixit, Deepti Bhatnagar, Vineet Kumar, D. Chawla, K. Fakhruddin, D Bhatnagar (2012). Antioxidant potential and radioprotective effect of soy isoflavone against gamma irradiation induced oxidative stress. J. Functional Foods 4, 197-206. ISSN 1756-4646. (Impact factor 2.742).

12. Dixit AK, Bhatnagar D, Kumar V, Rani A, Manjaya JG, and Bhatnagar D (2012). Influence of gamma irradiation on in vitro lipid peroxidation and antioxidant properties of soybean with different seed coat color. International Journal of Food Properties 15: 1171-1181. ISSN 1094-2912. (Impact factor 0.877).

13. Deepti Dixit, Amit Kumar Dixit, Harsha Lad, PJS Bhalla, Deepak Bhatnagar (2012). Protective effects of *Terminalia chebula* in modulating oxidative damages against gamma irradiation induced lethality in rats. International Journal of Biological and Pharmaceutical Research, 3, 734-742. ISSN 0976-3651. (Impact factor 1.34).

14. Deepti Dixit, Amit Kumar Dixit, Harsha Lad, Damodar Gupta, Deepak Bhatnagar. Radioprotective effect of Terminalia chebula Retzius extract against γ- irradiation induced oxidative stress. Biomedicine and Ageing Pathology 3(2): 83-88 (2013). ISSN: 2210-5220.

15. Tyagi R, Rana P, Gupta M, Khan AR, M. Memita Devi, Bhatnagar D, Roy R, Tripathi RP and Khushu S (2012). Urinary metabolomic phenotyping of nickel induced acute toxicity in rat: an NMR spectroscopy approach. Metabolomics 8: 940-950. ISSN 1573-3882. (Impact factor 4.433).

16. Sinha V, Kumar A, Bhatnagar D and Khan JA (2013). Association of Cotton leaf curl Multan virus and its satellite molecules with leaf curl disease of papaya in India. New Disease Reports 27, 9. ISSN 2044-0588.

17. Jain M, Kaushal A, Gupta P and Gadre R (2009) Osmotic stress induced reduction in chlorophyll formation in bean leaf discs. J. Plant Sci. Res. 25, 55-59. ISSN 0970-2539.

18. Jain M, Tiwary S and Gadre R (2010) Sorbitol-induced changes in various growth and biochemical parameters in maize. Plant Soil Environ. 56, 263-267. ISSN 1214-1178. (Impact Factor 1.076).

19. Juliana S, Jain M and Gadre R (2011) Inhibition of δ-aminolevulinic acid dehydratase activity by cadmium in excised etiolated maize leaf segments during greening. Plant Soil Environ. 57, 332-337. ISSN 1214-1178. (Impact Factor 1.076).

20. Gupta P, Jain M, Juliana S, Gadre R (2013) Inhibition of 5-aminolevulinic acid dehydratase by mercury in excised greening maize leaf segments. Plant Physiol. Biochem. 62, 63-69. ISSN 0981-9428. (Impact Factor 2.976).

21. Kumar J, Gunapati S, Singh SP, Kumar A, Lalit A, Sharma NC, Puranik R and Tuli R (2013) A new betasetallite associated with cotton leaf curl Burewala virus infecting tomato in India : influence on symptoms and viral accumulation. Arch. Virol., ---- (DOI10. 1007/s00705-013-1613-y). ISSN 0304-8608. (Impact Factor 2.030).

22. Sharma S and Gokhale SM (2011) Solubility behavior of integral proteins and glycophorins of mammalian erythrocyte membrane. Asian J. Exp. Biol. Sci. 2, 449-454 ISSN 0975-5845.

23. Sharma S and Gokhale SM (2011) Sialoglycoproteins of mammalian erythrocyte membranes: A comparative study. Asian-Australian J. Anim. Sci. 24, 1666-1673. ISSN 1011-2367. (Impact factor 0.58).

24. Sharma S and Gokhale SM (2012) Differential actions of proteinases and neuraminidase on mammalian erythrocyte surface and its impact on erythrocyte agglutination by concanavalin A. Gen. Physiol. Biophys. 31, 457–468. ISSN 0231-5882. (Impact factor 1.192).

25. Sharma S, Zingde SM and Gokhale SM (2013) Identification of human erythrocyte cytosolic proteins associated with plasma membrane during thermal stress. J. Membrane Biology 246. ISSN 0022-263. (Impact factor 2.478).

26. Jain S, Jain M and Sharma CS (2010) Effect of yoga and relaxation techniques on cardiovascular system. Indian J. Physiol. Pharmacol. 54,183-185. ISSN 0019-5499

27. Jain S, Jain M and Sharma CS (2011) Changes in respiratory function and lipid profile due to yoga and relaxation techniques. Int. J. Pharmacol. Biol. Sci. 5, 79-84. ISSN 0973-6808.

28. Malviya P, Sai Prasad SV, Jain M and Gautam A (2012). Assessing grain yield and its components in durum wheat using canopy temperature as selection parameter under early heat stress conditions. Progressive Research 7, 122-126.

29. Jain M, Mittal M and Gadre R (2013) Effect of PEG-6000 imposed water

deficit on chlorophyll metabolism in maize leaves. J.Stress Physiol. Biochem. (In press). ISSN 1997-0838.

30. Z. Wang, A. S. Yadav, W. Leskova and N. R. Harris (2010) Attenuation of streptozotocin-induced microvascular changes in the mouse retina with the endothelin receptor A antagonist atrasentan. Experimental Eye Research, 1, 670-675. ISSN 0014-4835. (Impact factor: 3.259).

31. A. S. Yadav and N. R. Harris (2011) Effect of tempol on diabetes induced decreases in retinal blood flow in the mouse. Current Eye Research, 36, 456-461. ISSN 0271-3683 (Impact factor 1.513).

32. W. S. Wright, R. M. McElhatten, C. Busu, S. Y. Amit, Leskova, T. Y. Aw and N. R. Harris (2011) Influence of Glutathione on the electroretinogram in diabetic and non-diabetic rats. Current Eye Research, 36, 831-837. ISSN 0271-3683 (Impact factor 1.513).

33. Z. Wang, A. S. Yadav, W. Leskova and N. R. Harris (2011) Inhibition of 20-HETE attenuates diabetes induced decreases in retinal hemodynamics. Experimental Eye Research, 3, 108-113. ISSN 0014-4835 (Impact factor 3.259).

34. N. R. Harris, P. Carter, A. S. Yadav, M. N. Watts, S. Zhang, M. K. Davidson and M. B. Grisham (2011) Relationship between inflammation and tissue hypoxia in a mouse model of chronic colitis. Inflammatory Bowel Disease, 17, 742-746. ISSN 1536-4844 (Impact factor 4.855).

35. W. S. Wright, A. S. Yadav, R. M. McElhatten and N. R. Harris. (2012) Retinal blood flow changes following six months of hyperglycemia in the Ins2-Akita mouse. Experimental Eye Research, 98, 9-15. ISSN 0014-4835. (Impact factor 3.259).

III.2 Number of papers published in peer reviewed journals (national / international): Total 35, since 2009.

Monographs: Nil
Chapters in Books: Nil
Edited Books: Nil
Books with ISBN with details of publishers: Nil
Number listed in International Database (For *e.g.* Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.):
Citation Index – range / average: Total citations: 903 since 2008. Range: 0-247 for Dr. D. Bhatnagar.
Impact Factor – range / average: 3.0 for Dr. D. Bhatnagar.
h-index: 15 since 2008 for Dr. D. Bhatnagar.
i10 index: 20
Dr. A. S. Yadav
Impact Factor – range / average: 3.0 for Dr. A. S. Yadav

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

III.6 List and Record of Faculty serving in National committees b) International committees c) Editorial Boards d) any other (please specify):

1) Dr. D. Bhatnagar is Coordinator of M.P. Council of Science and Technology, Bhopal since 2008.

2) Dr. D. Bhatnagar is reviewer of following international journals:

BioFactors	ISSN no. 1872-8081
Cancer letters	ISSN no. 0304-3835
Food Research International	ISSN no. 0963-9969
Journal of Agricultural and Food Chemistry	ISSN no. 0021-8561
Chemico-Biological Interactions	ISSN no. 0009-2797
Food and Chemical Toxicology	ISSN no. 0278-6915
Plant Foods for Human Nutrition	ISSN no. 0921-9668

3) Dr. R. Gadre is the reviewer of "Indian Journal of Experimental Biology, ISSN No. 0975-1009".

III.7 Research thrust area recognized by funding agencies for the department:
Free radicals in biology and medicine, Toxicology, Effect of stress on chlorophyll metabolism and nitrogen assimilation in plants.

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:

	Projects from National Funding agencies:			
Year	Principal Investigator	Title	Funding agency	Amount (Rs.)
2009	Dr. D. Bhatnagar	Antioxidant and radioprotective effects of dietary constituents against gamma irradiation induced oxidative stress	UGC, New Delhi	8,71,800/-
2012	Dr. D. Bhatnagar	A study on antioxidative, antidiabetic and anti-inflammatory activity of herbal and natural products	MPCST, Bhopal	4,93,000/-
2009	Dr. M. Jain	Climate Change for National Environment Awareness Campaign 2008-2009	EPCO, Bhopal	8000/-
2010	Dr. M. Jain	Climate Change for National Environment Awareness Campaign 2009-2010	EPCO, Bhopal	7000/-

2010	Dr. M. Jain	Osmotic stress-induced changes on chlorophyll metabolism and antioxidative system in maize leaves	MPCST, Bhopal	3,90,000/-
2011	Dr. M. Jain	Biodiversity Conservation for National Environment Awareness Campaign 2010-2011	EPCO, Bhopal	8000/-
2012	Dr. M. Jain	Forests for Sustainable Livelihood for National Environment Awareness Campaign 2011-2012	EPCO, Bhopal	10,000/-
2010	Dr. S. M. Gokhale	Characterization of structural features and interactions of erythrocyte membrane proteins of some non-human mammals.	UGC, New Delhi	6,20,000/-
	Projects from International Funding agencies: Nil			

III.9 List and details of Inter-institutional collaborative projects and grants received:

a) All India collaboration: MOU for collaboration is not there, however, collaborative research work with the following scientists is under progress, the research work has resulted in joint publications:

1) Dr. Anita Rani, Principal Scientist, DSR, Indore.
2) Dr. Vineet Kumar, Senior Scientist, DSR, Indore.
3) Dr. Damodar Gupta, Scientist-D, INMAS, DRDO, New Delhi.
4) Dr. Poonam Rana, Scientist-D, INMAS, DRDO, New Delhi.
5) Dr. Sudha M. Cowsik, Professor, School of Life Sciences, JNU, New Delhi.
6) Dr. P.K. Singh, Sr. Scientist, NBRI, CSIR, Lucknow, U.P.
7) Dr. S. V. Sai Prasad, Principal Scientist, IARI Regional Station, Indore.
8) Dr. Vidhu. A. Sane, Principal Scientist, NBRI, CSIR, Lucknow, U.P.
9) Dr. Sribash Roy, Sr. Scientist, NBRI, CSIR, Lucknow, U.P.

b) International: Nil

III.10 List and details of Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, etc.; total grants received: UGC XI plan grant was as follows:

Infrastructure grant	10 lakhs.
Equipment grant	20 lakhs.
Faculty position grant	8 lakhs.
Books grant	2 lakhs.

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

- state recognition: Nil

- national recognition: Nil
- international recognition: Nil

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

The following are the members of the Departmental Research Committee:
Dr. S. Chand, Dean, Faculty of Life Sciences, DAVV.
Dr. D. Bhatnagar, Professor and Head, School of Biochemistry, DAVV.
Dr. R. Gadre, Professor, School of Biochemistry, DAVV.
Dr. S. M. Gokhale, Sr. Lecturer, School of Biochemistry, DAVV.
Dr. M. Jain, Sr. Lecturer, School of Biochemistry, DAVV.

B. Records of DRC regarding monitoring and addressing issues related to research: DRC selected Ph.D. candidates in Dec 2012. (File 3.1.1.B)

C. Record of DRC recommendations which have been implemented and their impact: (File 3.1.1.C)

3.1.2 Information of research centers in its affiliated / constituent colleges which are monitored by the DRC of the department:
i) Govt. Autonomous Holkar Science College, Indore.
ii) M.G.M. Medical College, Indore.

3.1.3 Details of the

* advanced funds for the sanctioned projects: Nil
* providing seed money: Nil
* Simplification of procedures related to sanctions / purchases to be made by the investigators: At present the whole process of sanctions, purchases and providing utilization certificates is extremely cumbersome. It takes years to get utilization certificate (UC) and subsequently there is delay in release of grants. It is due to lack of simple procedures, such as maintenance of ledger for each project. Preparation of UC can be simplified if each bill after audit is properly posted in the ledger.
* Autonomy to the principal investigator/coordinator for utilizing overhead charges: All grants including overhead charges are utilized as per the finance rules.
* Timely release of grants: Release of grants is often delayed because UC is not provided on time.
* Timely auditing: Auditing often takes very long time.
* Submitted utilization certificates to the funding authorities: Submission of utilization certificate is often delayed due to cumbersome procedures.

3.1.4 Record of interdisciplinary research promoted

- with other departments /schools of the university: Nil
- collaboration with national/international institutes/industries: Collaboration with Dr. Damodar Gupta, Scientist D, INMAS, DRDO, New Delhi resulted in publications related to radiation biology. (File 3.1.4).

3.1.5 Details of workshops/ training programmes/ sensitization programmes conducted by the department to promote a research culture on campus: A seminar was held on 15.01.2013 on "Fostering Excellence in Research". (File 3.1.5)

3.1.6 A. Details of visits of researchers of eminence to visit the campus as adjunct professors: Nil

B. Impact of such efforts on the research activities of the university: N.A.

3.1.7 A. Percentage of the total budget of the department which is earmarked for research: 20 %

B. Details of heads of expenditure, financial allocation and actual utilization: (File 3.1.7.B)

3.1.8 A. Details of University funded research and awarded Post Doctoral Fellowships/Research Associateships: Nil

B. List of students registered with record of source of funding by the university and other sources: Nil

3.1.10 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: Nil

B. Record of the output of these scholars: Nil

3.1.11 A. Details with photographs of national and international conferences organized: (File 3.1.11.A)

B. List highlighting the names of eminent scientists/scholars who participated in these events.

1) Dr. Vineet Kumar Sr. Scientist, Directorate of Soybean Research, Indore.
2) Dr. Anita Rani, Principal Scientist, Directorate of Soybean Research, Indore.
3) Dr. R.K. Bhargava, Ex Chairman, (Retd.) Heavy Water Board, Indore.
4) Dr. S.P. Singh, Professor and Head, School of Energy and Environmental Studies, DAVV, Indore.
5) Dr. Vijay Babu Gupta, Reader, School of Future Studies and Planning, DAVV, Indore.
6) Dr. Pradyumna Kumar Mishra, Scientist E, Division of Translational Research, Clinical Research Centre, Tata Memorial Centre, Advanced Centre for Training, Research and Education (ACTREC), Navi Mumbai 410210.
7) Dr. Jawaid A. Khan, Professor, Dept. of Biosciences, Jamia Millia Islamia University, Jamia Nagar, New Delhi 110025.

8) Dr. B. N. Pandey, Scientific Officer F, Radiation Biology and Health Sciences Division, Bhabha Atomic Research Centre, Mumbai 400085.
9) Dr. Om Prakash, Professor, Dept. of Biochemistry, Banaras Hindu University, Varanasi, U.P. 221005.
10) Dr. N. Shradha, Professor, TIFR, Mumbai.
11) Dr. G.K. Gupta, Principal Scientist, Directorate of Soybean Research, Khandwa Road, Indore.
12) Dr. N.K. Choubey, Scientist and Incharge, PIC, MPCST, Nehru Nagar, Bhopal 462003.
13) Prof. Ghayur Alam, Ministry of HRD Chair, Professor of IP Law, Chairperson, Centre of Science, Technology and Law, The National Law Institute University, Bhopal 462002.
14) Ms. Raunak Dubey, Executive, Intellectual Property Facilitation Centre, Confederation of Indian Industry, Indore, 452010.
(Refer File 3.1.5)

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: A seminar was organized by School of Biochemistry, DAVV, Indore, on the theme "Intellectual Property Rights" on October, 13, 2012. The seminar was sponsored by M.P. Council of Science and Technology, Bhopal. (File 3.2.2.A)

B. List of registered and accepted patents: Nil

3.2.3 Details of ongoing research projects of faculty:

	Year wise	Number	Name of the project	Name of the funding agency	Total grant received
A. University awarded projects: Nil					
Minor projects	---	---	----	---	---
Major projects	---	---	----	---	---
B. Other agencies - national and international (specify):					
Minor projects	---	---	----	----	---
Major projects	2012 to 2014	01	A study on antioxidative, antidiabetic and anti-inflammatory activity of herbal and natural products. PI: Dr. D. Bhatnagar	MPCST, Bhopal	Rs. 4,93,000/-
	2010	01	Osmotic stress-	MPCST,	Rs.

	to 2013		induced changes on chlorophyll metabolism and antioxidative system in maize leaves. PI: Dr. M. Jain	Bhopal	3,90,000/-

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: **N.A.**

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: UGC XI plan grant was as follows:

Infrastructure grant	10 lakhs.
Equipment grant	20 lakhs.
Faculty position grant	8 lakhs.
Books grant	2 lakhs.

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

1) Infrastructure and equipment grant has strengthened the research activities of the Department.

2) Book grant facilitated in upgrading the library.

3.2.6 List details of

A. Research projects completed and grants received (funded by National/International agencies):

	Projects from National Funding agencies:			
Year	Principal Investigator	Title	Funding agency	Amount (Rs.)
2009 to 2012	Dr. D. Bhatnagar	Antioxidant and radioprotective effects of dietary constituents against gamma irradiation induced oxidative stress. Project completed.	UGC, New Delhi	8,71,800/-
2009	Dr. M. Jain	Climate Change for National Environment Awareness Campaign 2008-2009. Project completed.	EPCO, Bhopal	8000/-
2010	Dr. M. Jain	Climate Change for National Environment Awareness Campaign 2009-2010. Project completed.	EPCO, Bhopal	7000/-
2011	Dr. M. Jain	Biodiversity Conservation	EPCO,	8000/-

		for National Environment Awareness Campaign 2010-2011. Project completed.	Bhopal	
2012	Dr. M. Jain	Forests for Sustainable Livelihood for National Environment Awareness Campaign 2011-2012. Project completed.	EPCO, Bhopal	10,000/-
2010 to 2011	Dr. S. M. Gokhale	Characterization of structural features and interactions of erythrocyte membrane proteins of some non-human mammals. Project completed.	UGC, New Delhi	6,20,000/-
	Projects from International Funding agencies: Nil			

B. Inter-institutional collaborative projects and grants received

i) All India collaboration: Collaborative research with following scientists is under progress, however, no grants have been received for collaboration:

1) Dr. Anita Rani, Principal Scientist, DSR, Indore.
2) Dr. Vineet Kumar, Senior Scientist, DSR, Indore.
3) Dr. Damodar Gupta, Scientist-D, INMAS, DRDO, New Delhi.
4) Dr. Poonam Rana, Scientist-D, INMAS, DRDO, New Delhi.
5) Dr. Sudha M. Cowsik, Professor, School of Life Sciences, JNU, New Delhi.
6) Dr. P.K. Singh, Sr. Scientist, NBRI, CSIR, Lucknow, U.P.
7) Dr. S. V. Sai Prasad, Principal Scientist, IARI Regional Station, Indore.
8) Dr. Vidhu. A. Sane, Principal Scientist, NBRI, CSIR, Lucknow, U.P.
9) Dr. Sribash Roy, Sr. Scientist, NBRI, CSIR, Lucknow, U.P.

ii) International: Nil

3.3 Research Facilities

3.3.1 A. Infrastructure in the department to facilitate research:

1) Research Labs 3
2) PG labs 2
3) Lecture Halls 2
4) Seminar Halls 3
5) Faculty rooms 4
6) Office 1
7) Departmental Library 1

B. Strategies have been evolved to meet the needs of researchers in emerging disciplines: Researchers are encouraged to avail facilities from national laboratories and seek grants from funding agencies.

3.3.2 A. Information and Resources catering to the needs of researchers of the department: Laboratory facilities for M.Sc. and Ph.D. students. Internet and INFLIBNET facilities

are provided.

B. Details of the facility: HPLC (Younglin instruments, Korea), UltraCentrifuge (Sorvall), High Speed Centrifuges (Sorvall RC5B and Remi), Spectrophotometers (Shimadzu, Japan), Water purifying syteme (Millipore) and distillation water plant, Cold room, Plant growth incubator, Laminar air flow, Electronic balances, Electrophoresis apparatus.

3.3.3 Record of University Science Instrumentation Centre (USIC) facilities been made available to research scholars: USIC provide help to repair instruments and glasswares.

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): Internet facility is available for all students/ Faculties in hostels and guest house.

3.3.5 Details of Uses of the Facilities of IUC, CAT, NRCS, IIT Indore and other specialized Research Centers for research:
1) M.Sc. students have done six month project training at CAT and NRCS.
2) Two Ph.D students are doing part of their research work at NRCS.

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: Nil

3.4.2 Details of publications by the faculty:

* Number of papers published in peer reviewed journals (national / international): Total 8 during 2012-13.
* Monographs: Nil
* Chapters in Books: Nil
* Books edited: Nil
* Books with ISBN with details of publishers: Nil
* Number listed in International Database (For *e.g.* Web of Science, Scopus, Humanities International Complete, EBSCO host, etc.):
* Citation Index – range / average: Total citations: 903 since 2008. Range: 0-247 for Dr. D. Bhatnagar.
* Impact Factor – range / average: 2.5 for Dr. D. Bhatnagar.
* h-index: 15 since 2008 for Dr. D. Bhatnagar.
* i10 index: 20 for Dr. D. Bhatnagar.
* Dr. A. S. Yadav
* Impact Factor – range / average: 3.0 for Dr. A. S. Yadav

3.4.3 Details of

* faculty serving on the editorial boards of national and international journals: Nil
* faculty serving as members of steering committees of international conferences

recognized by reputed organizations / societies: Nil

3.4.4 Details of

* Research awards received by the faculty and students:
  1) Inspire JRF fellowship from DST was awarded to Mrs. Deepti Bhatnagar in Jan, 2012.
  2) Mr. Jayesh Vaishnav was awarded 6 month fellowship from MPCST, Bhopal to work at any of the National Laboratories during 2013-14.
  3) Mrs. Swati Tiwary was awarded 6 month fellowship from MPCST, Bhopal to work at any of the National Laboratories during 2013-14.

* National and international recognition received by the faculty from reputed professional bodies and agencies:
  1) Dr. D. Bhatnagar was awarded Travel grant by UGC, New Delhi to present a research paper at the 14th International Congress of Radiation Research held at Warsaw, Poland from 28 Aug – 1 Sept 2011.
  2) Travel grant was sanctioned by CSIR, New Delhi, MPCST, Bhopal and UGC, New Delhi to Dr. Meeta Jain for paper presentation at the 5th International Congress of Chemistry and Environment, held at Port Dickson, Malaysia from 27th to 29th May, 2011.
  3) Dr. Meeta Jain was awarded life time fellow membership of International Congress of Chemistry and Environment (FICCE) during 2011.

3.4.5 A. Number of successful M.Phil. and Ph.D. scholars guided per faculty during the last four years:

	Ph.D. scholars
1) Dr. D. Bhatnagar	5
2) Dr. R. Gadre and Dr. M. Jain	1
3) Dr. S. M. Gokhale	1

B. University participate in Shodhganga by depositing the Ph.D. theses with INFLIBNET for electronic dissemination through open access: Yes

3.4.6 A. Record of Promotion of interdisciplinary research: Nil

B. Number of interdepartmental / interdisciplinary research projects undertaken: Nil

C. Mention the number of departments involved in such endeavours: Nil

3.4.8 List of University instituted research awards to the faculty of the Department: Planned in 2013-14.

3.4.9 Details of incentives given to the faculty for receiving state, national and international recognition for research contributions: Nil

3.5 Consultancy

3.5.1 Important consultancies undertaken by the department during the last four years: Nil

3.5.2 A. Department participation in university-industry cell: Nil

B. If yes, what is its scope and range of activities: N.A.

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

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:

1) 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.

2) Lecture on Swami Vivekanand's Contribution and Message to youth was held on Jan.12, 2013.

3) Bharat Ratna Dr. A.P.J. Abdul Kalam's message to University and college students on June 12, 2013.

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

1) Blood donation camps.
2) Cleanliness drive.
3) Green campus drive creates social outreach.

3.6.2 Promotion of neighborhood network and student engagement and holistic development of students and sustained community development:

1) Blood donation camps.
2) Cleanliness drive.
3) Green Calendar.

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:

1) Khan river cleanliness drive.

2) Plantation within the University was held on 05.08.2013 under green calendar policy 2013.

3.6.4 Records of tracking the students' involvement in various social movements / activities which promote citizenship roles:

1) Cultural programme is presented by the students on Independence Day every year.

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

1) Students learn to interact and work as a team during social activities.

2) Initiative such as green calendar has been able to inculcate environment consciousness among the students and Faculty members.

3) Various lecture series on Mahamana Madan Mohan Malviya and Vivekananda were held to inculcate moral and social values.

3.6.7 Department community in its outreach activities:

"Shram Daan" by the students of Department for cleanliness and plantation within the University.

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

3.7 Collaboration

3.7.1 A. MOU Copies and Record of collaboration with other agencies impacted the visibility, identity and diversity of activities on campus: MOU for collaboration is not there, however, collaborative research work with the following scientists is under progress:

1) Dr. Anita Rani, Principal Scientist, DSR, Indore.
2) Dr. Vineet Kumar, Senior Scientist, DSR, Indore.
3) Dr. Damodar Gupta, Scientist-D, INMAS, DRDO, New Delhi.
4) Dr. Poonam Rana, Scientist-D, INMAS, DRDO, New Delhi.
5) Dr. Sudha M. Cowsik, Professor, School of Life Sciences, JNU, New Delhi.
6) Dr. P.K. Singh, Sr. Scientist, NBRI, CSIR, Lucknow, U.P.
7) Dr. S. V. Sai Prasad, Principal Scientist, IARI Regional Station, Indore.
8) Dr. Vidhu. A. Sane, Principal Scientist, NBRI, CSIR, Lucknow, U.P.
9) Dr. Sribash Roy, Sr. Scientist, NBRI, CSIR, Lucknow, U.P.

B. Record of benefits academically and financially because of collaborations: The collaborations results in joint research publications. For list of joint publications please refer File 3.7.3.

3.7.2 Records of linkages resulted in

* Curriculum development: No
* Internship: Yes (File 3.7.2)
* On-the-job training: No
* Faculty exchange and development: No
* Research: Yes, a part of research experiments were performed at the collaborators lab. Joint work with scientists has resulted in joint research publications.
* Publication: Yes, collaborations resulted in joint research publications. Publications were in areas of effect of heavy metals on metabololomics, toxicology, plant physiology and plant virus pathology.
* Consultancy: No
* Extension: No
* Student placement: No
* Any other (please specify): Nil

3.7.3 A. Copy of MoUs with institutions of national/international importance/other universities/ industries/corporate houses etc.: MoU was not signed, however collaborative research helped in the award of Ph.D degree to some students, and resulted in joint research publications: (Name of students awarded Ph.D degree and joint research publications. File 3.7.3).

Following students were awarded Ph.D. under supervision of Dr. D. Bhatnagar.

1) K. Kumar Babu.
2) K. Sivashankar.
3) Amit Kumar Dixit.
4) Abdul Azeez.
5) Abhinav Kumar.

List of joint publications of Dr. D. Bhatnagar.

1. Kumar K, Pujari N.S, Golegaonkar S.B, Ponrathnam S, Nene S.N, and Bhatnagar D. Vinyl-2-pyrrodone derivatised guar gum based aqueous two-phase system. Separation and Purification Technology. 65, 9-13, 2009.

2. Kumar V, Rani A, Dixit AK, Bhatnagar D and Chauhan GS (2009). Relative changes in tocopherols, isoflavones, total phenolic content and antioxidative activity in soybean seeds at different reproductive stages. Journal of Agricultural and Food Chemistry 57, 2705-2710.

3. Kumar V, Rani A, Dixit AK, Pratap D and Bhatnagar D (2010). A comparative assessment of total phenolic content, ferric reducing-anti-oxidative power, free radical-scavenging activity, vitamin C and isoflavones content in soybean with varying seed coat colour. Food Research International, 43, 323–328.

4. Dixit AK, Bhatnagar D, Kumar V, Rani A, Manjaya JG, and Bhatnagar D (2010). Gamma Irradiation induced enhancement in isoflavones, total phenol, anthocyanin and antioxidant properties of varying seed coat colored soybean. Journal of Agricultural and Food Chemistry, 58, 4298–4302. ISSN 0021-8561.

5. Dixit AK, Kumar V, Rani A, Manjaya JG and Bhatnagar D. (2011). Effect of gamma irradiation on lipoxygenases, trypsin inhibitor, raffinose family oligosaccharides and nutritional factors of different seed coat colored soybean (Glycine max L.). Radiation Physics & Chemistry, 80, 597-603. ISSN 0969-806X.

6. Azeez A, Sane A P, Bhatnagar. D, and Nath P. Enhanced expression of serine proteases during floral senescence in Gladiolus. Phytochemistry, 68, 1352-1357, 2007.

7. Azeez A, Aniruddha P. Sane, Tripathi SK, Bhatnagar D and Nath P (2010). The gladiolus *GgEXPA1* is a GA-responsive alpha-expansin gene expressed ubiquitously during expansion of all floral tissues and leaves but repressed during organ senescence. Postharvest Biology and Technology, 58, 48-56.

8. Kumar A, Kumar J, Khan ZA, Yadav N, Sinha V, Bhatnagar D and Khan JA (2010). Study of betasatellite from leaf curl disease of sunn hemp (Crotalaria juncea) in India. Virus Genes 41, 432-440.

9. Ritu Tyagi, Poonam Rana, Ahmed Raza Khan, D Bhatnagar, M. Memita Devi, Shubhra Chaturvedi, Rajendra P Tripathi and Subash Khushu (2011). Study of acute biochemical effects of thallium toxicity in mouse urine by NMR spectroscopy. J. App. Toxicol. 31, 663-670.

10. Amit Kumar Dixit, Deepti Bhatnagar, Vineet Kumar, D. Chawla, K. Fakhruddin, D Bhatnagar (2012). Antioxidant potential and radioprotective effect of soy isoflavone against gamma irradiation induced oxidative stress. J. Functional Foods 4, 197-206.

11. Dixit AK, Bhatnagar D, Kumar V, Rani A, Manjaya JG, and Bhatnagar D. Influence of gamma irradiation on in vitro lipid peroxidation and antioxidant properties of soybean with different seed coat color. International Journal of Food Properties 15: 1171-1181(2012).

12. Deepti Dixit, Amit Kumar Dixit, Harsha Lad, PJS Bhalla, Bhatnagar D. Protective effect of Terminalia chebula in modulating oxidative damages against gamma-irradiation induced lethality in rats. Int. J. of Biological and Pharmaceutical Research 3(5): 734-742 (2012).

13. Tyagi R, Rana P, Gupta M, Khan AR, M. Memita Devi, Bhatnagar D, Roy R, Tripathi RP and Khushu S (2012). Urinary metabolomic phenotyping of nickel induced acute toxicity in rat: an NMR spectroscopy approach. Metabolomics 8: 940-950.

14. Deepti Dixit, Amit Kumar Dixit, Harsha Lad, Damodar Gupta, Deepak Bhatnagar. Radioprotective effect of Terminalia chebula Retzius extract against γ- irradiation induced oxidative stress. Biomedicine and Ageing Pathology 3(2): 83-88 (2013).

15. Tyagi R, Rana P, Gupta M, Khan AR, Bhatnagar D, Bhalla PJS, Chaturvedi S, Tripathi RP and Khushu S (2013). Differential biochemical response of rat kidney towards low and high doses of nickel chloride as revealed by NMR spectroscopy. J. Applied Toxicology 33(2):134-141.

Dr. R. Gadre:

1. Kumar, J., Gunapati, S., Singh, S.P., Kumar, A., Lalit, A., Sharma, N.C., Puranik, R. and Tuli, R. (2013) A new betasetallite associated with cotton leaf curl Burewala virus infecting tomato in India : influence on symptoms and viral accumulation. Arch. Virol. (DOI10. 1007/s00705-013-1613-y).

B. Record of enhanced research and development activities: Collaboration with other scientists have resulted in joint research publications in reputed journals. (File 3.7.3.B).

3.7.4 Have the University-Industry interactions resulted in the establishment / creation of highly specialized laboratories / facilities?: Task force has been set in 2012-13 for promoting University-Industry interactions.

3.7.5 Any other information regarding Research, Consultancy and Extension, which the university would like to include: Task force has been set for "Fostering Excellence in Research" with following members:

1) Dr. Anil Kumar.
2) Dr. K.K. Pandey.
3) Dr. Anand Kar.
4) Dr. Dinesh Varshney.
5) Dr. Pratibha Sharma.
6) Dr. R. K. Vyas.
7) Dr. P.K. Gupta.
8) Dr. Gyan Prakash.
9) Dr. Ajay Verma.
10) Dr. Anil Sharma.

CRITERION IV: INFRASTRUCTURE AND LEARNING RESOURCES

4.1 Physical Facilities

4.1.1 A. Details of Department physical infrastructure:
Laboratories and rooms: Research Labs-3, PG labs-2., Lecture Halls-2, Seminar Halls-1. Faculty rooms-4, Office-1, Departmental library-1.

Instruments/Equipments: HPLC (Younglin Instruments, South Korea), UltraCentrifuge (Thermo Fisher Scientific), High Speed Centrifuges (Sorvall RC5B and Remi), Spectrophotometers (Shimadzu, Japan), Water purifying system (Millipore) and distillation water plant, Cold room, Plant growth incubator, Laminar air flow, Electronic balances, Electrophoresis apparatus, Computers, Internet and INFLIBNET facility.

B. Maintenance of Laboratories for its optimal utilization: Yes.

C. Maintenance of Computers for its optimal utilization: The IT-Centre is providing full support for the functioning of Internet.

D. Maintenance of UPS's, Power Supplies: Electric power supply maintenance is looked after by the engineering section of the University. UPS's are maintained through annual maintenance contract.

E. Maintenance of support services, sanitation, first aid boxes: Sanitation and support services are provided by the University. Private persons are also hired for some of the services.

F. Maintenance of building, garden, indoor games structure: Maintenance of buildings is done by engineering section. Indoor games facility is maintained by the School of Physical Education.

4.1.2 Record of new initiatives for Infrastructure development to promote a good teaching-learning environment- Internet, Wi-Fi, Power Point Projectors, and Video Equipment:

Students and Faculty have access to computers and Internet facility within the Department and at the University IT-Centre. The classrooms and seminar halls are equipped with LCD projectors and Internet through nodes available at the Department.

4.1.3 Physical ambience for the faculty in terms of adequate research laboratories, computing facilities and allied services: All the Faculty members have a separate office room, and research laboratory. The Faculty members are provided with computers, printers and internet connection. The instruments are shared amongst the Faculty members and their Ph.D. students. Books, their CD's and e-journals are available at the department and at Central library.

4.1.4 List of Facilities like office room, common room and separate rest rooms for women students and staff: Woman Faculty members have separate office room. Separate rest rooms are available for woman staff and students.

4.1.5 List of the infrastructure facilities is disabled-friendly:
1) It is planned to build ramp in 2013-14.
2) Internet facilities for blind exist at I.T. Center.

4.1.8 Departmental special facilities are available on campus to promote students' interest in sports and cultural events/activities: Sports complex comprising of gymnasium, indoor court for table-tennis and badminton, play grounds with seating arrangements for outdoor games are available. Auditorium for cultural activities is available.

4.2 Library as a Learning Resource

4.2.1 Details of departmental library facilities: Departmental library has 780 books related to various aspects of biochemistry and biological sciences. (File: 4.2.1)

4.2.2 Provide details of the departmental library:

- Total area of the library (in Sq. Mts.): One room of 200 sq.ft. is available.
- Total seating capacity: 10
- Working hours (on working days, on holidays, before examination, during examination, during vacation): Open during the working days from 10.00AM – 6.00 PM.
- Layout of the library (individual reading carrels, lounge area for browsing and relaxed reading, IT zone for accessing e-resources): Nil
- Clear and prominent display of floor plan: Nil
- Adequate sign boards: Yes
- Fire alarm: Nil
- Access to differently-abled users: Nil
- Mode of access to collection: Manual.

4.2.3 Departmental library holdings:

a) Print (books, back volumes and thesis): 780 books, 20 Ph.D thesis, 50 M.Sc. dissertation thesis.
b) Average number of books added during the last three years: 200

c) Non Print (Audio Video, CDs, and Downloaded Articles): CDs of 20 books are available.
d) Electronic (e-books, e-journals): E-books and a number of e-journals are available through University's Central Library.
e) Special collections (e.g. text books, reference books, standards, patents): 464 Text books related to Biochemistry titles are available at central library. 780 text books are available at the Departmental library. Combining both gives ample number of books for students, researchers and Faculty.

4.2.4 Records of tools the library deploys to provide access to the collection

* OPAC: Available in University's Central library.
* Electronic Resource Management package for e-journals: Available in University's Central library.
* Federated searching tools to search articles in multiple databases: Available in University's Central library.
* Library Website: www.clib.dauniv.ac.in/
* In-house/remote access to e-publications: Available in the University's Central library and to UTD's. 463 e-journals are available. 10 journals are in print form.

4.2.5 Use of ICT deployed in the library

* Library automation: Planned in 2013-14.
* Total number of computers for public access: One
* Total numbers of printers for public access: Nil
* Internet band width speed: □ 2mbps □ 10 mbps □ 1 GB
* Institutional Repository: Available at the University's Central library.
* Content management system for e-learning: Nil
* Participation in resource sharing networks/consortia (like INFLIBNET): Yes

4.2.6 Details (per year) with regard to

* Ratio of library books to students enrolled: 30:1
* Average number of books added during the last four years: 300
* Assistance in searching Databases: Nil
* INFLIBNET/IUC facilities: Available

4.2.8 Annual departmental library budget and the amount spent for purchasing new books and journals: UGC grant 2011-12: 2,00,000/-
Spent: 2,00,000/-

4.3 IT Infrastructure

4.3.1 Details of Department IT and ICT Infrastructure: Each Faculty is provided with a personal computer system, connected to Internet. M.Sc. and Ph.D. students share computer facility that is connected to Internet resources. Students also have access to the University's IT-Centre.

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

- Number of systems with individual configurations: 4
- Computer-student ratio: 1:15

- Dedicated computing facilities: available at University's IT-Centre.
- LAN facility: Available through University's IT-Centre with 1 GBPS speed.
- Proprietary software: SPSS Statistics 17.0.
- Number of nodes/ computers with internet facility: 6
- Any other (please specify): Additional computer laboratories are also nearby at I.T. Centre. These are also accessible to the students.

4.3.3 Plans and strategies for deploying and upgrading the IT infrastructure and associated facilities: I.T. Infrastructure is excellent in the University. Campus is Wi-Fi connected.

4.3.4 Details on access to on-line teaching and learning resources and other knowledge and information database/packages provided to the staff and students for quality teaching, learning and research: Faculty and students have access to Internet, e-journals and books. CD's of most of the good books are available at the department and at the University's Central library. Classrooms and seminar halls are equipped with LCD Projectors.

4.3.5 IT facilities available to individual teachers for effective teaching and quality research: Text books, reference books and their CD's are available at Departmental or University's Central Library. e-journals are available through INFLIBNET. Classrooms and seminar halls are equipped with LCD projectors and Internet making it a 24x7 learning place.

4.3.8 A. Details of ICT-enabled classrooms/learning spaces available: 2 PG classrooms and 1 seminar hall connected to Internet and equipped with LCD projectors; 3 research labs connected to Internet.

B. Record of utilization for enhancing the quality of teaching and learning: Internet and LCD projectors has helped in presentation and understanding of the subject. Regular feedback from students has helped to develop quality curriculum and improvement in course design.

4.3.9 Records of Faculty and computer- aided teaching-learning materials: Faculty use power point presentations for teaching, lectures, and research work presentations. It is planned to upload PPT's on website during 2013-14.

4.3.10 Department availing of the National Knowledge Network connectivity: Yes

4.3.12 Record of Availing of web resources such as Wikipedia, dictionary and other education enhancing resources: Wikipedia, dictionary and other resources are used regularly.

4.3.13 Department budget for the update, deployment and maintenance of computers: Department budget not available. University and UGC support is used to update, deploy and maintain computers.

4.3.14 Details of plans envisioned for the gradual transfer of teaching and learning from closed university information network to open environment: There are plans for hosting PPT's in 2013-14 and course lectures in 2014-15 to provide open environment.

4.4 Any other information regarding Infrastructure and Learning Resources which the university would like to include: University has excellent infrastructure for learning through ICT since 2000, and N.K.N connectivity since 2012. Virtual classrooms are also planned from 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:

1) Faculty members encourage the students to clear their doubts.
2) There is a strong student-mentor relationship, and students are free to discuss about their problem with a Faculty member.
3) Anti-Ragging committee monitors the welfare of the students.
4) Orientation programme helps the new students to get familiar with the department and the University.
5) Mentors are allotted for a group of students in each class. The list is as follows:

Mentor	Course
Dr. D. Bhatnagar	(M.Sc. Biochem. Sem-III)
Dr. R. Gadre	(M.Sc. Biochem. Sem-III)
Dr. S.M. Gokhale	(M.Sc. Biochem. Sem-I)
Dr. M. Jain	(M.Sc. Biochem. Sem-I)

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

1) Apart from classroom, students get hands-on training in practical classes.
2) Students have to present a seminar on published research article, for which they are given grades.
3) Students have to complete a project work in different labs/ institutes during IV-sem.
4) Students are given a short problem to work on during a project, so that they develop their practical skills and thinking.
5) The students have to present their project work upon its completion.
6) Experts are invited to deliver talks in various seminars.

5.1.3 Record of department students 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:

1) Students get advice from the Faculty from time to time to enhance their learning, practical, and presentation skills.

2) Faculty and alumni students also suggest the current students about various academic, research and industry based job opportunities, and competitive exams held. Students get chance to interact with experts when seminars are organized.

3) Career counseling, opportunity cell and language laboratory help the students for career path identification.

5.1.4 Department publish its updated prospectus and handbook info annually on website and online access of course plans, syllabi and result: Yes

5.1.5 A. Records of the Timely dissipation of financial aid: The record is available with University.

C. Tables for type and number of scholarships/free-ships given to the students during the last four years the following categories: UG/PG/M.Phil/Ph.D./Diploma/others: (File 5.1.5.C).

Course	Type of Scholarship	Number of Scholarships in the years:			
		2009	2010	2011	2012
PG	SC	02	01	03	03
	ST	----	01	02	01
	OBC	03	01	02	02
----	----	----	----	----	----
Ph.D.	----	----	----	----	----

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: Nil

5.1.8 Department support services available for

* Students participating in various competitions/conferences in India and abroad: Yes.
* Physically challenged / differently-abled students: Internet facility for blind at I.T. Centre.
* SC/ST, OBC and economically weaker sections: Fellowship from M.P. Government is provided to SC, ST and OBC candidates. There is a separate coaching cell for minorities and SC/ST/OBC.
* Health centre, health insurance etc: Health Centre provides necessary medical treatment. The medical staff provides support to students and Faculty members at a specific time each day. Students staying at hostel contact doctors in emergency situations.
* Skill development (spoken English, computer literacy, etc.): Students have access to University's IT-Centre and English language lab. Students also have a course on applications of computers to biology in M.Sc. curriculum.
* Performance enhancement for slow learners: More attention is paid to slow learners and sometimes the Faculty members take extra classes also.
* exposure of students to other institutions of higher learning/ corporates/business houses, etc.: Students join summer training programme for 6 weeks. Students have to undertake project work for about 6 months as per the curriculum. The

students join various universities and central institutes/ laboratories to undertake the project work.

- publication of student magazines: Planned from 2013-14.
- Record of student participation in sports and extracurricular activities: Students of the Department participate in Annual UTD Sports Competitions.

5.1.9 Placement Records: Students have been placed in leading organizations, few example are as follows:

1. Dr. Vijay Maheshwari, Professor, Director, School of Life Sciences, North Maharashtra University, Jalgaon, India. (Ph.D. 1992).
2. Dr Shubhashish Sarkar, Sr. Scientist, Dept. of Cell Biology, University of Texas Medical Branch, USA. (Ph.D. 1995).
3. Dr. Poonam Yadav, Scientist, Dept of Pharmacology, Texas Southern University, USA. (Ph.D. 1994).
4. Dr. Jot Vyas, Principal, Birla Institute, Gwalior, India. (Ph.D. 1996).
5. Dr. Rakesh Trivedi, Principal, P.M.B. Gujarati Science College, Indore, India. (Ph.D. 1996).
6. Dr. Nisha Rathore, Scientist, Genentech, USA. (Ph.D. 1999).
7. Dr. Maneesh Jain, Assistant Professor, University of Nebraska, USA. (M.Sc. 1998).
8. Dr. Damodar Gupta, Scientist D, INMAS, DRDO, Delhi, India. (M.Sc. 1994).
9. Dr. Y. Ashok Babu, Scientist C, DRDE, Gwalior. (M.Sc. 2001)
10. Dr. K. Kumar Babu, Postdoctoral Fellow, Iowa, USA. (Ph.D. 2008).

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): Campus interview by companies are not held. Students have been placed in different companies off-campus.

5.1.11 A. Record of registered Alumni Association: Alumni association of Biochemistry students is on Internet.

B. Record of activities and contributions to the development of the department: Alumni members post their suggestions, guidance and job openings on the alumni group (sobiochem_davv@yahoogroups.co.in).

C. Record of alumni meets: Planned in 2013-14.

5.1.12 A. Committee members and record of student grievance redressal: The departmental committee is also functioning as Student Grievance Redressal Committee. There are no complaints of student grievances at present.

B. Details of the nature of grievances reported and the redressal: There are no complaints or student grievances at present.

5.1.13 A. Record of anti-ragging committee: Members of the anti-ragging committee are as follows:

1) Dr. D. Bhatnagar. 2) Dr. R. Gadre.
3) Dr. S. M. Gokhale. 4) Dr. M. Jain.

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

5.1.14 Details of the cooperation rendered by parents, industry and its stakeholders to ensure the overall development of its students: Parents are informed if the student's behavior and performance are not up to the mark.

5.1.18 A. List of participation of women students in intra- and inter-institutional sports competitions and cultural activities: Women students also participate in the annual sports activity. Women students have also participated in essay and quiz competitions held by the support of MPCST, Bhopal. List of some of the participants is as follows:
1) Anita Bahetwar
2) Dipti Unnikrishnan
3) Anjali Singh
4) Pallavi Singhal
5) Priyanka Solanki
6) Deepti Dixit
7) Harsha Lad

B. List of participation of women students in intra- and inter-institutional sports competitions and cultural activities: List of participants is as above.

5.2 Student Progression

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

Student Progression	%
UG to PG*	50%
PG to M.Phil.*	N.A.
PG to Ph.D.	33%
Ph.D. to Post-Doctoral	Nil
Employed • Campus selection • Other than campus recruitment	 Nil 50%

5.2.2 Programme-wise pass percentage during the time span stipulated: 100%

5.2.3 Records of Number and percentage of students who appeared/qualified in examinations like UGC-CSIR-NET, UGC-NET, SLET, GATE / CAT / GRE / TOFEL / GMAT / Central / State services, Defense, Civil Services, etc.: Refer A-14.

5.2.4 List category-wise with details regarding the number of Ph.D./D.Litt./D.Sc. thesis submitted/ accepted/ resubmitted/ rejected in the last four years (2009-13):
Number of Ph.D. awarded: 7
Thesis submitted: 1

Accepted:	Nil
Resubmitted:	Nil
Rejected:	Nil

5.3 Student Participation and Activities

5.3.1 A. List the range of sports, cultural and extracurricular activities available to students: Badminton, Football, Volleyball, Cricket, Table Tennis, Chess, quiz, dance, drama and singing competitions at college / university levels.

B. Sports and extracurricular calendar and details of students' participation: (Annexure 5.3.1)

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: Nil

5.3.3 A. Gathered data and feedback from pass-out graduates: Yes

B. Gathered data and feedback from employers: Nil

C. Use of the data for the growth and development of the department: Yes

5.3.4 Department special drives / campaigns for its faculty and students to promote heritage consciousness: Plan to visit Ralamandal, Holkar Chattris, Lalbag Palace, Central Museum and video films to promote heritage consciousness in 2013-14.

5.3.5 A. Records of Department involvement and encourage its students to publish materials like catalogues, wall magazines, departmental magazine, and other material: Nil

B. List the major publications/ materials brought out by the students during the last four academic sessions:
1) In the year 2012-13, one student have published research paper in international journal.
2) Two students have published research work in college journal.
(File 5.3.5.B).

5.3.6 A. Departmental Student and Alumni association or any other similar body: Alumni association of biochemistry students is on internet. [sobiochem_davv@yahoogroups.co.in]

B. Details on its constitution, activities and funding: Nil

5.3.7 Details of student representatives in Board of Studies, various academic and administrative bodies: One student member is nominated on merit basis to the Board of Studies in Biochemistry.

5.3.8 Any other information regarding Student Support and Progression which the university would like to include:

1) Availability of Internet and Wi-Fi campus and hostel is a big support to the students.

2) Lectures on Mahamana Madan Mohan Malviya and Vivekananda have inculcated social values amongst students.

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: Highly competent Biochemists and internationally known scientists who are ethical, social and environment conscious.

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: Mission: To impart technical knowledge, practical skills, values, social and environmental consciousness in order to serve academia, industry and society at large.

6.1.3 Write-up of

* Ensuring the organization's management system development, implementation and continuous improvement: Efforts are made to improve quality in teaching, research and administrative work. Participation of Faculty members in these areas is always encouraged. Various matters are discussed in the Departmental committee. The Departmental Purchase Committee as well as the Central Purchase Committee is involved in matters of purchase.

* Interacting with its stakeholders: The Faculty members interact with the students and guide them to improve the performance. More care is taken for students having poor performance in studies. Parents are informed, if necessary.

* Reinforcing a culture of excellence: Students are always encouraged for hard and honest efforts in examinations, seminars, practicals and projects they undertake. The Faculty members advise students for joining reputed research labs nationally and internationally for Ph.D. or for postdoctoral training. Seminars/ invited talks are organized by the department to provide more opportunities to the students by interacting with various scientists. Similarly, the university administration encourage the Faculty members for research, publications, attend seminars/ workshops nationally or internationally, and take sabbatical leave for keeping themselves abreast of the latest trends in research and teaching.

* Identifying organizational needs and striving to fulfill them: Need is to have good quality research and teaching. The department is able to fulfill these needs by providing quality teaching and research facalities.

6.1.4 Records of Departmental and other committees meetings: Departmental meetings are frequently held. Most of the matters are discussed in the Departmental meetings. (File 6.1.4)

6.1.6 Write-up of a culture of participative decisions in the department: Departmental matters are discussed in the Departmental committee. The Departmental committee constitute of all the four Faculty members. Similarly, Departmental purchase committee also includes all the Faculty members. All academic and purchase related matters are discussed in these committees. In some matters such as, examination schedule etc., students consensus is also taken into consideration.

6.1.7 Record of grooming leadership at various levels: Faculty members are assigned work as class coordinators. Student representatives are also elected. Leadership qualities and other matters related to grooming of students and to become a better citizen are discussed on certain occasions.

Faculty members undergo various training programmes, such as orientation and refresher courses. Also, Faculty members undertake research and publish research papers in reputed journals. Experience also helps Faculty members to become a good teacher and researcher. Various workshops are also held by the university to improve quality teaching and writing skills.

6.1.10 Record of knowledge management strategy: The research work and project work of the students is placed in the library. Books and journals are available to students from Departmental and Central library.

6.1.11 Write up on

* Contributing to national development: The Faculty members and students work in coordination, so that the students get a good understanding about the fields related to biology. Faculty members emphasize students on the hard work by ethical means to achieve their professional goals. Various students are doing excellent job in industry and in research nationally and globally. Our own research at the department, related to oxidative stress in pesticide toxicity, carcinogenesis, soil salinity, and plant chlorophyll metabolism is relevant to India and internationally.

* Fostering global competencies among students: Students get admission to the course by a national level entrance test. They are always encouraged to work hard, and develop a strong understanding in biological sciences, so that they can enter a reputed institution either in academia or industry. Students are advised depending on their caliber, and trained for thinking rationally and scientifically. Seminars are organized where experts in the respective fields deliver talks. University also has a Career Guidance Cell to motivate and give professional guidance to students.

* Inculcating a sound value system among students: Students are advised and encouraged to adopt right means to achieve the goals. Ethics and inculcation of value system among the students and society at large are discussed.

* Promoting use of technology: M.Sc. and Ph.D. students have to undertake a course on "Application of computers to biology" to acquire knowledge about computers and to

encourage them to use computers in biological sciences. In addition students have to study course on "Biostatistics". M.Sc. students are encouraged to take project work at various national laboratories, so that they get a good exposure to new techniques in the field of biology. Similarly, Ph.D students are encouraged to use sophisticated instruments at National laboratories for their research work, if required.

* Quest for excellence: Our goal is to impart quality education to students. To achieve this students are taught by experienced Faculty members. Interaction with the students in the class as well as by way of feedback, the Faculty tries to improvise on the course curriculum and other facilities.

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: Efforts are always made to achieve the goals, and to provide better facilities to the students and Faculty members. Various issues are discussed with the Faculty members and the students if required to the advantage of all concerned.

* Enhancing Teaching and learning: The Faculty members attend orientation and refresher courses as well as workshops on quality issues to improve teaching and learning process. The interaction with students and the efforts of the Faculty members help to enhance the teaching and learning process.

* Enhancing Research and development: Faculty members are encouraged to obtain grants for research and to publish research work in reputed journals. Research work is presented at various conferences by the Ph.D. students and Faculty members.

* Enhancing Community engagement: Students undertake activities such as cleaning of campus, plantation etc.

* Enhancing Human resource planning and development: Faculty members and university employees are appointed as per the Govt. of M.P. guidelines.

* Enhancing Industry interaction: Some of the students are appointed in the industry. Efforts will be made to collaborate with industry to enhance innovative research.

* Enhancing Internationalisation: Attempts will be made for international collaboration in research areas.

6.2.2 Departmental organizational structure and decision making processes and their effectiveness: All the Faculty members are members of the Departmental committee as well as Purchase committee. Various matters are discussed in these committees before decision making process.

6.2.3 Write up of functioning independently and autonomously and ensure accountability: The decisions at the Departmental level are taken after discussions at the Departmental committee meetings. These matters include preparation of time table,

conduct of examination and purchases up to a limited amount. However, matters related with the University are implemented after proper sanction etc.

6.2.5 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: No case has been filed against the Department.

6.2.6 Performance audit of the department by external experts: The external experts are requested to assess the performance of the Department. Performance audit was conducted on 28/01/2012 by two experts. Similarly, the performance was assessed by one external expert on 15/04/2013. Comments on the performance of the students, quality of question papers and other curriculum related matters are also obtained by the external experts who visit the Department for examination. (Annexure 6.2.6)

6.3 Faculty Empowerment Strategies

6.3.1 Outcome of the reviews of self appraisal and PBAS and important decisions taken on that: Self appraisal and PBAS reports are sent to the university. The decisions on these reports are taken by the University.

6.3.3 List of teachers availing welfare schemes available for teaching and non-teaching staff: Nil

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

6.3.5 Gender audit during the last four years of the department achievements and pass percentages and its salient findings: N.A.

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: The student fee was collected by the Department up to 2011 and the account was audited. However, now the fee is collected by the University and accounts are maintained at the university.

6.4.5 Efforts taken by the department for resource mobilization: Funds are available to the Faculty members through research grants. Funds are also provided by MPCST, Bhopal to conduct programmes such as quiz, essay competitions etc., for the students. Funds are also made available from EPCO for plantation etc.

6.4.6 Record of endowment funds created: Endowment funds are created at the University and records are maintained by the University.

6.5 Internal Quality Assurance System

6.5.1 Details of department internal quality assurance and sustenance system, give details: Feedback from students is taken to assess the teaching methods and quality. Students are shown the evaluated examination answer books. The question paper is discussed in the class. The course teacher may make any changes if required in the evaluated answer book. This also resolves any problem among the students related to evaluation process.

6.5.2 Internal workshops to improve teaching, learning and evaluation: Seminars and workshops on internal quality assurance are held by the University.

6.5.3 Record of continuously review the teaching learning process: The Departmental meeting reviews matters related to time table, conduct of examination, evaluation of answer books, declaration of results, preparation and distribution of grade cards etc. (Annexure 6.5.3)

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

CRITERIA VII: INNOVATIONS AND BEST PRACTICES

7.1 Environment Consciousness

7.1.1 Department Area Green Audit details: Nil

7.1.2 Departmental initiative to make the campus eco-friendly?

* Energy conservation
* Use of renewable energy
* Water harvesting
* Check dam construction
* Efforts for Carbon neutrality
* Plantation: Plantation around the Department has taken on various occasions.
* Hazardous waste management
* e-waste management
* any other (please specify)

7.2 Innovations

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

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:

1) Excellence in Research and teaching

2) Maintenance of academic schedule including examination and declaration of results.

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)?

The objectives and the intended outcomes of the above best practices are mainly to encourage research activities. Attempts are made to improve research facilities and to provide an environment to support quality research. The students are provided facilities so that they can achieve their targeted goals. Strict compliance of the academic schedule including day to day classes of the students, class tests and final examination,

as well as declaration of results has helped the students to achieve academic excellence. Due to these practices, the students become more academically competitive and aware of various opportunities for their growth and success.

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)?

It is a big challenge to be excellent in research. Funding and infrastructure including instrumentation is very essential for quality research. Faculty members have obtained research funding from various agencies as well as the UGC plan grant has supported the Department in research activities. However, more funding for research activities is always required to upgrade the existing facilities.

The Department has been able to strictly follow the academic calendar. The University is following semester system for the last about 20 years, and the responsibility of conducting exam and declaring result is of the Department. Due to this practice academic calendar is followed properly which has given good results.

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)?

Quality research by the students and Faculty members has resulted in research publications in journals of high repute. The research projects of the Faculty members have also helped to achieve higher academic standards. In the context of higher education in India, it is essential to have trained manpower and to provide satisfactory funding for research. The funding to the State Universities is quite low as compared to Centrally funded Institutions. On the other hand, there are large number of students and Faculty members in the State Universities who are inadequately supported for research.

Academic excellence in the Department has been achieved mainly because of implementation and monitoring of targeted goals. The students have also contributed to a larger extent in maintaining discipline and academic schedule, which has resulted in overall academic growth.

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.

Due to the constant efforts of the students and the Faculty members, the Department has been able to achieve its goals. The alumni of the Department have been performing excellently in India and abroad. The success and excellence in performance has resulted in quality research and publications in journals of high repute.

6) Problems Encountered and Resources Required

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

For maintaining academic and research standards, continuous efforts by all the Faculty members and administration are required. Resources and trained manpower is essential for maintaining academic and research standards.